Strongbridge Biopharma plc

December 2019

STRONGBRIDGE BIOPHARMA

Forward-looking statements

This document contains forward-looking statements relating to the Company's strategy, objectives, business development plans and financial position. All statements other than statements of historical facts included in this document, including, without limitation, statements regarding the Company's future financial position, strategy, anticipated investments, costs and results, status and results of clinical trials, anticipated timing of release of results from clinical trials, size of patient population potential advantages of a product or product candidate, anticipated timing of activities related to the regulatory approval process for a product candidate, the release of additional planned analyses of clinical trials, plans, outcomes of product development efforts, intellectual property portfolio and objectives of management for future operations, may be deemed to be forward-looking statements. You can identify forward-looking statements by words such as "anticipate," "believe," "could," "estimate," "expect," "intend," "may," "plan," "potential," "predict," "project," "should," "will," "would" or the negative of those terms, and similar expressions that convey uncertainty or future events or outcomes.

These forward-looking statements involve known and unknown risks, uncertainties, and other factors that may cause the Company's actual results, performance, or achievements or industry results to be materially different from those contemplated, projected, forecasted, estimated or budgeted, whether expressed or implied, by these forward-looking statements. Given these risks and uncertainties, investors should not place undue reliance on forward-looking statements as a prediction of actual results. A discussion of certain of these risks may be found in the filings the Company makes with the U.S. Securities and Exchange Commission. None of these forward-looking statements constitutes a guarantee of the future occurrence of such events or of actual results. These statements are based on data, assumptions, and estimates that the Company believes are reasonable.

The forward-looking statements contained in this document are made only as of the date hereof. Except as otherwise required by law, the Company expressly disclaims any obligation or undertaking to release publicly any updates of any forward-looking statements contained in this document to reflect any change in its actual results, assumptions, expectations or any change in events, factors, conditions, or circumstances on which any forward-looking statement contained in this document is based.

Strongbridge portfolio

Focused on building a portfolio of rare disease, therapeutically-aligned franchises

		Indication/ Target Disease	Pre-clinical	Phase 1	Phase 2	Phase 3	Marketed	Commercial Rights
Rare Endocrinology	RECORLEV™ (levoketoconazole)	Endogenous Cushing's syndrome (CS)	Phase 3					STRONGBRIDGE BIOPHARMA Global
Rare Endocrinology	veldoreotide modified-release	Conditions modifiable through activation of somatostatin receptors, such as Cushing's disease and neuroendocrine tumors	Pre-clinical	Immediate Release Formulation Completed Phase 2				STRONGBRIDGE BIOPHARMA Global
Rare Neuro-muscular	KEVEYIS® (dichlorphenamide)	Primary Periodic Paralysis (PPP)	Marketed					STRONGBRIDGE BIOPHARMA US

Recorlev

(levoketoconazole)

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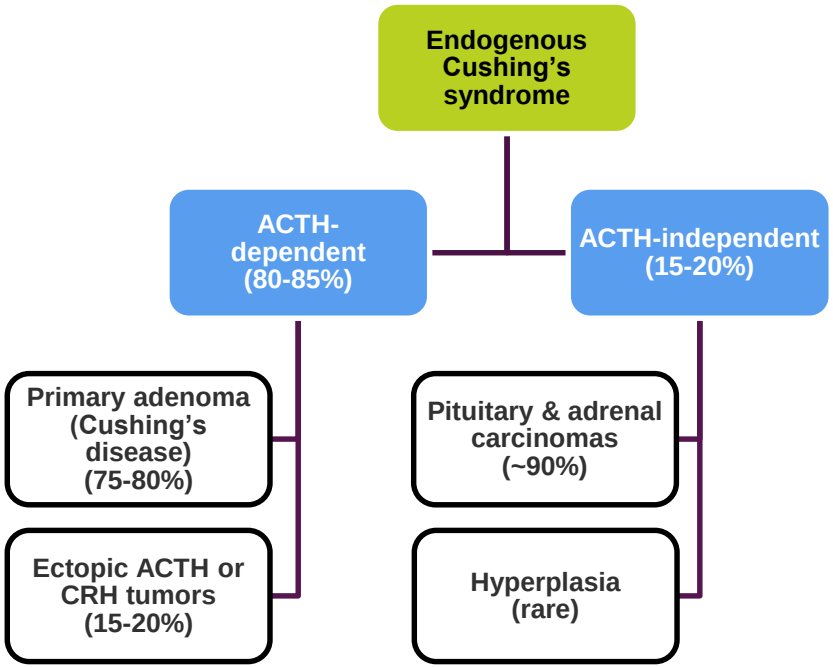
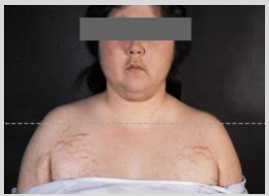
Endogenous Cushing's syndrome overview

