LYRA THERAPEUTICS

CHRONIC RHINOSINUSITIS

KEY OPINION LEADER EVENT

AUGUST 31, 2021

DISCLAIMER

This presentation contains forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. All statements contained in this presentation that do not relate to matters of historical fact should be considered forward-looking statements, including statements regarding the company's lead product candidate LYR-210, the presentation of results relating to the Company's Phase 2 LANTERN clinical trial for LYR-210 and the Company's plans to initiate a pivotal Phase 3 study for LYR-210 in CRS for both non-polyp and polyp patients. These statements are neither promises nor guarantees, but involve known and unknown risks, uncertainties and other important factors that may cause the company's actual results, performance or achievements to be materially different from any future results, performance or achievements expressed or implied by the forward-looking statements, including, but not limited to, the following: the fact that the company has incurred significant losses since inception and expects to incur losses for the foreseeable future; the company's need for additional funding, which may not be available; the company's limited operating history; the fact that the company has no approved products; the fact that the company's product candidates are in various stages of development; the fact that the company may not be successful in its efforts to identify and successfully commercialize its product candidates; the fact that clinical trials required for the company's product candidates are expensive and time-consuming, and their outcome is uncertain; the fact that the FDA may not conclude that certain of the company's product candidates satisfy the requirements for the Section 505(b)(2) regulatory approval pathway; the company's inability to obtain required regulatory approvals; effects of recently enacted and future legislation; the possibility of system failures or security breaches; effects of significant competition; the fact that the successful commercialization of the company's product candidates will depend in part on the extent to which governmental authorities and health insurers establish coverage, adequate reimbursement levels and pricing policies; failure to achieve market acceptance; product liability lawsuits; the fact that the company relies on third parties for the manufacture of materials for its research programs, pre-clinical studies and clinical trials; the company's reliance on third parties to conduct its preclinical studies and clinical trials; the company's inability to succeed in establishing and maintaining collaborative relationships; the company's reliance on certain suppliers critical to its production; failure to obtain and maintain or adequately protect the company's intellectual property rights; failure to retain key personnel or to recruit qualified personnel; difficulties in managing the company's growth; effects of natural disasters; the fact that the global pandemic caused by COVID-19 could adversely impact the company's business and operations, including the company's clinical trials; the fact that the price of the company's common stock may be volatile and fluctuate substantially; significant costs and required management time as a result of operating as a public company and any securities class action litigation. These and other important factors discussed under the caption "Risk Factors" in the company's Quarterly Report on Form 10-Q filed with the SEC on August 9, 2021 and its other filings with the SEC could cause actual results to differ materially from those indicated by the forward-looking statements made in this presentation. Any such forward-looking statements represent management's estimates as of the date of this presentation. While the company may elect to update such forward-looking statements at some point in the future, it disclaims any obligation to do so, even if subsequent events cause its views to change.

This presentation also includes statistical and market data that we obtained from industry [publications and research, surveys and studies conducted by third parties or us. Industry publications and third-party research, surveys and studies generally indicate that their information has been obtained from sources believed to be reliable, although they do not guarantee the accuracy or completeness of such information. All of the market data used in this presentation involves a number of assumptions and limitations, and you are cautioned not to give undue weight to such estimates. While we believe these industry publications and third-party research, surveys and studies are reliable, we have not independently verified such data. The industry in which we operate is subject to a high degree of uncertainty, change and risk due to a variety of factors, which could cause results to differ materially from those expressed in the estimates made by the independent partners and by us.

