LIPOCINE®

ENHANCING HEALTH

Enabling Oral Drug Delivery to Improve Patient Compliance

Corporate Presentation

September 23, 2019

Forward-Looking Statements

This presentation contains forward-looking statements about Lipocine Inc. (the "Company"). These forward-looking statements are made pursuant to the safe harbor provisions of the Private Securities Litigation Reform Act of 1995. These forward-looking statements relate to the Company's product candidates, FDA review process related to our resubmitted NDA for TLANDO™, the expected timing of Phase 3 trials for TLANDO XR and Phase 2 studies for LPCN 1144 and LPCN 1148, clinical and regulatory processes and objectives, potential benefits of the Company's product candidates, intellectual property and related matters, all of which involve known and unknown risks and uncertainties. Actual results may differ materially from the forward-looking statements discussed in this presentation.

Accordingly, the Company cautions investors not to place undue reliance on the forward-looking statements contained in, or made in connection with, this presentation. Several factors may affect the initiation and completion of clinical trials and studies, the potential advantages of the Company's product candidates and the Company's capital needs. The forward-looking statements contained in this presentation are qualified by the detailed discussion of risks and uncertainties set forth in the Company's annual report on Form 10-K and other periodic reports filed by the Company with the Securities and Exchange Commission, all of which can be obtained on the Company's website at www.lipocine.com or on the SEC website at www.sec.gov. The forward-looking statements contained in this document represent the Company's estimates and assumptions only as of the date of this presentation and the Company undertakes no duty or obligation to update or revise publicly any forward-looking statements contained in this presentation as a result of new information, future events or changes in the Company's expectations.

Lipocine Investment Highlights

Near Term TLANDO PDUFA with a Promising Pipeline

"Best In Class" TLANDO Franchise

Potential to be a TRT market leader in need of an oral option

- **TLANDO™**: ~$2B+ opportunity in an established and growing market
- Significant unmet need for an oral TRT
- Differentiated product profile with potential for market expansion
- Favorable market dynamics
- **TLANDO XR (QD)**: Unique long acting oral with potential to expand market/ maintain leadership

Oral testosterone targeted for Pre-Cirrhotic/Cirrhotic NASH (unmet need with no approved drug)

Most male NASH patients have low testosterone with signs and symptoms of hypogonadism

- **LPCN 1144**: A differentiated oral modality with potential for mono/combo pre-cirrhotic NASH therapy
- **LPCN 1148**: Targeting cirrhotic NASH

