santhera Pharmaceuticals

Advancing Mitochondrial Medicine

Thomas Meier, CEO

Ordentliche Generalversammlung
Basel, 4. April 2017

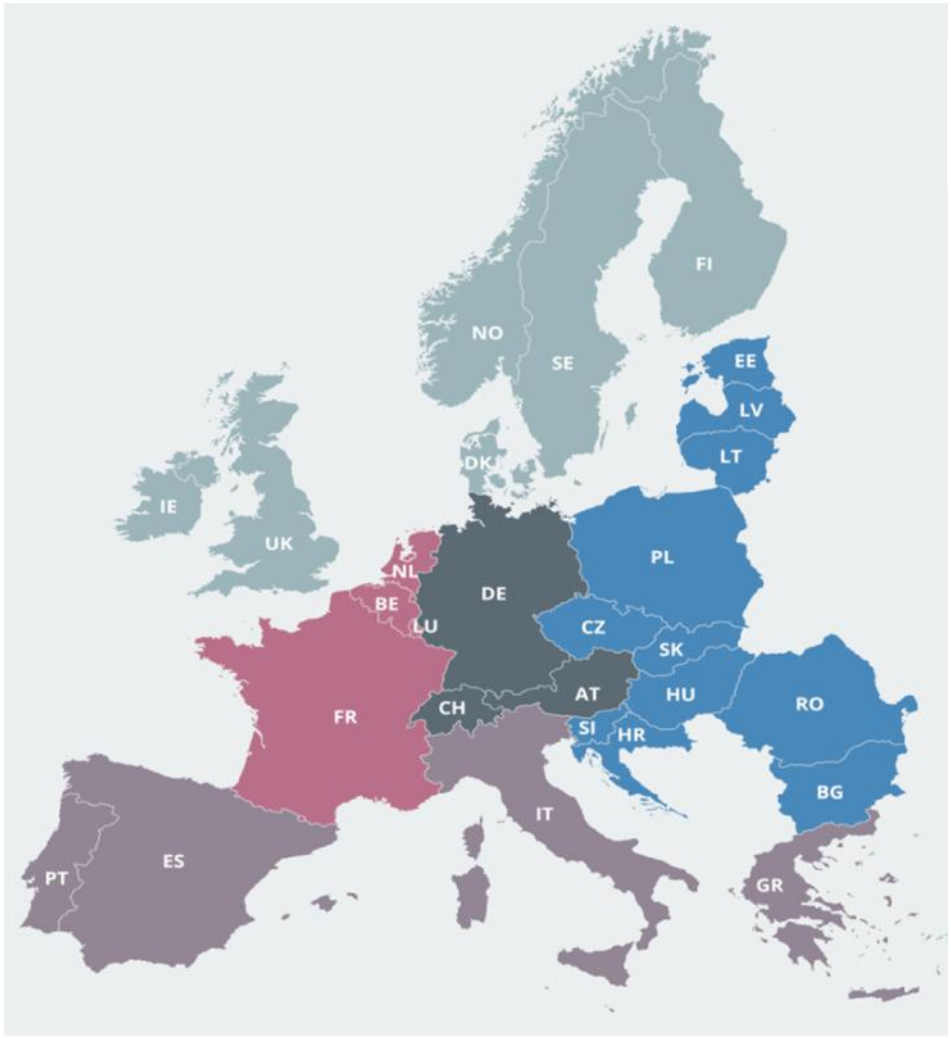
First full year as commercial company in EU

RAXONE®

Eine neue Perspektive
für Patienten mit LHON

- **Sales in 2016: CHF 19 million**
- **2016: Raxone® sold in 15 countries, sales primarily in FR and DE**
- **Sales target for 2017: CHF 21-23 million**

Successful European Launch of Raxone®



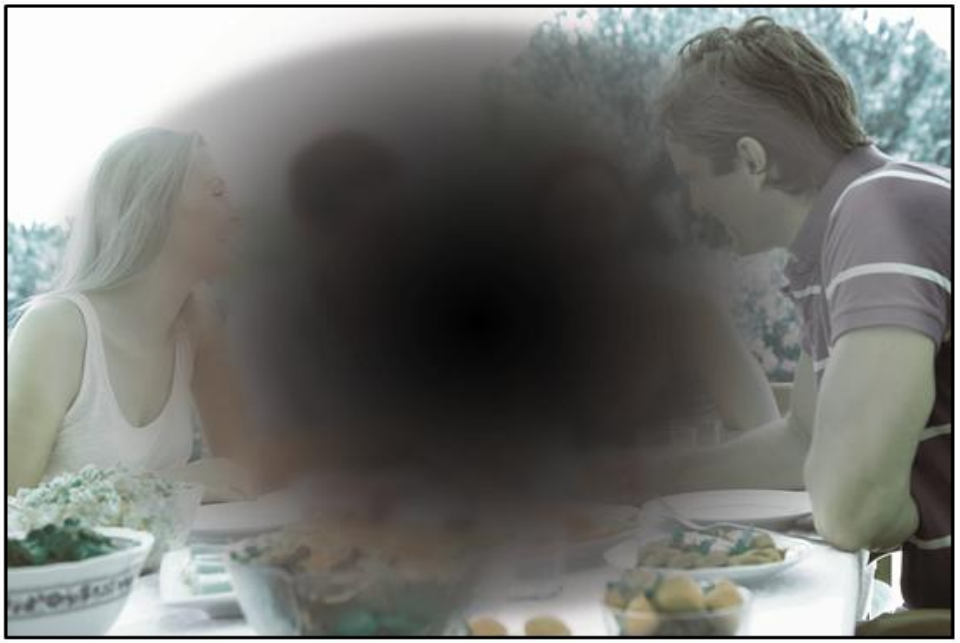
Raxone
idebenone

EUROPEAN MEDICINES AGENCY
SCIENCE MEDICINES HEALTH

- Raxone®: EU approval for patients with LHON (first approved medication)
- Commercial presence in 4 regional clusters (western Europe)
- Distribution partner Ewopharma for eastern European countries
- Headcount commercial team: ~ 40