WELCOME & AGENDA

Amber U. Luong, MD, PhD, FACS

Professor and Vice Chair for Research in Otorhinolaryngology, Head & Neck Surgery at University of Texas' McGovern Medical School

Brent Senior, MD, FACS, FARS

Professor and Vice Chair of Otolaryngology at University of North Carolina's School of Medicine

Overview of Lyra's Proprietary Platform: XTreo™	**Maria Palasis, PhD, President & CEO**
Overview of LYR-210 & LYR-220	**Robert Kern, MD, Chief Medical Officer**
KOL Perspectives	**Amber U. Luong, MD, PhD** **Brent Senior, MD** **Robert Kern, MD**
Q&A	

COMPANY OVERVIEW

Working to disrupt the treatment paradigm for intranasal drug delivery, starting with CRS

Proprietary Xtreo™ platform delivers the RIGHT DRUG to the RIGHT PLACE for the RIGHT AMOUNT OF TIME to treat chronic diseases

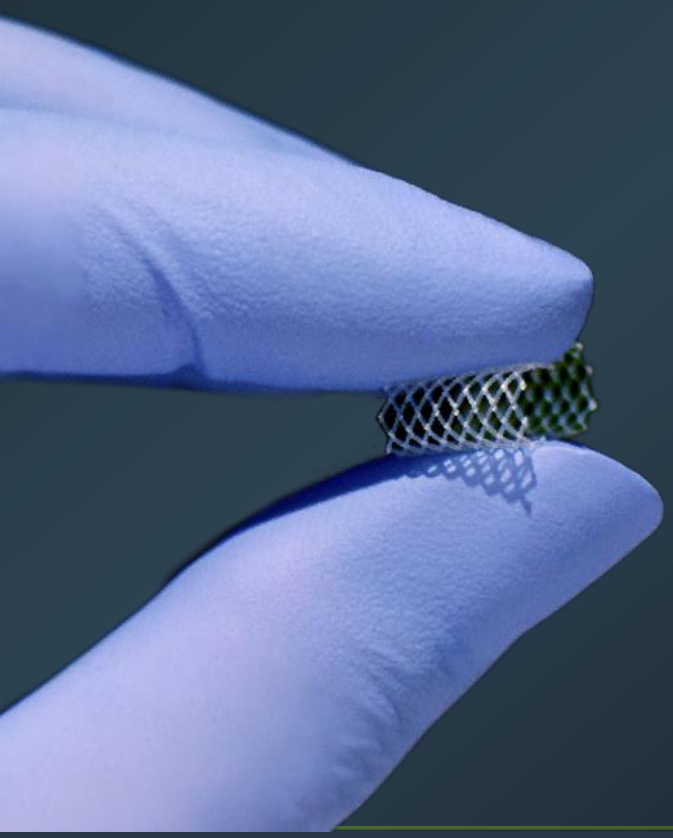
Creating the standard of care for the millions of patients suffering from CRS and for which there is no approved therapeutic treatment

Achieved consistent, dramatic improvement in 3 clinical studies to date

Poised to be the dominate player in this $6B opportunity

XTREO™ PLATFORM

SUSTAINED TARGETED DRUG DELIVERY



- Months of local drug therapy
- Consistent daily dosing
- Shape memory keeps matrix in place
- Single non-invasive administration

WHAT IS CHRONIC RHINOSINUSITIS (CRS)?

Chronic Rhinosinusitis: The “Unrecognized Epidemic”[1]

CRS Cardinal Symptoms[1]

- **Nasal obstruction and congestion**
- **Facial pain and pressure**
- **Nasal discharge**
- **Olfactory loss**

United States

~14M	CRS Prevalent Patients[2]
~8M	CRS Patients Treated by Physicians Annually[3]
~4M	CRS Patients Failing Medical Management Annually[4]
400K	Surgeries annually