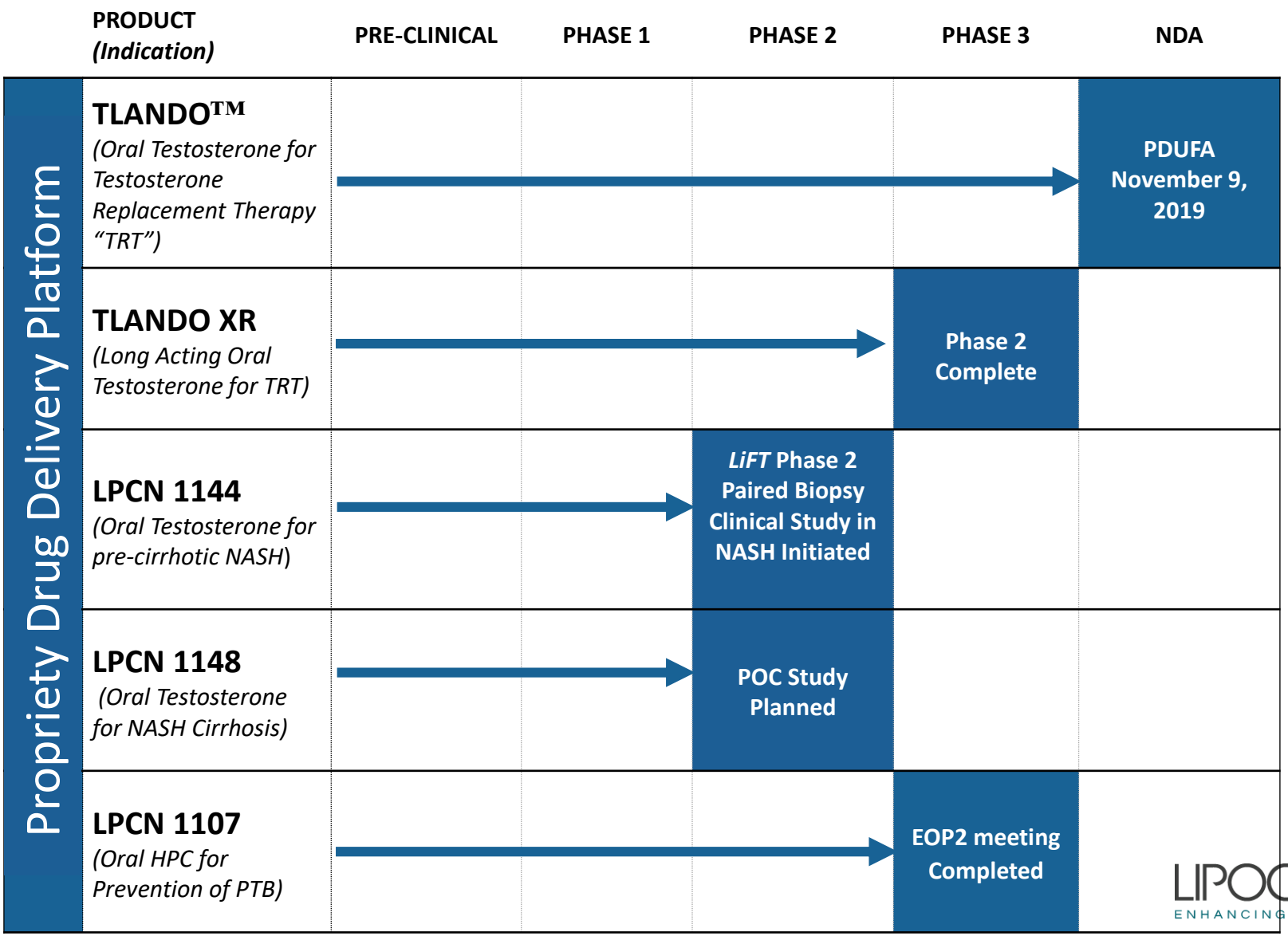
Orphan designated candidate for the prevention of preterm birth