Leber's Hereditary Optic Neuropathy (LHON): the clinical presentation

Normal vision



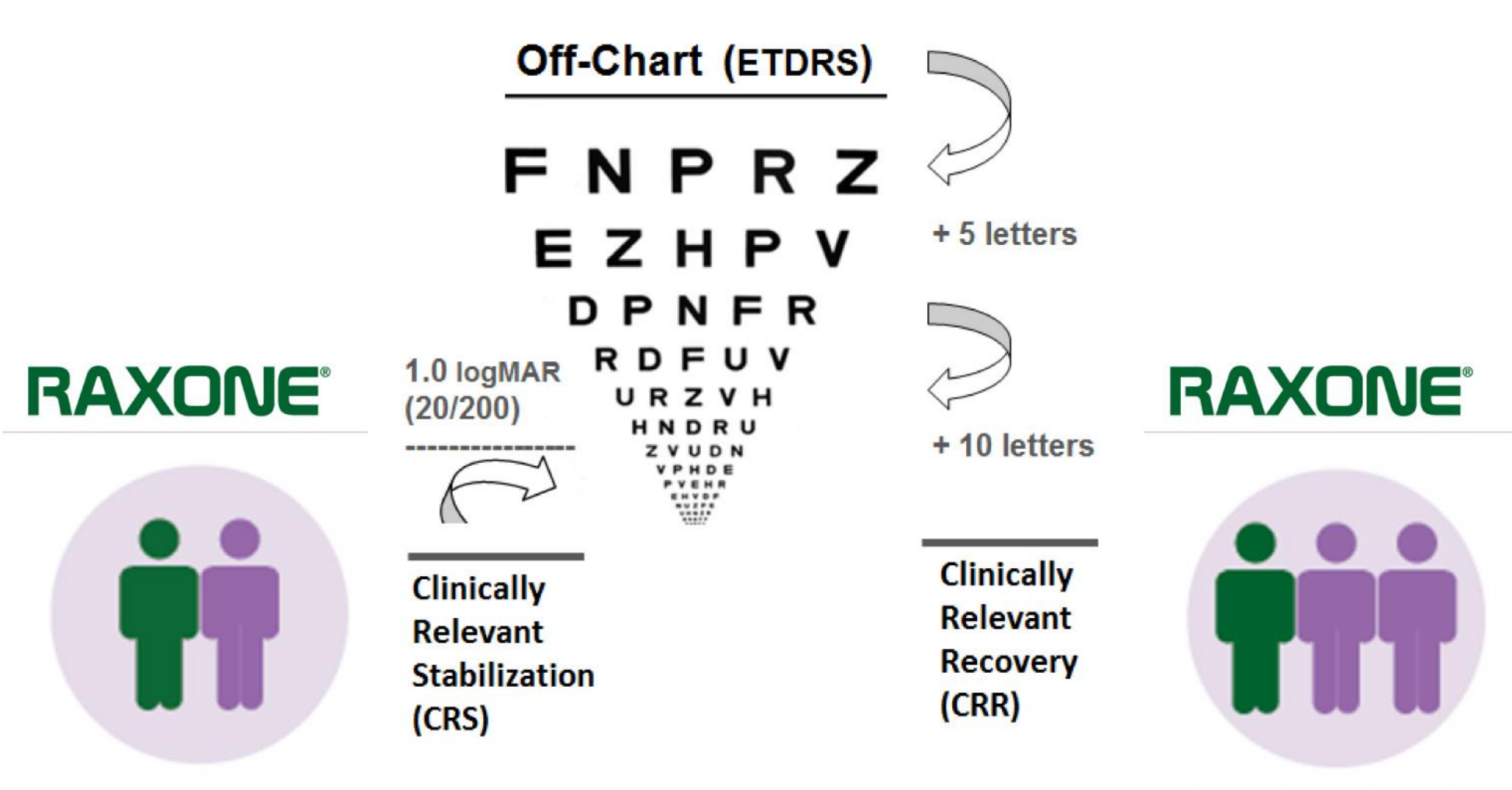
Vision due to LHON

Days, weeks or few months

Santhera's LHON Ambassador: Fabrizio Sottile

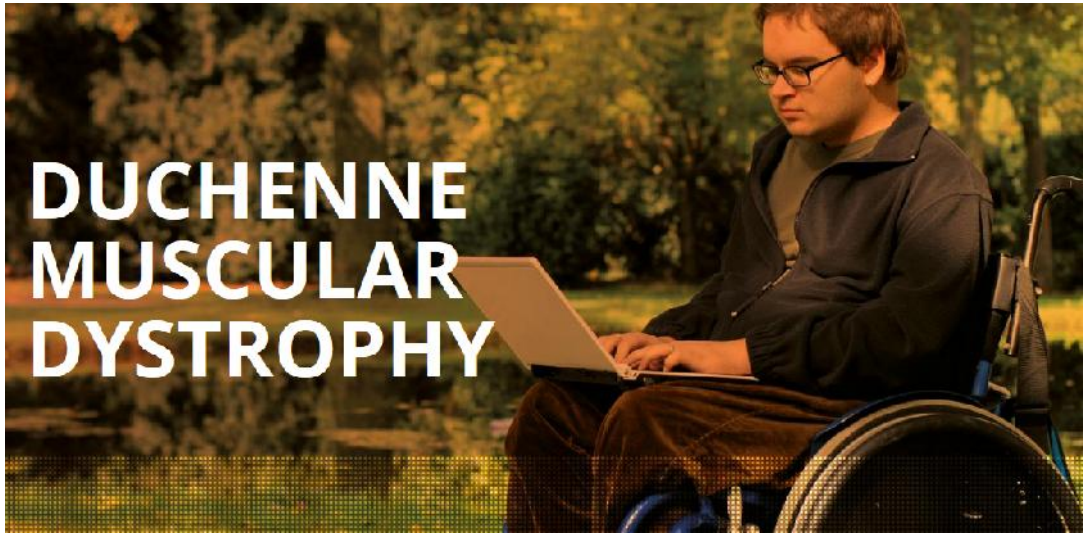
- Age: 24 years
- Diagnosed with LHON at age 17
- Differential diagnosis took over 5 months (misdiagnosed as MS and brain tumor)
- Treated with idebenone
- Has now stable preserved vision (45% left eye and 10-15% right eye)
- Medal winner in swimming championships
- Member of Italian Paralympic team

Clinical efficacy of Raxone® in LHON



Progress with Raxone® in DMD

- **Filing of Marketing Authorization Application for Raxone® for the treatment of Duchenne Muscular Dystrophy (DMD) in EU and Switzerland**
- **Start of new Phase 3 trial *SIDEROS* in DMD patients on concomitant glucocorticoid treatment**
- **Orphan drug designation granted for Australia**