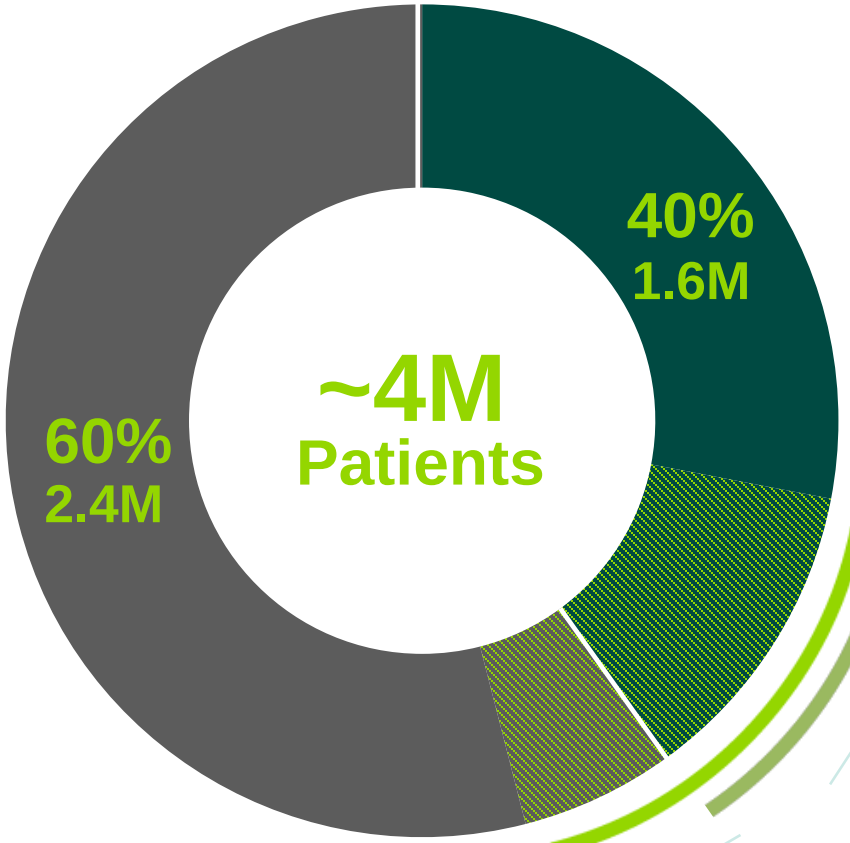
1) Tan BK et al. Am J Respir Crit Care Med, 2013;188(11):1275–7; 2) Battacharrya. Ann Otol Rhinol Laryngol, 2011; Jul;120(7):423-7; 3) Jang et al. Otolaryngol Head Neck Surg, 2018; 4) Baguley et al. Int Forum Allergy Rhinol, 2014;4(7):525-32

DEVELOPING SOLUTIONS FOR ALL CRS PATIENTS

LYR-210 and LYR-220 are designed for the full range of CRS patients treated by ENTs