- **LPCN 1107**: First oral alternative

LIPOCINE® ENHANCING HEALTH

Clinical Stage Biopharmaceutical Company

Innovative Product Candidates for Metabolic and Endocrine Disorders



LIPOCINE® ENHANCING HEALTH

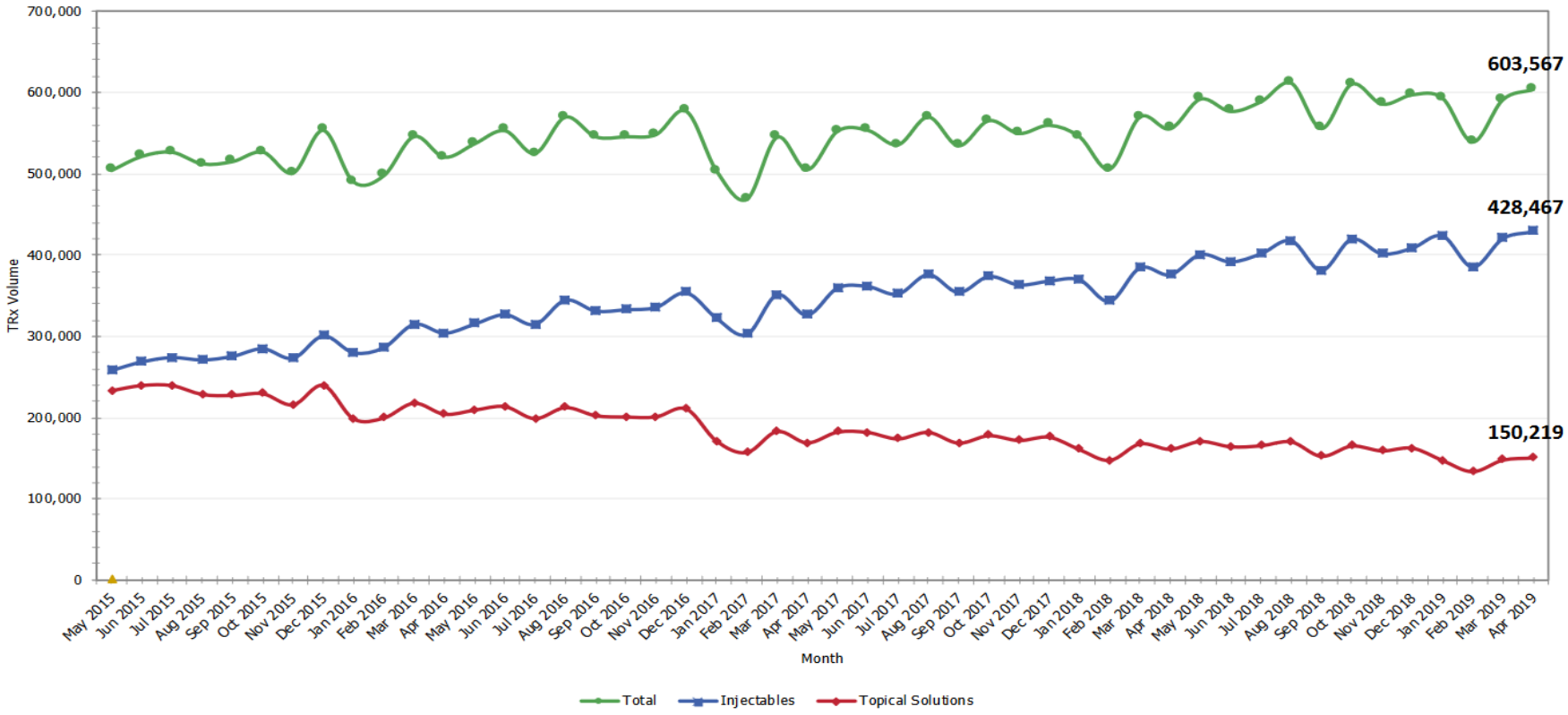
LIPOCINE®
ENHANCING HEALTH

TLANDO™

~$2B+ opportunity in an established and growing market

TRT Market is Growing Without an Oral Option

Current Promotional Spend at an All-Time Low



Source: Antares Pharma presentation at JEFFERIES 2019 HEALTHCARE CONFERENCE
TRx = Total prescriptions

LIPOCINE® ENHANCING HEALTH

Issues with Current Non-oral TRT Options

Significant Need for an Oral TRT Option

- **Black Box Warning**
  - Secondary exposure to testosterone
  - Pulmonary oil micro embolism (POME) and anaphylaxis shock
- **Inconvenient application or painful injection**
- **Poor persistence reflects need for oral**
  - Discontinuation rates as high as 50% among new patients after only 30 days with topicals
- **More than 50% of patients need dosage adjustment**
  - Burdensome for patients due to multiple doctor visits

LIPOCINE® ENHANCING HEALTH

TLANDO™ Attributes

Patient and Physician Preferred Option

Convenient Oral Route:

- No risk of accidental T transference
- Non-invasive; easy to use
- Less cumbersome/burdensome
- Potential for higher persistence/adherence

Fixed Dosing Regimen

- Easy to use for patients and physicians to prescribe
- Unlike most TRT products, fixed “right” dose from the start of therapy with TLANDO™ for all patients
- No additional dose adjustment visits
- Not prone to titration decision errors; No risk of patients stuck on wrong dose
- Fixed/predictable cost for payers with no titration