Underlying cause is chronic exposure to excess serum cortisol due to any of several etiologies



Cushing's syndrome affects the whole body

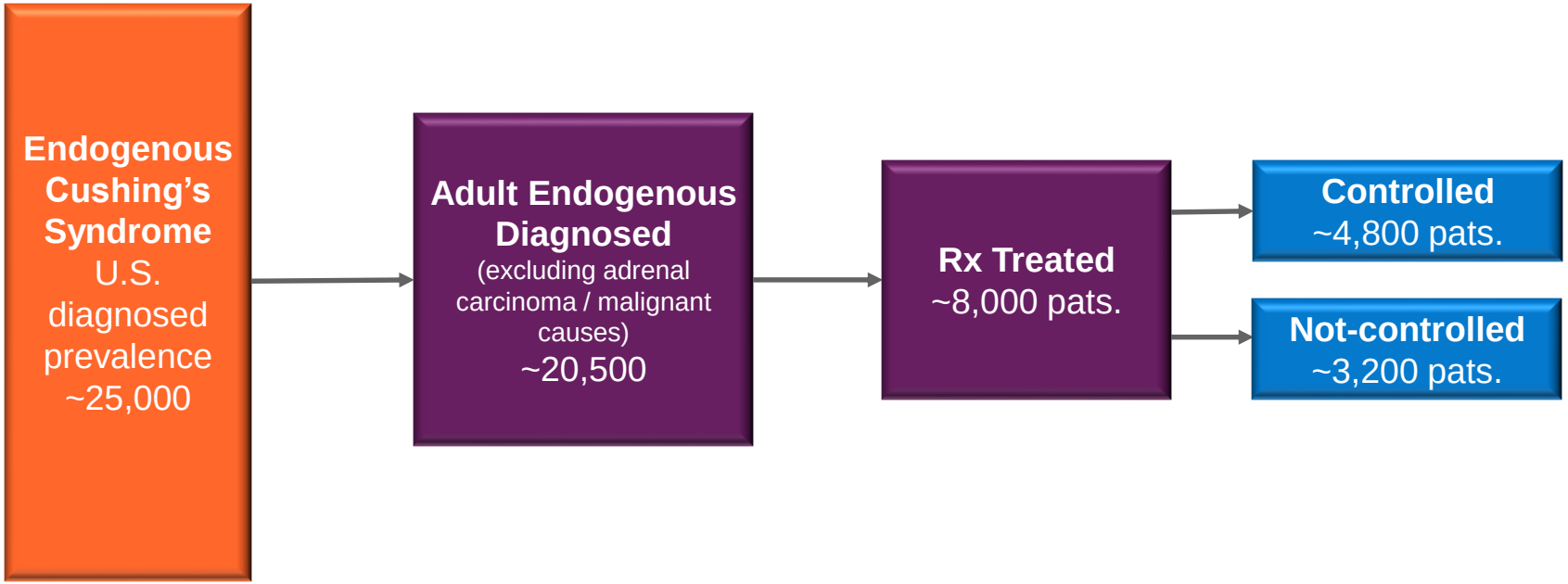
- Psychosis, impaired memory, sleep disturbance, depression, anxiety
- Heart attacks, stroke, high blood pressure, high cholesterol, vein clots
- Overweight/obesity, facial, neck and abdominal fat accumulation, diabetes
- Muscle and skin atrophy
- Osteoporosis



Cushing's disease patients have 2-5x higher incidence rates of comorbidities, 7x higher medical costs, 4x higher pharmacy costs*

Abbreviation: ACTH, adrenocorticotropic hormone. Source: Sharma TS, et al. *Clin Epidemiol*. 2015;7:281–293. *According to a retrospective analysis of claims from a large US commercial health plan (885 selected Cushing's disease cases and 2,655 matched controls without Cushing's disease) from 2007 to 2011.