LYR-210

CRS Patients with Surgically Naïve Anatomy



LYR-220

CRS Patients with Post-Surgical Anatomy

Antibodies & Steroid Implants

Patients with polyps

LYR-210 OFFERS MEANINGFUL IMPROVEMENT IN CARE

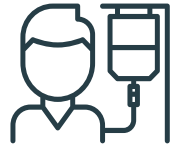
NON-SYSTEMIC DELIVERY FOR MONTHS TO A BROAD PATIENT POPULATION

Local effect

6-month continuous treatment with one application

For non-polyp & polyp CRS

Surgically naïve anatomy

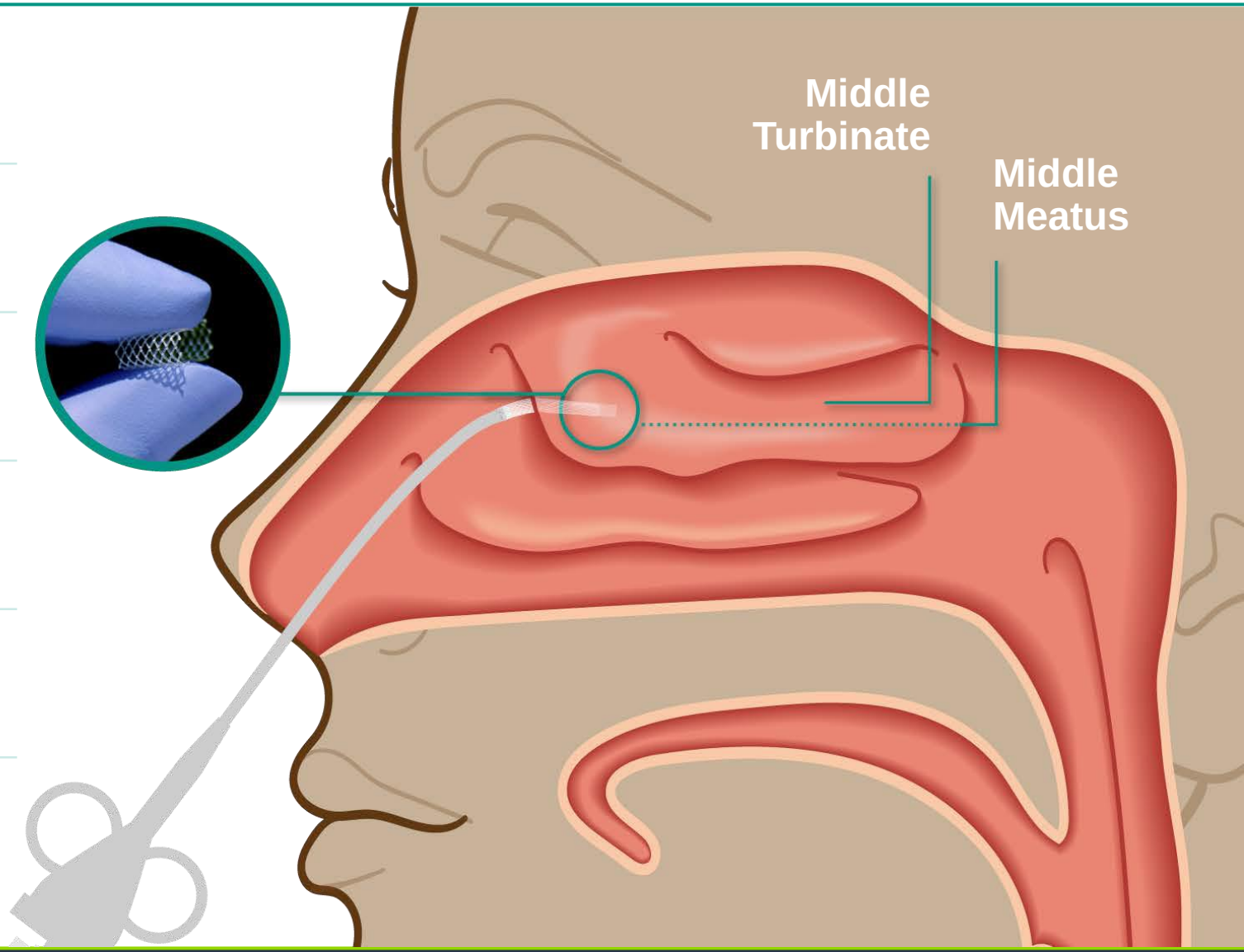


Requires no patient compliance

LYR-210: DESIGNED TO BE THE GOLD STANDARD

Only product candidate designed to provide 6 months of CRS therapy with a single treatment