Differentiated Hypertension (“HTN”) Profile

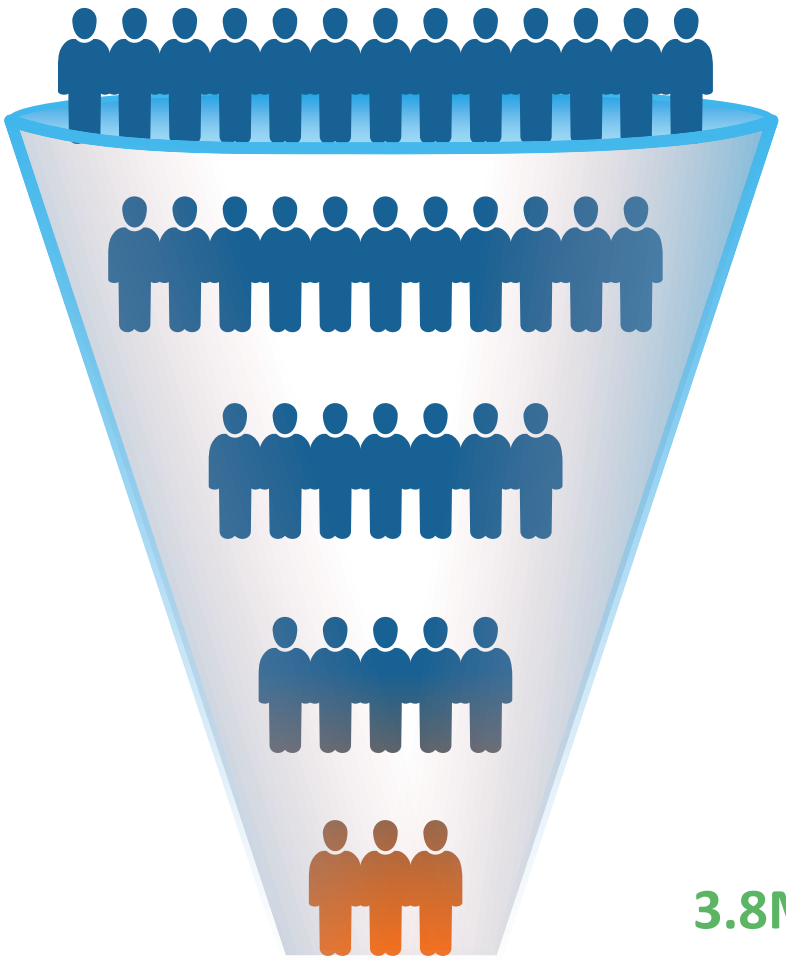
- Marginal (~ 1%)new anti-HTN starts or increase in anti-HTN dose in a year long exposure
- Lower incidence of hematocrit increase as compared to injectables

Consistent Inter-Day Restoration of T Levels

Demonstrated Paradigm Shifting Liver Benefits

TLANDO™ Has The Potential to Drive Market Expansion

Hypogonadism Affects Up to 20 MM American Men[1,2]



6MM Men with diagnosed hypogonadism[3]

2.2MM Men currently being treated[4]

1.5MM Available switch patients

700,000 Available naïve patients per year[5]

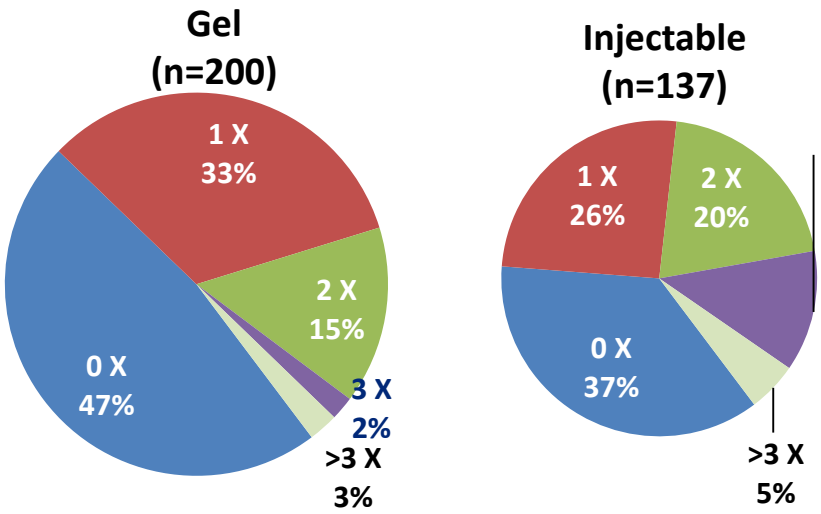
3.8MM diagnosed but untreated patients

1. US Census data. http://www.infoplease.com/us/census/data/demographic.html. 2. Mulligan T, et al. Int J Clin Pract. 2006 Jul;60(7):762-9. 3. Araujo, et al. J Clin Endo Metabol 2007. 92(11):4241-7. 4. Symphony Healthcare 2014 for FDA Advisory Meeting. 5. IMS Health Sept 2015.