Treatment paradigm & prevalence



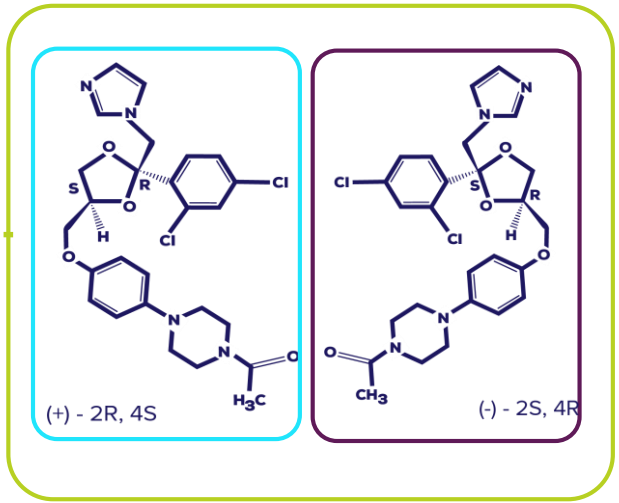
Source: Company-sponsored research

Levoketoconazole is the sole active enantiomer of ketoconazole in Cushing's syndrome

DEXTROKETOCONAZOLE

- Right-handed enantiomer
- Estimated to contribute essentially no activity towards the inhibition of adrenal cortisol synthesis by ketoconazole

KETOCONAZOLE
Racemate with Two Enantiomers



LEVOKETOCONAZOLE

- Left-handed enantiomer
- Estimated to provide essentially all of the cortisol synthesis inhibition of ketoconazole in vivo

Auchus RJ, Wu JL, Peng HM "2S,4R-Ketoconazole is the Relevant Enantiomer of Ketoconazole for Cortisol Synthesis Inhibition: Steroidogenic P450s Inhibition Involves Multiple Mechanisms" Endocrine Society's Annual Meeting. University of Michigan, Chicago, IL. 18, March 2018. Poster presentation.

SONICS: A Phase 3, multi-center, open-label, non-randomized, single-arm study

Primary endpoint
Responder rate (normalized 24-hour mean urinary free cortisol at month 6 of maintenance without a dose increase during maintenance)

94 pats. enrolled in dose titration → 77 pats. entered maintenance → 61 pats. completed maintenance → 46 pats. completed extended evaluation

17 discontinued
6 adverse events
4 withdrew consent
3 insufficient efficacy
3 other reasons
1 physician decision

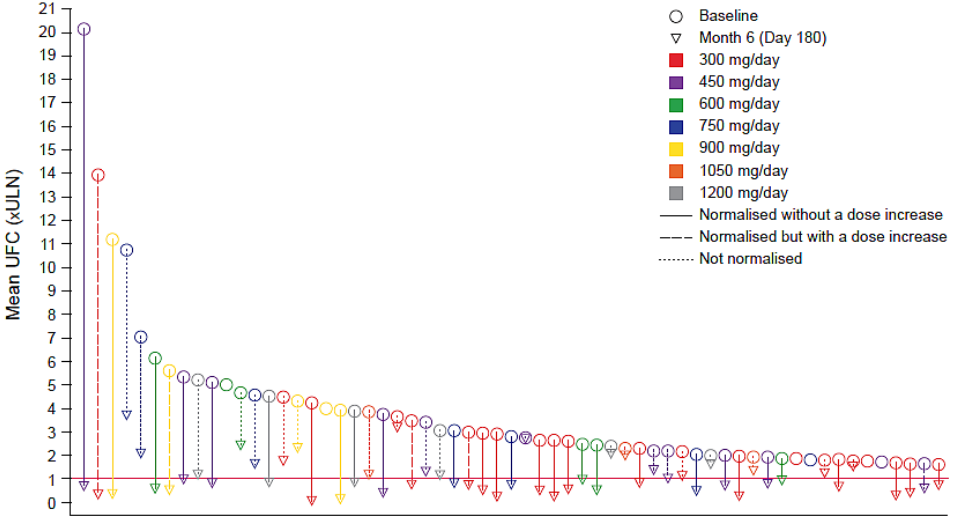
16 discontinued
6 adverse events
4 withdrew consent
4 insufficient efficacy
1 physician decision
1 other reasons