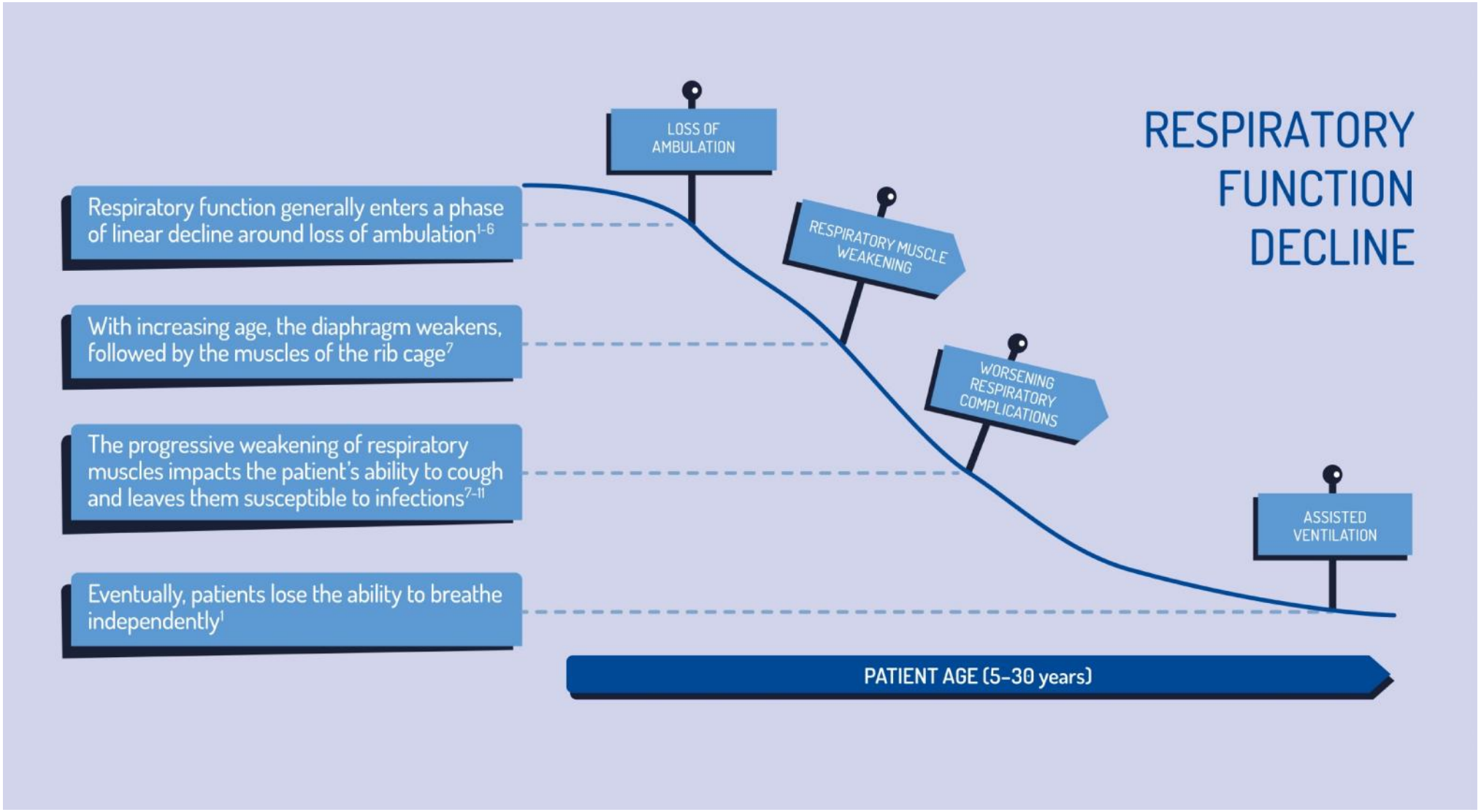


Positioning of Raxone® as treatment of DMD

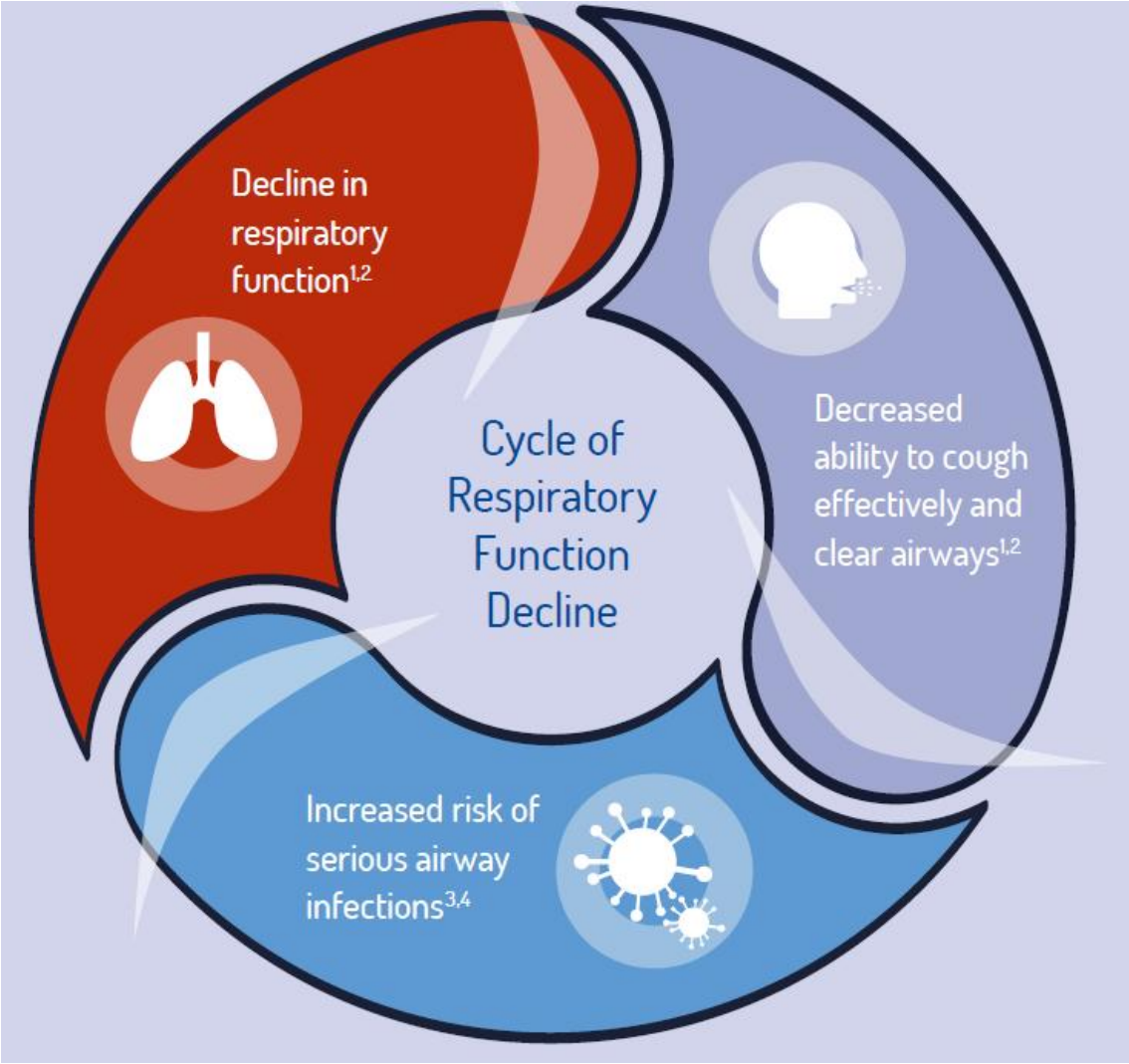
Santhera Files Marketing Authorization Application in the European Union for Raxone® for the Treatment of Duchenne Muscular Dystrophy

Liestal, Switzerland, May 31, 2016 – Santhera Pharmaceuticals (SIX: SANN) announces that it has submitted a Marketing Authorization Application (MAA) to the European Medicines Agency (EMA) for Raxone® (idebenone) for the treatment of Duchenne muscular dystrophy (DMD) in patients with respiratory function decline and not taking concomitant glucocorticoids. The new indication was submitted as Type II variation of the company's existing marketing authorization for Raxone granted last year. Raxone has Orphan Drug Designation for DMD in the EU.