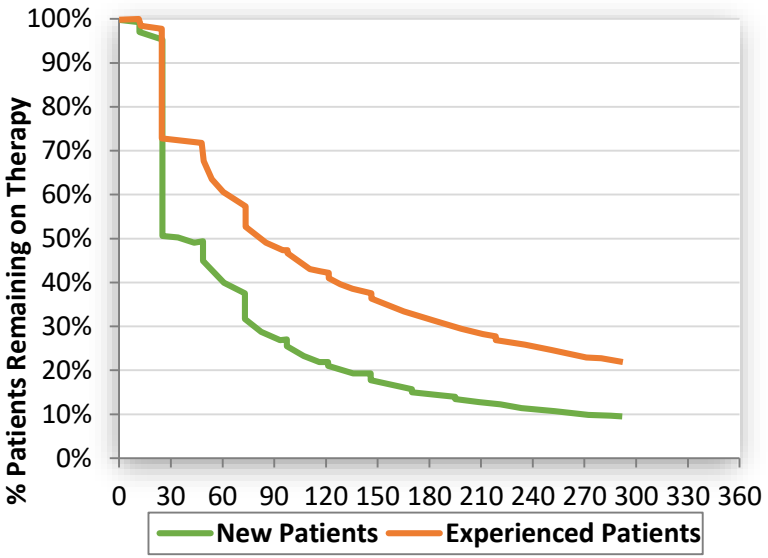
LIPOCINE® ENHANCING HEALTH

TLANDO Has Potential to Expand the Market Through Improved Persistence

Some TRT Options Have ~50% Early Discontinuation and ~50% May Require Multiple Dose Adjustments



Number of Current TRT Dose Adjustments by Form*



Patient Group	% Persistent Patients		
	Day 30	Day 180	Day 360
New	50.8%	18.0%	9.2%
Experienced	73.0%	36.7%	21.9%

Cohort Period: February 2016 – January 2017
Analysis Period: 12 Months
Look Back: 6 months for new patients

* Current TRT n=412
Q16. Since you started using your current testosterone medication, how many times was the dose adjusted up or down until you reached your current dose level?

Source: Adheris Health 2017

LIPOCINE® ENHANCING HEALTH

Current Market Dynamics in TRT Space

Prime Opportunity for TLANDO™

Patient and physicians preferred[1]	• 85% of physicians have strong interest in oral • 95% of TRT patients likely to ask their doctor about TLANDO™
Current promotional spend all time low in this detail sensitive category[2]	• Able to have high share of voice with far less competitive promotion than in the past
Concentrated call points[3]	• Decile 7-10 prescribers (~ 10,000) write 40% of the Scripts
Detail sensitive category	• Novel convenient oral option
Recent injectable TRT launch data[4]	• Significant early weekly script trends and growing • ~45% of TRx from new patient starts

1. Lipocine Market Research; 2. iVH Research & Insights; 3. Prescriber Profiler 2019;.4. Antares Pharma presentation at JEFFERIES 2019 HEALTHCARE CONFERENCE

LIPOCINE®
ENHANCING HEALTH

TLANDO™ - Opportunity in a Market Ready for Change

PDUFA goal date: November 9, 2019

TLANDO™
(testosterone undecanoate)
112.5 mg oral capsule CIII

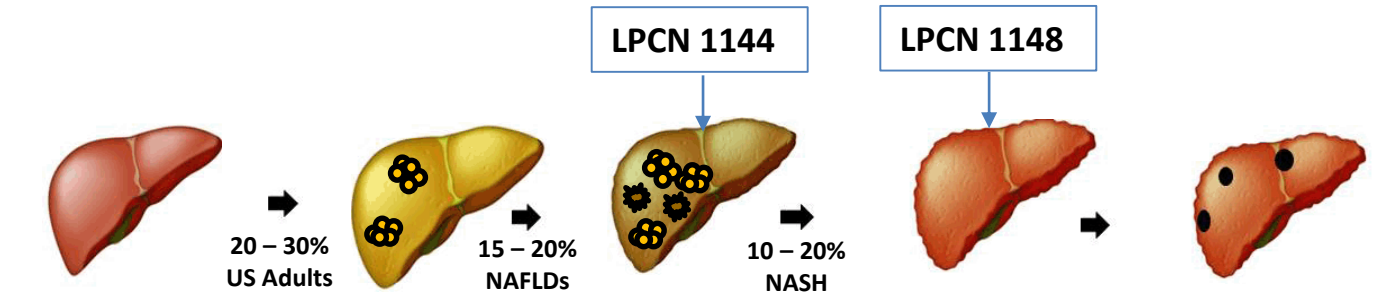
- ~$2B+ opportunity in an established and growing market
- Significant unmet need for an oral TRT
- Differentiated profile appropriate for market expansion
- Favorable market dynamics
- Potential for market leadership

LIPOCINE® ENHANCING HEALTH

Non-Alcoholic Fatty Liver Disease ("NAFLD")