14 discontinued*
4 adverse events
3 insufficient efficacy
2 physician decision
2 withdrew consent
2 other reasons
1 death

*1 subject did not enter extended evaluation

SONICS achieved statistical significance for primary endpoint at end of maintenance

- Primary endpoint achieved statistical significance with 30% of patients (29/94) achieving mUFC normalization without dose increase (95% CI: 21%, 40%; p=.0154 vs null hypothesis), ITT analysis*



- Expanded mUFC "real world" analysis from SONICS further extends efficacy demonstration of RECORLEV

mUFC normalization at month 6 (irrespective of dose increase)	36% (34/94)
≥50% mUFC decrease or normalization at month 6 (irrespective of dose increase)	46% (43/94)
Maintenance phase completers with mUFC data and mUFC normalization at month 6 (irrespective of dose increase)‖	62% (34/55)
Maintenance phase completers with mUFC data and ≥50% mUFC decrease or normalization at month 6 (irrespective of dose increase)‖	78% (43/55)

*Based on mixed-effects, repeated-measures model with underlying binomial distribution and logit link function, adjusted for baseline covariates.
‖Data based on 55 maintenance phase completers with both baseline and month 6 mUFC data available.

SONICS achieved statistical significance in key secondary endpoints and QoL at end of maintenance phase

- Five key cardiovascular (CV) secondary endpoints with favorable changes from baseline
  - Improvements in HbA1c and fasting blood glucose were more pronounced among patients with diabetes mellitus

Outcome Measure at End of Maintenance Phase	Baseline Mean, (n)	Mean Change From Baseline†, (n)	Adjusted* p-value of reductions from Baseline
Fasting Blood Glucose	5.8 mmol/L, (76)	-0.7, (50)	<0.0001
Hemoglobin A1c	6.0%, (77)	-0.4, (55)	<0.0001
Total cholesterol	5.6 mmol/L, (75)	-1.1, (53)	<0.0001
LDL-cholesterol	3.3 mmol/L, (75)	-1.0, (53)	<0.0001
Body Weight	82.1 kg, (77)	-5.1, (54)	<0.0001

  - HDL-C decreased by 0.2 mmol/L, an unfavorable change from baseline outweighed by the LDL-C improvement
- Mean scores in patient reported outcomes of quality of life (QoL), hirsutism, acne, peripheral edema and depression all significantly improved at end of maintenance
- Significant improvements in above CV biomarkers (excluding glycemia) and most signs and symptoms of Cushing's persisted to Month 12 (end of the extended evaluation)

*Hochberg adjustment applied to p-values to control type 1 error
†Reductions from baseline based on least squares mean changes from repeated measures model

Adverse events in SONICS

Combined dose titration and maintenance phases, ITT

Most Common Adverse Events	N=94
Nausea	32%
Headache	28%
Peripheral edema	19%
Hypertension	17%
Fatigue	16%
ALT increased*	15%
Diarrhea	15%

- In general, there were no unforeseen or unexpected safety issues in the study

Adverse Events of Special Interest	N=94
Liver-related (7%)	7%
QTc prolongation (5%)	5%
Adrenal insufficiency (3%)	3%

- No late onset of adverse events of special interest; all occurred in the maintenance phase of the study