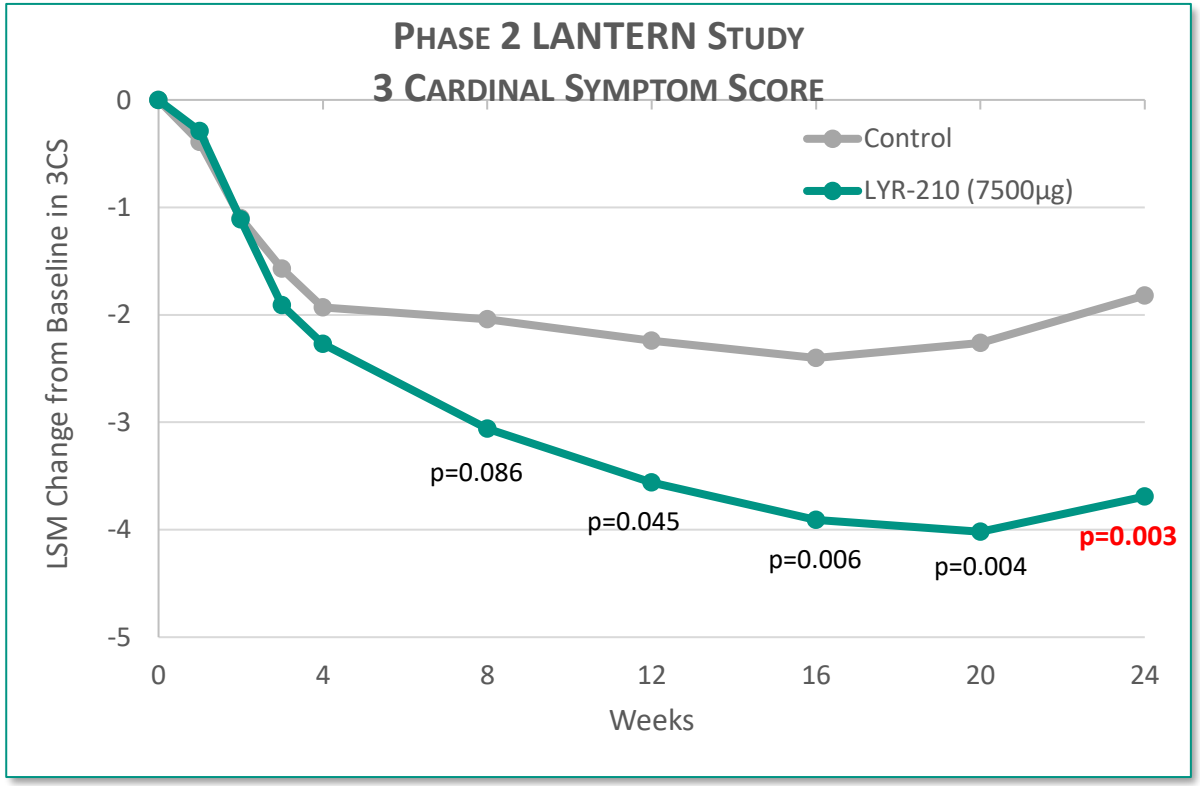
- FDA-approved API/steroid: Mometasone furoate
- Provides continuous treatment as an alternative to surgery
- Administered nasally via a single-use applicator
- Office-based procedure with topical anesthesia
- Not detectable by patients
- Designed to be replaced every 6 months



LYR-210: SUMMARY RESULTS FROM PHASE 2 LANTERN STUDY

- **Robust effect on 3 cardinal symptoms: highly statistically significant at week 24**
- **6-month benefit from a single administration**
- **Showed benefit in both polyp and non-polyp patients**

CHANGE FROM BASELINE IN 3CS AT WEEK 24[1,2]