No Approved Product for the Treatment of NAFLD/NASH

Fatty liver is a reversible condition wherein large vacuoles of triglyceride (TG) fat accumulate in liver cells via the process of steatosis



Majority of NASH patients have low testosterone levels[1]

LFTs: Liver function test, especially Alaninine amino transferase (ALT) and Aspartame amino transferase (AST)
NASH: Non-alcoholic Steatohepatitis, TG: Triglyceride

1. Sarkar et al. Gastroenterology 156(6):S-1258 & Poster Sa1623 Digestive Disease Week 2019

LIPOCINE® ENHANCING HEALTH

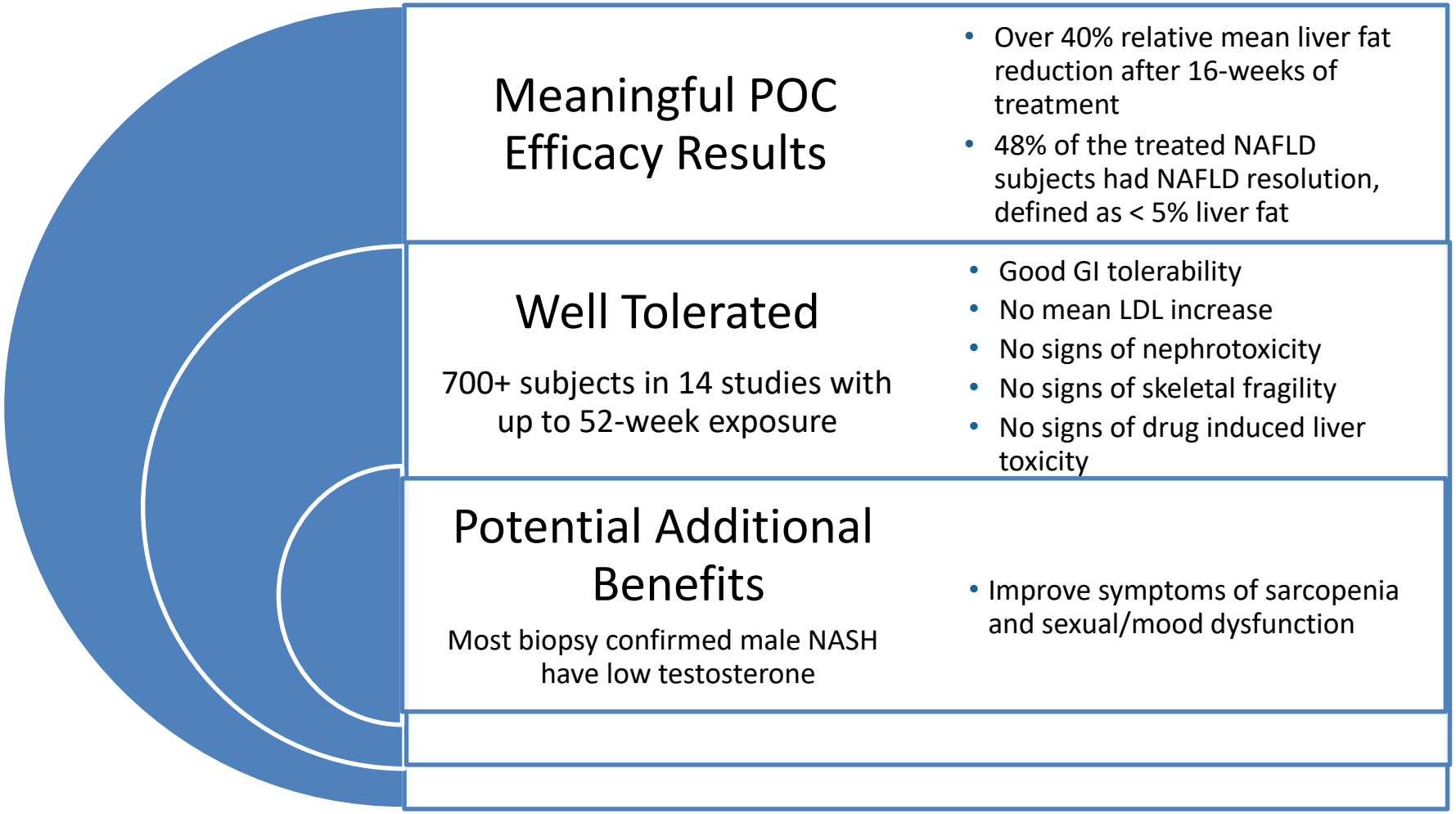
LIPOCINE®
ENHANCING HEALTH

LPCN 1144

Targeted for Non-Alcoholic Steatohepatitis (“NASH”)