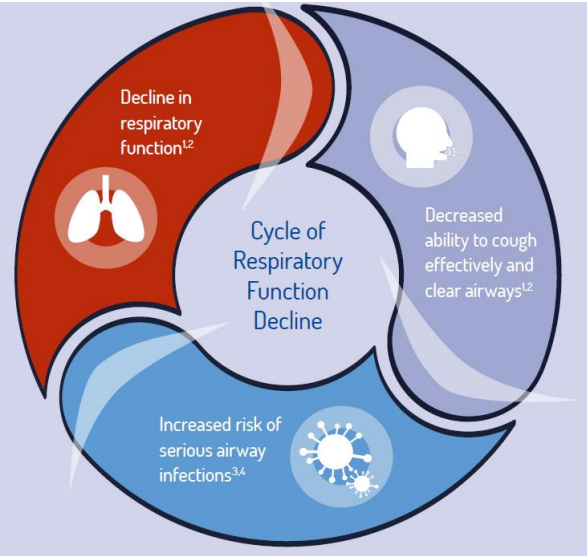
Respiratory complications in patients with DMD

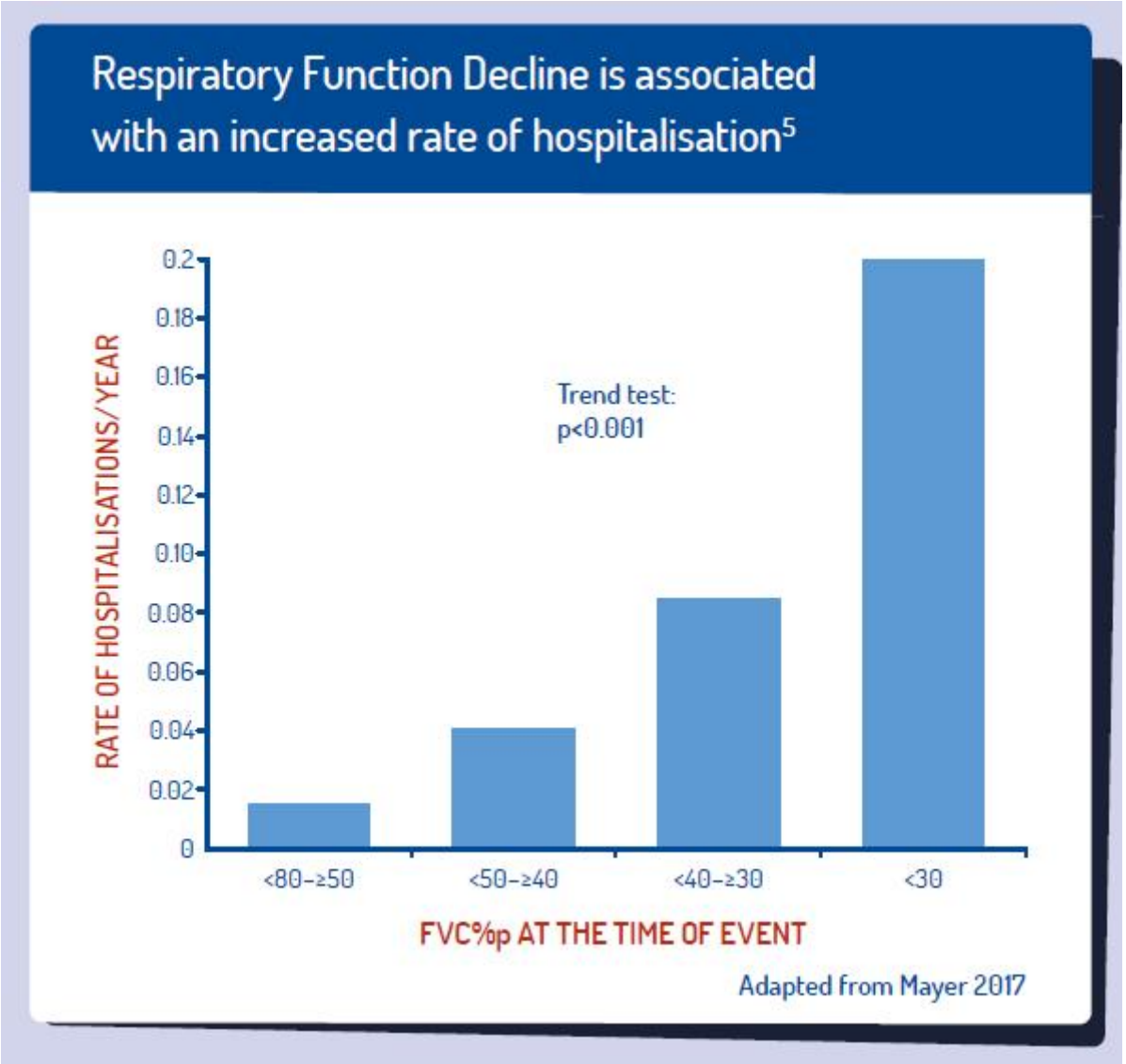


Respiratory complications in patients with DMD

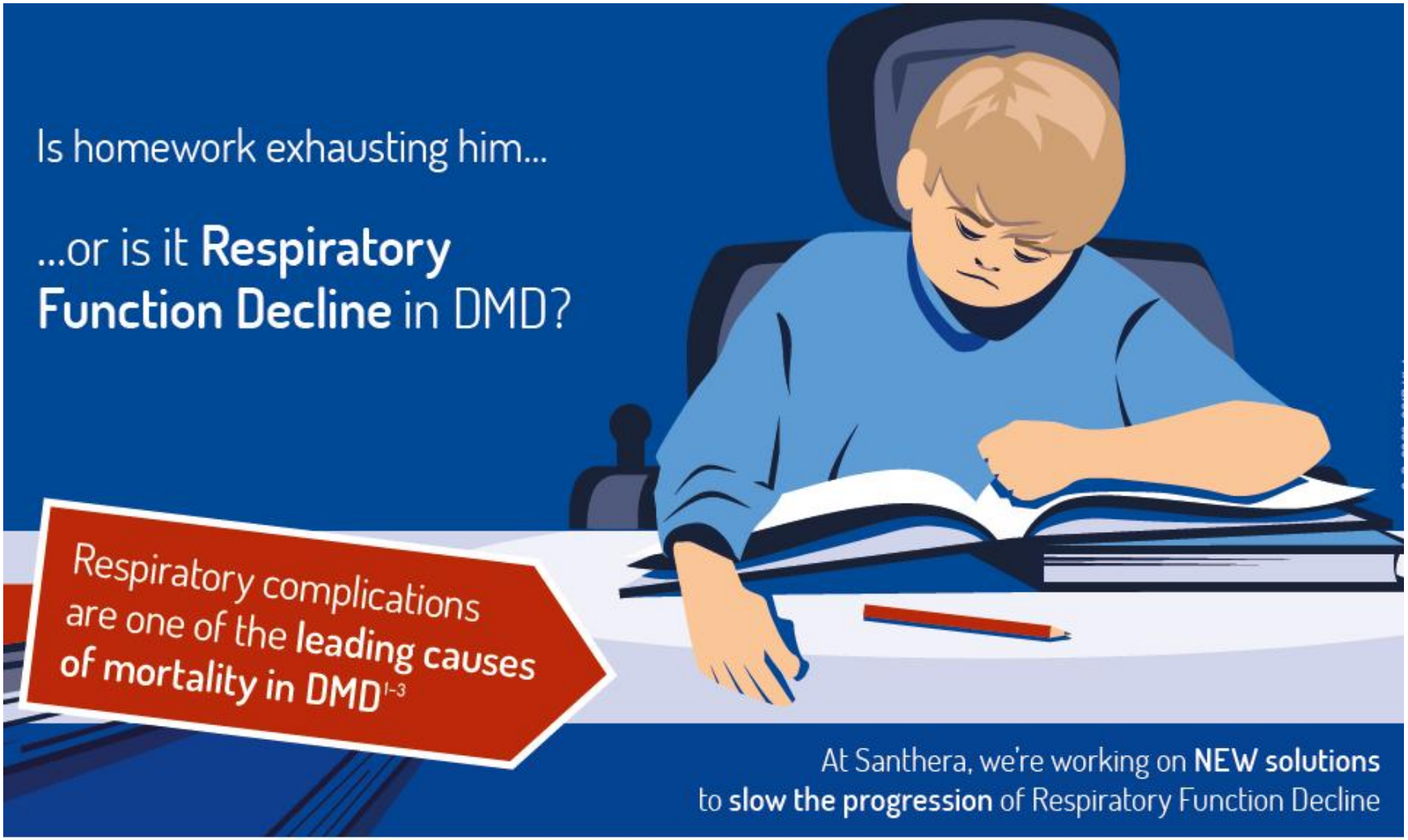


Respiratory complications and early morbidity

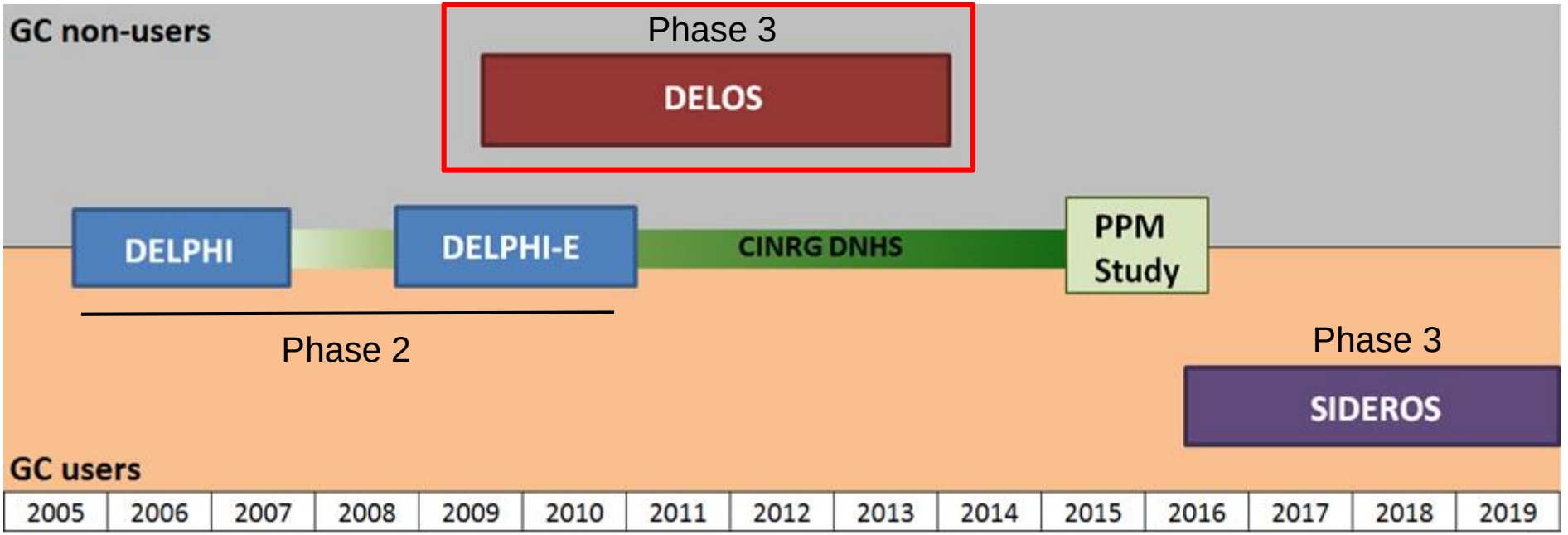




The medical need …. raising awareness



Development program with Raxone® in DMD



GC: glucocorticoid steroids; PPM study: prospectively planned matching study

Understanding the clinical value of Raxone® in the treatment of DMD

Santhera Co-Sponsors and Presents at the First "Duchenne Pulmonary Outcomes Workshop" Organized by Parent Project Muscular Dystrophy (PPMD)

Treatment Effect of Idebenone on Inspiratory Function in Patients With Duchenne Muscular Dystrophy

Gunnar M. Buyse, MD, PhD,[1*] Thomas Voit, MD,[2] Ulrike Schara, MD,[3] Chiara S.M. Straathof, MD,[4] Maria Grazia D'Angelo, MD,[5] Günther Bernert, MD,[6] Jean-Marie Cuisset, MD,[7] Richard S. Finkel, MD,[8] Nathalie Goemans, MD,[1] Christian Rummey, PhD,[9] Mika Leinonen, MS,[9] Oscar H. Mayer, MD,[10] Paolo Spagnolo, MD,[11] Thomas Meier, PhD,[11] and Craig M. McDonald, MD,[12]