Statistically Significant Improvement vs Control at Weeks 12 - 24

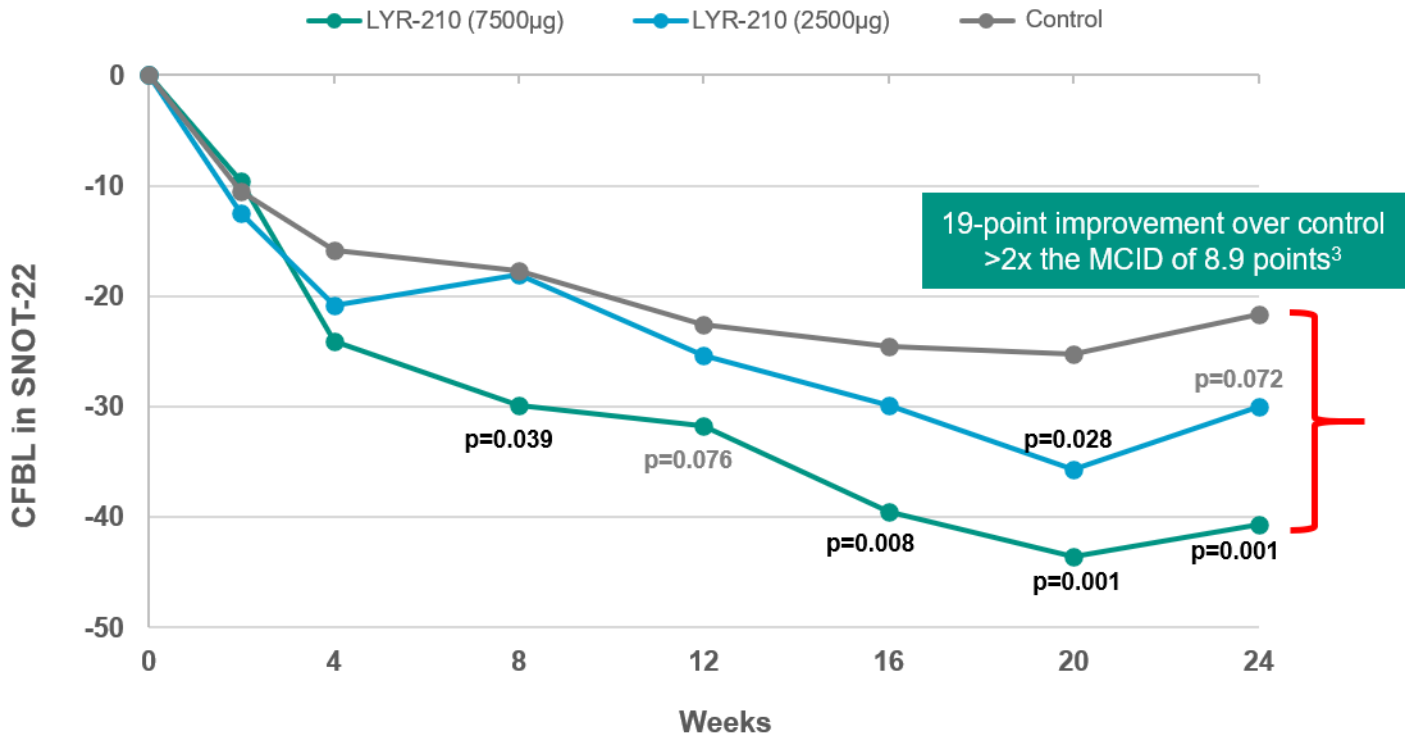
1) Mean change from baseline (CFBL) in the 7-day average score in the 3CS composite score (nasal blockage, facial pain/pressure, and nasal discharge (anterior/posterior); 2) Data represents LSM. P<0.05 is considered statistically significant to control

LYR-210

POSITIVE LANTERN PHASE 2 STUDY

- Rapid, durable and clinically meaningful results based on gold standard measurement
- >2X the MCID of 8.9 points relative to control
- 70% of patients in the 7500 mcg group improved ≥ MCID at week 4; 100% by week 24