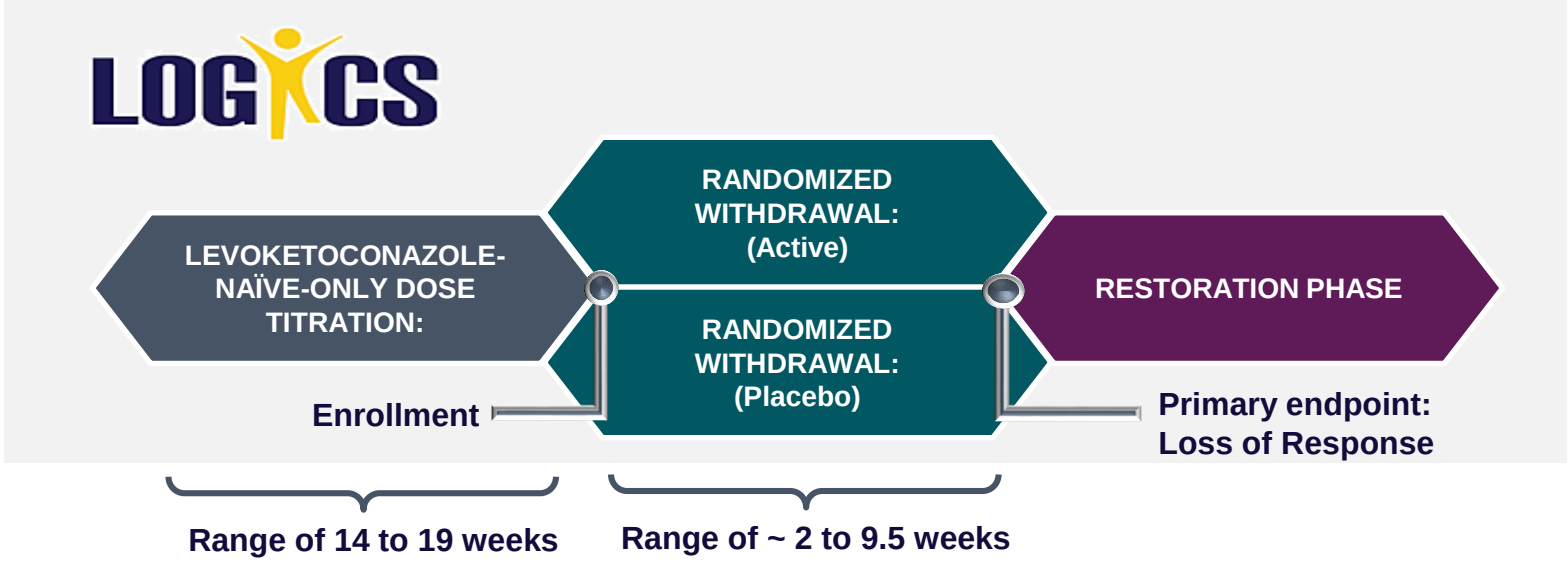
*Includes all alanine aminotransferase (ALT) increases reported as an adverse event regardless of level or relationship to drug. A subset of these ALT increased events was also reported as adverse events of special interest.

Liver safety findings in context (full study, 12 months)

- 3.2% of patients had an ALT elevation >5x ULN
- 10.6% of patients had an ALT elevation >3x ULN (includes those greater than 5x ULN)
  - All occurred on or before day-60 visit of maintenance
  - All were reversible upon discontinuation without clinical sequelae
- No transaminases >20 x ULN and no bilirubin values >1.5x ULN
- LFT monitoring scheme in SONICS
  - At least once every two weeks during dose titration; monthly for six months after the therapeutic dose was established; every three months thereafter
- Liver safety indirect comparison with ketoconazole registry study data*
  - Of 47 keto-naïve patients, 13% had an ALT elevation > 5x ULN

* Source: 1. Young et al. Eur J Endocrinol. 2018 Feb 22. pii: EJE-17-0886. doi: 10.1530/EJE-17-0886. [Epub ahead of print]

LOGICS Phase 3 trial



Design: Double-blind, placebo-controlled, randomized-withdrawal study intended to assess the efficacy and safety of Recorlev

Primary endpoint - Comparison of the proportion of subjects with loss of therapeutic response upon withdrawing to placebo versus continuing treatment with Recorlev

LOGICS Phase 3 trial enrollment & projection

- Enrollment (as of November 5, 2019)
  - Approximately two-thirds enrolled towards target of 46-54
  - Projections indicate all patients required to complete enrollment have been identified, with most in titration-maintenance and the remainder in screening
- Projection
  - Power of at least 98%
  - An observed difference of at least 35% in the loss of response proportions between the active and placebo groups is projected to be associated with a statistical inference of efficacy
- Top-line results anticipated in Q2 or Q3 2020
- NDA submission ~6 months following reporting of top-line results
  - Pursuing 505(b)(2) approval pathway for a new active substance