[1–9,11–20]

Idebenone reduces respiratory complications in patients with Duchenne muscular dystrophy

Craig M. McDonald [a], Thomas Meier [b], Thomas Voit [c,1], Ulrike Schara [d], Chiara S.M. Straathof [e], M. Grazia D'Angelo [f], Günther Bernert [g], Jean-Marie Cuisset [h], Richard S. Finkel [i], Nathalie Goemans [j], Christian Rummey [k], Mika Leinonen [k], Paolo Spagnolo [b], Gun

Characterization of pulmonary function in 10–18 year old patients with Duchenne muscular dystrophy

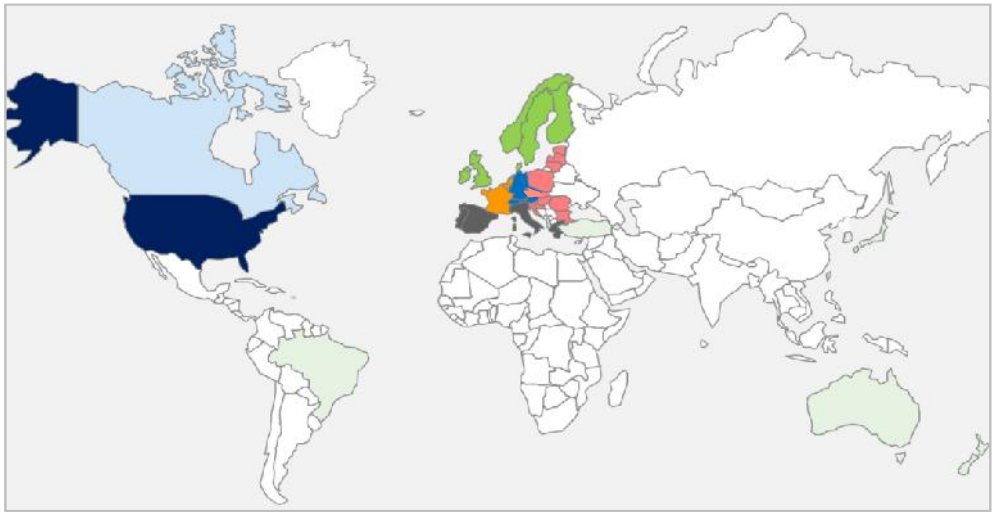
Thomas Meier [a], Christian Rummey [b], Mika Leinonen [a,b], Paolo Spagnolo [a,c], Oscar H. Mayer [d], Gunnar M. Buyse [e,*] for the DELOS Study Group

Initial target population for Raxone® in DMD

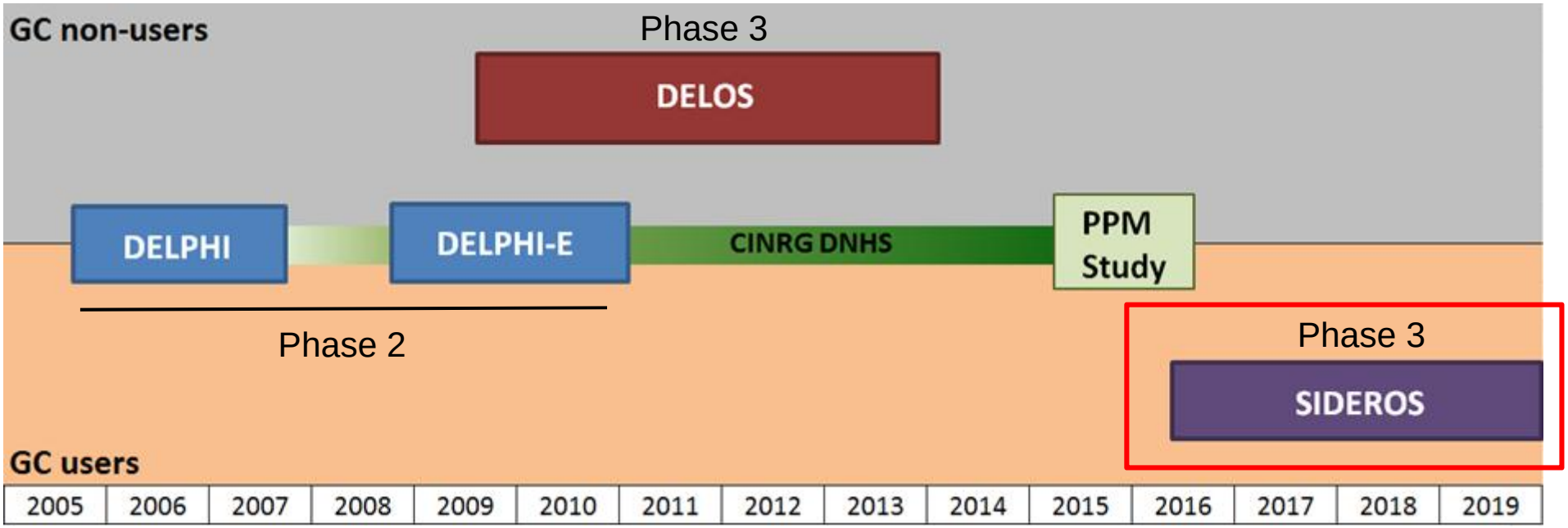
Patients with respiratory function decline currently not using glucocorticoids

- patients 8 years and older not using glucocorticoids represent 40% of total DMD population

	Population [m]	DMD Patients	Raxone Target Pop.
US	320	12,800	5,120
CA	35	1,400	560
	355	14,200	5,680
D-A-CH	100	4,000	1,600
F-BeNeLx	95	3,800	1,520
UK-Nordics	95	3,800	1,520
Southern	125	5,000	2,000
Eastern	105	4,200	1,680
	520	20,800	8,320