SYMPTOM IMPROVEMENT BY SNOT-22[1,2] THE CLINICAL GOLD STANDARD

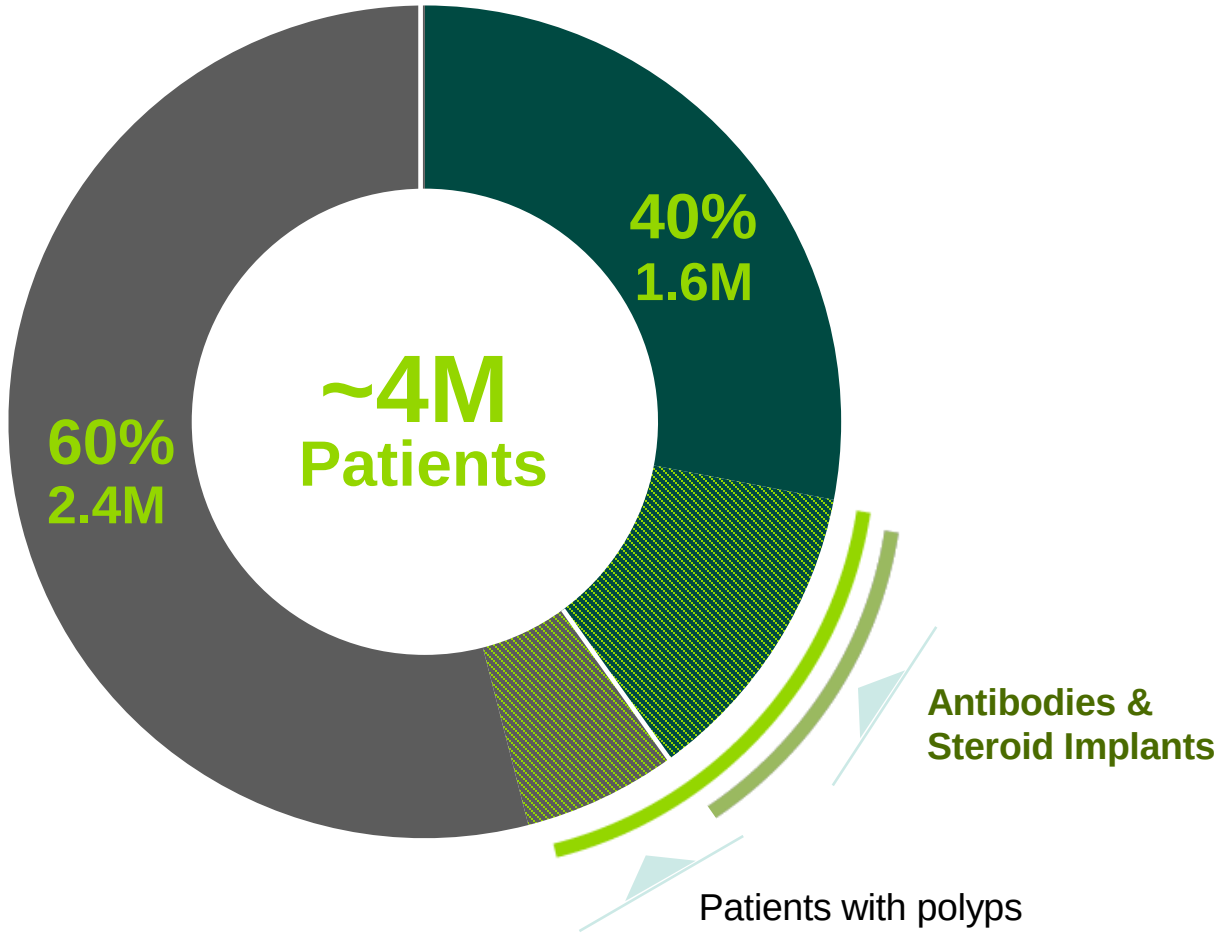


Statistically Significant Improvement vs Control at 8, 16, 20 and 24 wks

1) SinoNasal Outcome Test is a patient reported score from 0 – 110 based on symptoms; 2) Data represents the least square mean. Missing data and data post use of rescue medication was imputed by LOCF method; 3) Minimal clinically important difference

LYR-220 TARGETS CRS PATIENTS WITH POST-SURGICAL ANATOMY

- Scaled—up matrix for larger post-surgical anatomy
- Same drug dosing profile, kinetics and materials
- Enter the clinic around YE'21
- Regulatory path will leverage LYR-210



LYR-210 & LYR-220 UPCOMING TRIALS

LYR-210 ENLIGHTEN
Phase 3 Program

Adult patients with CRS that have failed medical management and not had ESS

Primary Endpoint: 3 Cardinal Symptoms at 24 weeks

2:1 randomization:
7500µg,
Control

~350 subjects split between two staggered studies; >95% power per study

Other Endpoints: SNOT-22, rescue treatments, sinus CT, QoL, PE

First Phase 3 trial to begin around YE'21

LYR-220 BEACON
Phase 2 Study

Adult patients with CRS that have failed medical management and had a total ESS

Primary Endpoint: safety & feasibility over 24 weeks

1:1:1 randomization: Design 1 7500µg, Design 2 7500µg, Control

~ 65 subjects in US & Australia

Other Endpoints: PK, SNOT-22, 3CS, rescue treatments, sinus CT, nasal biomarkers, QoL

Trial to begin around YE'21

KOL PERSPECTIVES

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