Cushing's syndrome represents a commercial opportunity where patients are in need of new treatment options

Market Potential

- **Estimated diagnosed and pharmacologic treated population**
  - ~25,000 CS diagnosed patients
  - ~8,000 patients Rx Treated
    - ~3,200 patients are treated and remain uncontrolled

Unmet Need

- **Unmet need centered around both efficacy and safety**
  - General lack of satisfaction with current treatment options
  - Hope for products with better efficacy, predictable treatment response and cortisol management
  - Need for safer options, in particular liver tolerability issue

Recorlev Profile

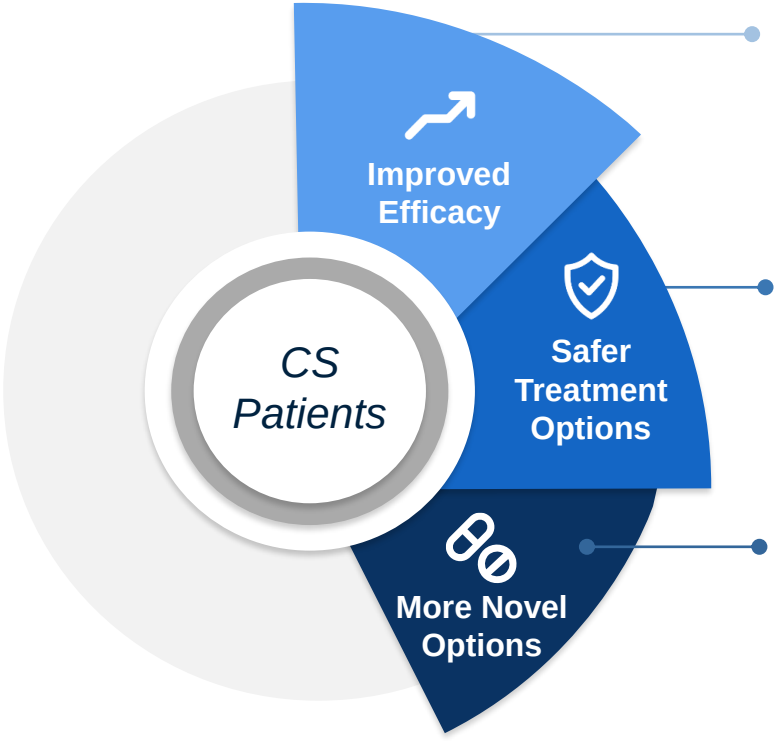
- **Sonics profile resonates with treating HCP's**
  - Product differentiation from well-characterized risk/benefit profile and substantial clinical evidence
  - Moderate – to – high interest in prescribing Recorlev
  - Top attributes align with HCP identified unmet needs

Pricing and Reimbursement

- **Payers generally positive towards Recorlev**
  - Established rare disease pricing corridor exists within Cushing's syndrome market
  - Payers generally had a positive view of the Recorlev profile
  - Assuming relative price parity with leading brand, payers expect to cover Recorlev within existing cost control frameworks

Source: Company-sponsored research

Unmet needs center around efficacy and safety



Initial Market Assessment Findings	*Unmet Need*
There is a desire for products with better efficacy, predictable treatment response and cortisol management	✓ *High*
There is a need for safer products given concerns with liver tolerability issues and other side effects associated with current treatments	✓ *High*
There are not enough treatment options available; cycling through medication is high in the CS population	✓ *High*

Source: Company-sponsored research

Recorlev anticipated to be differentiated from ketoconazole

	Recorlev	ketoconazole
Indication	Anticipated labeling for the treatment of CS	Indicated as a last line anti-fungal; FDA admonition of use in CS
Clinical data	Well characterized in two Phase 3 clinical trials	Not well-studied prospectively in CS
Liver safety	In SONICS, 3.2% of patients had an ALT elevation >5x ULN	In a registry study* of 47 keto-naïve patients, 13% had an ALT elevation > 5x ULN
Liver monitoring scheme	In SONICS, measured at least 1x every 2 weeks during dose titration; monthly for 6 months after therapeutic dose is established; every 3 months thereafter	FDA label indicates weekly liver monitoring
Patient & prescriber support	Planned specialty pharmacy distribution with expertise in Recorlev pharmacology and labeled monitoring scheme	Typically no specialty pharmacy of patient services available
Dosage & administration	SONICS/LOGICS studied doses from 150 mg once daily up to 600 mg twice daily	400-mg max dose, 200-mg strength, once daily; limited 6-month course