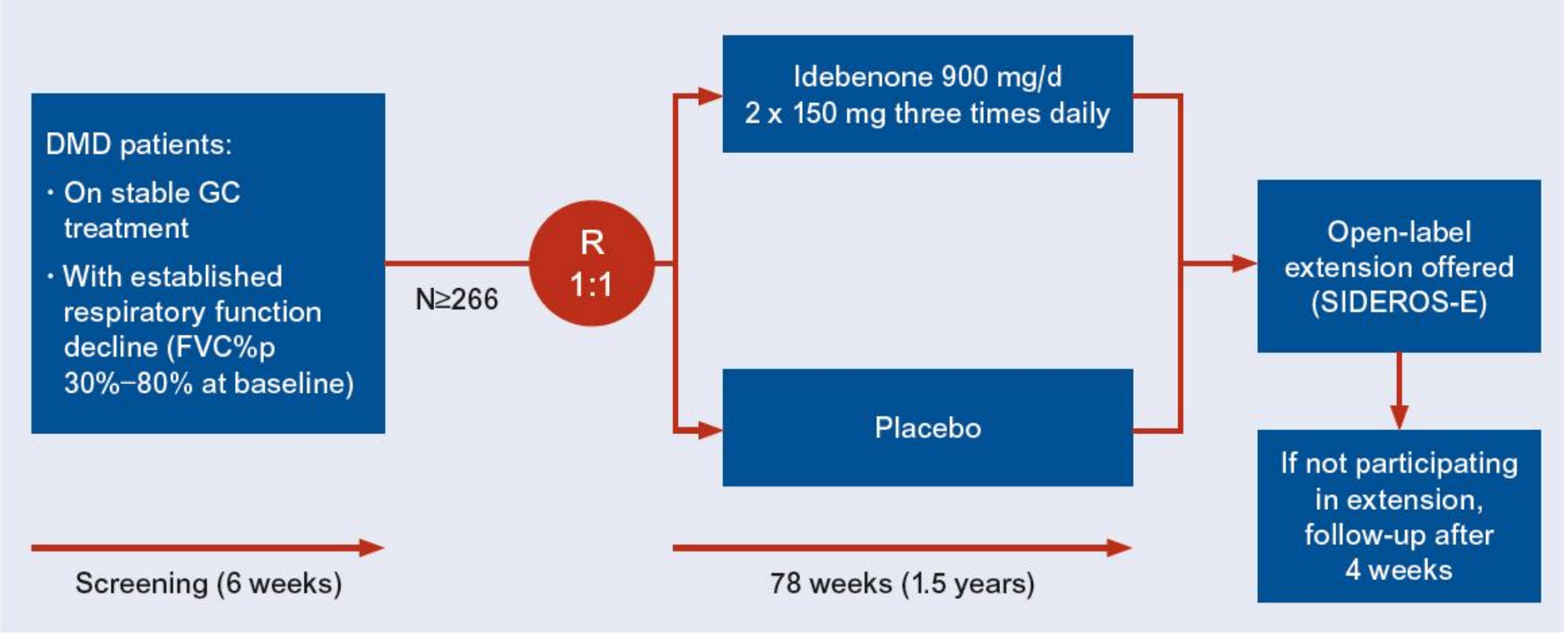
SIDEROS – a new trial with Raxone® in patients with DMD using concomitant glucocorticoids (GCs)



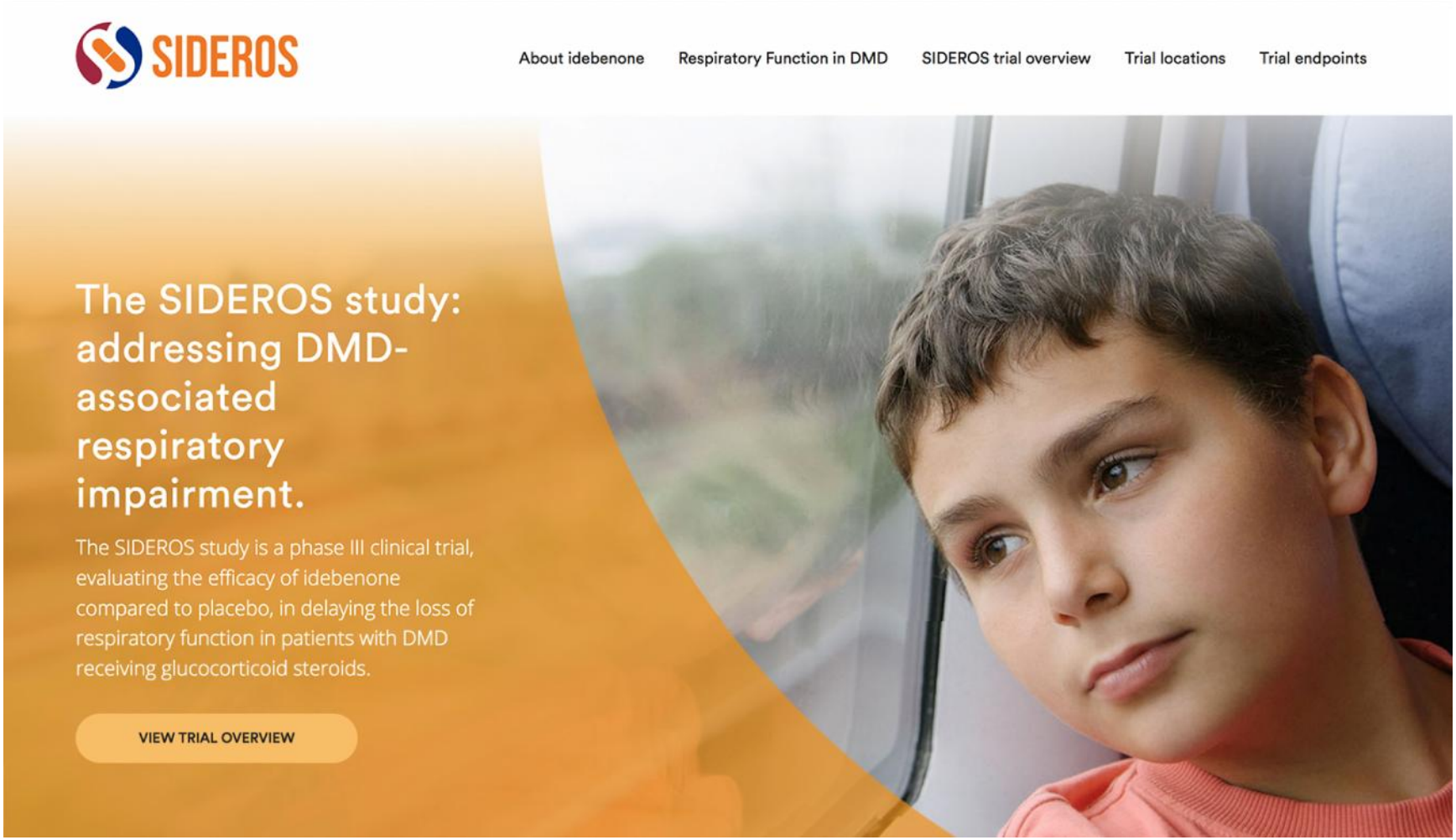
GC: glucocorticoid steroids; PPM study: prospectively planned matching study

The *SIDEROS* trial

To assess the efficacy of idebenone (Raxone®) compared to placebo, in slowing the loss of respiratory function in patients with DMD **receiving glucocorticoids** (GCs)



Finding patients for *SIDEROS*



Near-term regulatory objective

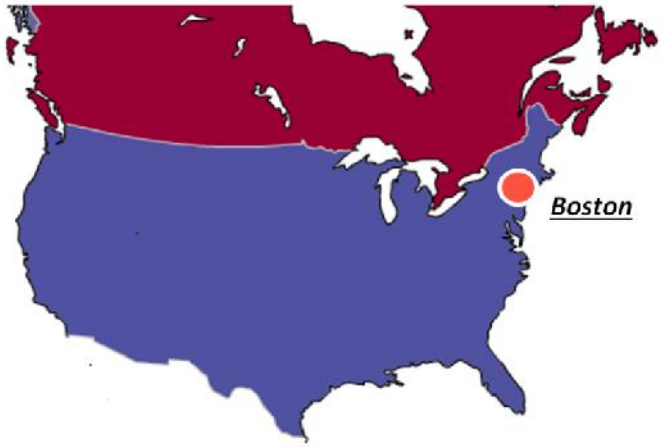
- Based on DELOS data obtain early approval for DMD patients not using steroids

The intended indication is for patients in whom respiratory function has started to decline and who are currently not taking glucocorticoids.