LPCN 1144: Differentiated NASH Treatment Candidate

Potential for Mono/Combo Chronic Therapy

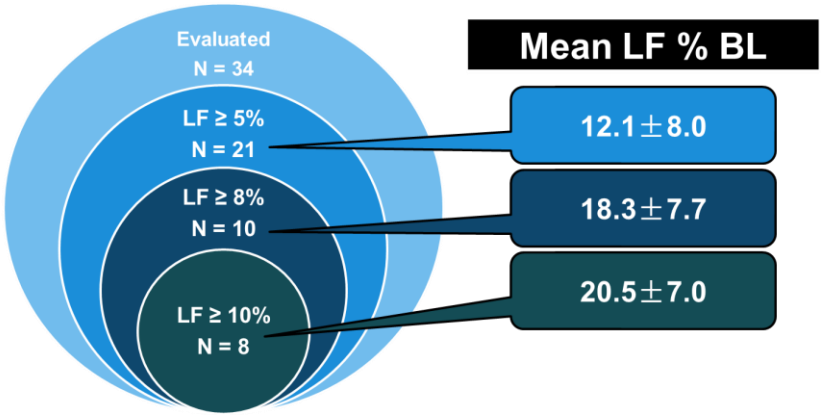


LIPOCINE® ENHANCING HEALTH

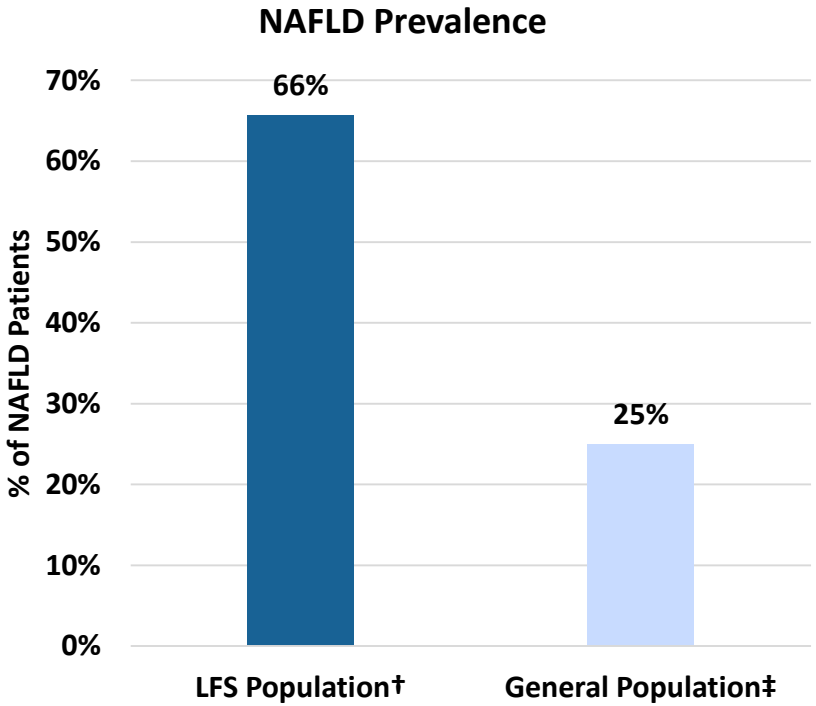
LPCN 1144: Liver Fat Imaging Study ("LFS")

Over Sixty Percent of Hypogonadal Subjects had Fatty Liver (LF>5%)

LFS was an open-label, multi-center single-arm 16-week study (N=36) with LPCN 1144 in hypogonadal males