* Source: 1. Young et al. Eur J Endocrinol. 2018 Feb 22. pii: EJE-17-0886. doi: 10.1530/EJE-17-0886. [Epub ahead of print]

Pricing and reimbursement

- Pricing
  - Rare disease pricing corridor exists for CS
  - Current CS branded therapies are priced from $165k to $335k annually
    - Can reach up to $669k for higher dosing levels
  - Branded agents have fairly broad payer coverage
- Reimbursement
  - Largest insurance group for CS treated patients is commercial
  - Broad coverage for branded agents across insurance plans, typically on non-preferred or specialty tiers with prior authorization
  - CS is not an actively managed therapy area for payers today
  - Payers generally view Recorlev profile favorably

Source: Company-sponsored research

Existing commercial infrastructure

Company's existing commercial infrastructure may accelerate Recorlev's time to peak penetration

Fully operational patient services, including specialty pharmacy and patient access managers; significant reimbursement experience

Established relationships with Cushing's syndrome advocacy groups

6 field-based medical science liaisons focused on disease awareness and education with endocrinology KOLs

Keveyis

(dichlorphenamide)

The first and only FDA-approved therapy for primary periodic paralysis*

* FDA-approved treatment for hyperkalemic, hypokalemic, and related variants of primary periodic paralysis

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Primary periodic paralysis: a spectrum of rare, chronic, genetic, neuromuscular disorders

PPP	Symptoms/triggers	Impact of attacks	Frequency
Causes recurrent, progressive, and debilitating episodes of muscle weakness and temporary paralysis[2-4]	Symptoms: clumsiness, extreme fatigue, weakness, palpitations, pain Triggers: may include potassium, carbohydrates, rest after exercise, cold exposure, stress	Paralytic attacks are acute episodes that can be debilitating[4] Attacks may last from one hour to several days[1] As patients age, muscle weakness can become permanent[3]	**59%** have **weekly** attacks **28%** have **daily** attacks

Sources: 1. Charles G, Zheng C, Lehmann-Horn F, Jurkatt-Rott, Levitt J. Characterization of hyperkalemic periodic paralysis: a survey of genetically diagnosed individuals. *J Neurol*. 2013;260:2606-2613. 2. Cannon SC. Channelopathies of skeletal muscle excitability. *Compr Physiol.* 2015;5:761-790. 3. Cavel-Greant D, Lehmann-Horn F, Jurkat-Rott K. The impact of permanent muscle weakness on quality of life in periodic paralysis: a survey of 66 patients. *Acta Myol.* 2012;31:126-133. 4. Sansone V, Meola G, Links TP, Panzeri M, Rose MR. Treatment for periodic paralysis. *Cochrane Database Syst Rev.* 2008; Jan 23;(1):CD005045.

Keveyis approved for the treatment of PPP in the US

- The first and only FDA-approved therapy indicated for the treatment of primary hyperkalemic and hypokalemic periodic paralysis and related variants

- Twice-daily dosing in an oral tablet formulation
  - Starting dose is 50 mg 2X daily
  - Can be titrated up to 100 mg 2X daily

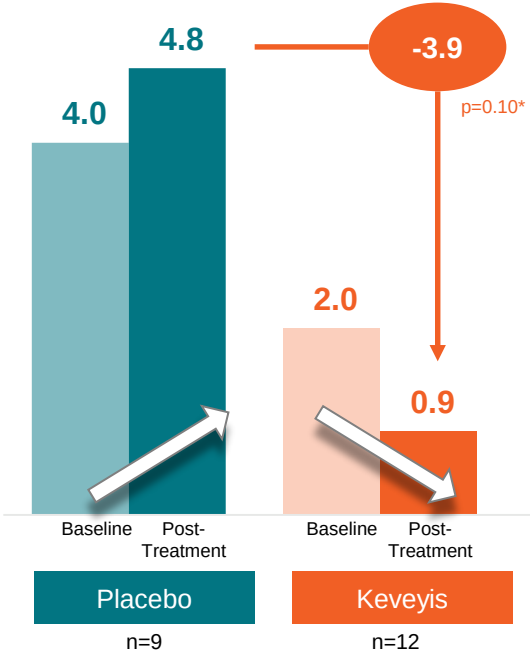
- ~4,000-5,000 diagnosed PPP patients in the United States *

* Based on Strongbridge analysis of medical claims database.
Identified patients were required to have medical activity of any type in the last 12-36 months.