The indication would include patients who previously were treated with glucocorticoids or in whom glucocorticoid treatment is not desired, not tolerated or is contraindicated.

- In EU: Marketing Authorization Application (MAA) under review by CHMP
- In Switzerland: Marketing Authorization Application (MAA) under review by Swissmedic
- In US: Possibility for Accelerated Approval to be further evaluated with FDA

Management targets US opportunity



Todd Bazemore
Chief Operating Officer of Santhera Pharmaceuticals (USA), Inc.

Objectives for U.S. team for 2017:

- Intensify interactions with clinical experts, patients advocacy groups and FDA
- Develop regulatory strategy for early approval of Raxone® in DMD
- Support enrolment of *SIDEROS* trial
- Prepare commercial opportunity

Kristina Sjöblom Nygren
Chief Medical Officer and Head of Development

Progress with omigapil in congenital muscular dystrophy (CMD)

- **FDA granted Fast Track Designation for omigapil for the treatment of CMD**
- **Received FDA Grant in support of the ongoing *CALLISTO* trial with omigapil**

The *CALLISTO* trial with omigapil in patients with CMD

- Conducted at the US National Institutes of Health
- Dose escalation design to establish pharmacokinetics; safety & tolerability
- Total study cohort of 20 patients
- Will be completed in 2017

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Santhera Pipeline

Santhera Pipeline	Preclin.	Phase 1	Phase 2	Phase 3	Filing	Market	
Raxone® (idebenone 150mg)							
Leber`s Hereditary Optic Neuropathy				LHON			*EU approval*
Duchenne Muscular Dystrophy				DMD			*Filed in EU*
Primary Progressive Multiple Sclerosis			PPMS				*Completion 2017 (at NIH)*
Omigapil							
Congenital Muscular Dystrophy		CMD					*Completion 2017 (at NIH)*

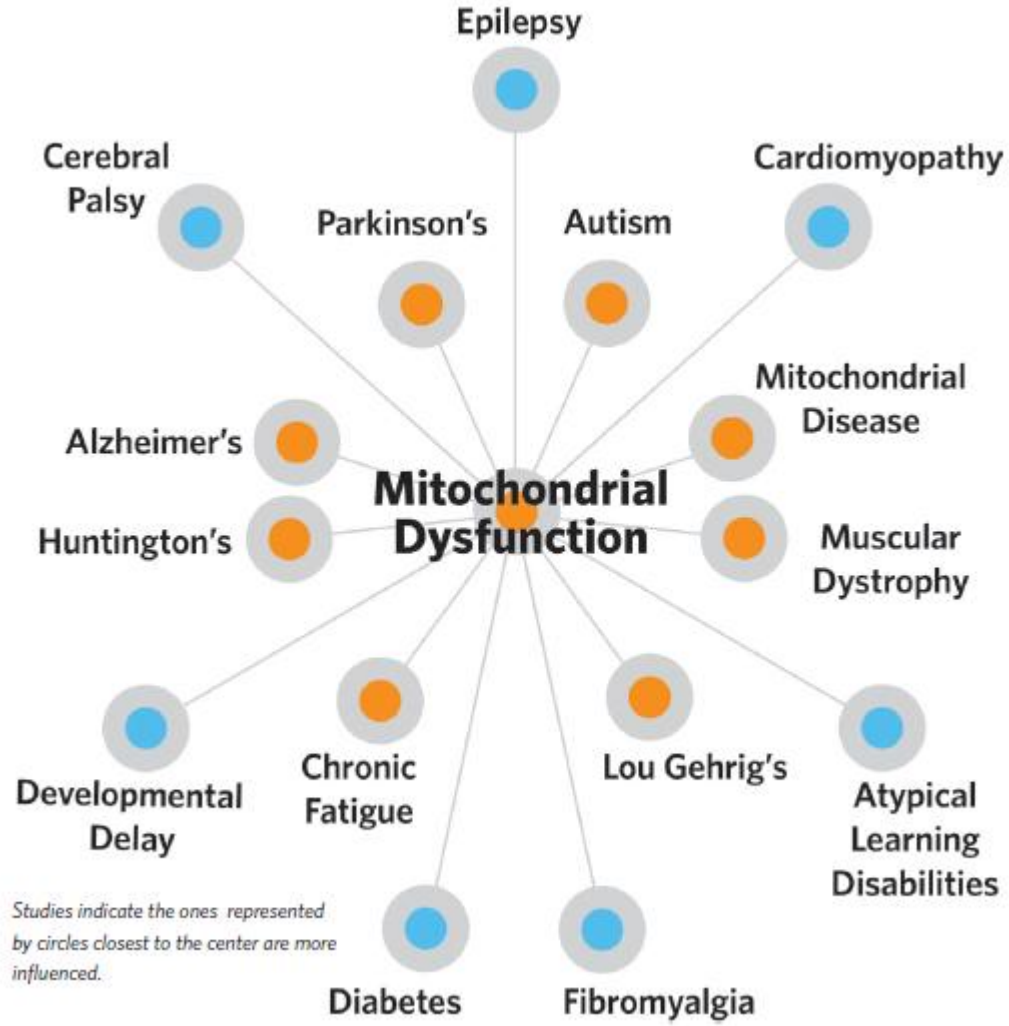
LHON

DMD

PPMS

CMD

Future opportunities for Santhera in advancing mitochondrial medicine



Source: Foundation for Mitochondrial Medicine

Outlook 2017

- Continue commercial roll-out in EU for Raxone® as treatment of LHON
- EU: Obtain Marketing Authorization for Raxone® as treatment of DMD
- US: Evaluate possibility for Accelerated Approval for Raxone® in DMD with FDA
- Complete enrolment of *SIDEROS* trial in DMD
- Complete *CALLISTO* trial in CMD
- Complete *IPPoMS* trial in primary progressive MS
- Explore business development opportunities in mitochondrial diseases

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