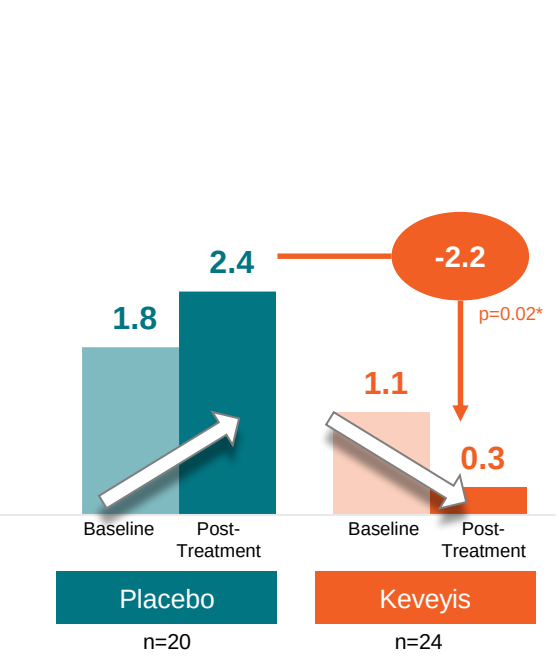
Treatment with Keveyis decreased weekly attack rates

Study 1: decreased weekly attack rates from baseline to week 9

Hyperkalemic



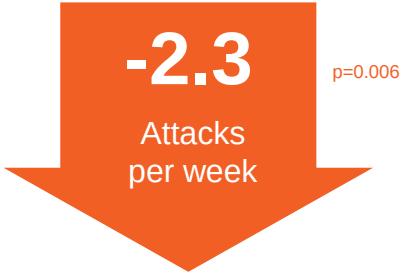
Hypokalemic



Study 2

Hyperkalemic

Mean decrease in attack rates relative to placebo



Mean weekly attack rate at baseline was 3.8 (n=31)

Study 1: Sansone VA, et al. Neurology 2016;86:1408-1416
Study 2: Tawil R, et al. Ann Nuerol. 2000; 47:46-53.

*Treatment effects (DCP-placebo) are computed as the median of the bootstrap distribution of the treatment group difference in median response

Our commitment to primary periodic paralysis

Suite of patient services

Personalized Support

Access Assistance

Education & Public Awareness

STRONGBRIDGE™ CareConnection

Community Connection

Uncovering Periodic Paralysis

Genetic Testing

Strategic priorities & revenue guidance

Achieved positive contribution margin; continue to drive revenue growth with focused financial resources to increase product profitability

Pursue life cycle opportunities to extend exclusivity runway beyond 2022; update to be provided in 1H 2020

First three quarters of 2019 revenue: $16.1M
On-track to meet or exceed the top end of full-year revenue guidance of $18 million to $20 million

IP & Financials

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Intellectual property and orphan exclusivity

	IP		Orphan exclusivity	
	US	EU	US	EU
Recorlev	2030 Method of use: reducing CRP levels and systemic inflammation 2026 Method of use: treating Cushing's syndrome	2026 Method of use: treating Cushing's syndrome	7 years	10 years
Veldoreotide	2037 Formulation	Filed patent application for novel formulation	7 years	10 years
Keveyis	Exploring options	US rights only	Aug 2022	US rights only

Financial highlights (as of 9/30/2019)

- ~$79.6 million in cash; no debt
- ~54.2 million shares outstanding
- Cash runway through 2Q 2021
- $6M payment anticipated in 4Q 2019 in connection with the termination of Strongbridge's agreement with Novo Nordisk for the promotion of Macrilen™ in the U.S.
- On-track to meet or exceed the top end of full-year Keveyis revenue guidance of $18 million to $20 million
- Evaluating cash savings initiatives to further extend cash runway

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