LF = liver fat



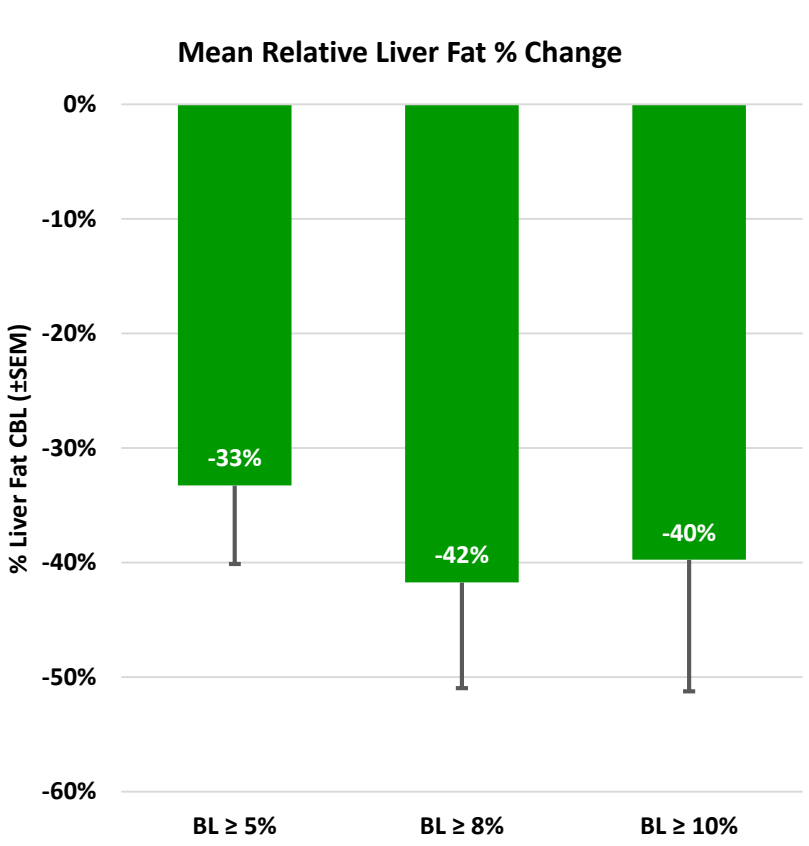
† NAFLD identified by MRI-PDFF ≥ 5% in LPCN 1144 Liver Fat Study

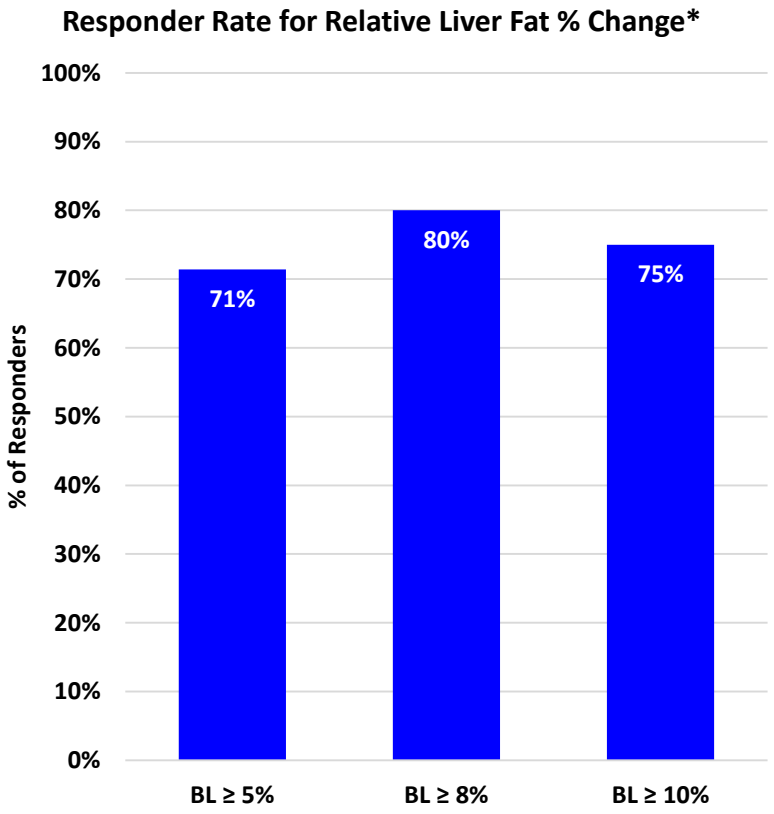
‡ Prevalence of NAFLD diagnosed by imaging hepatosteatosis ≥ 5% liver fat in general population (Younossi et al, J Hepatol 2016)

LIPOCINE® ENHANCING HEALTH

LPCN 1144: Liver Fat Study Results

Meaningful Relative Liver Fat % Change and Responder Rate





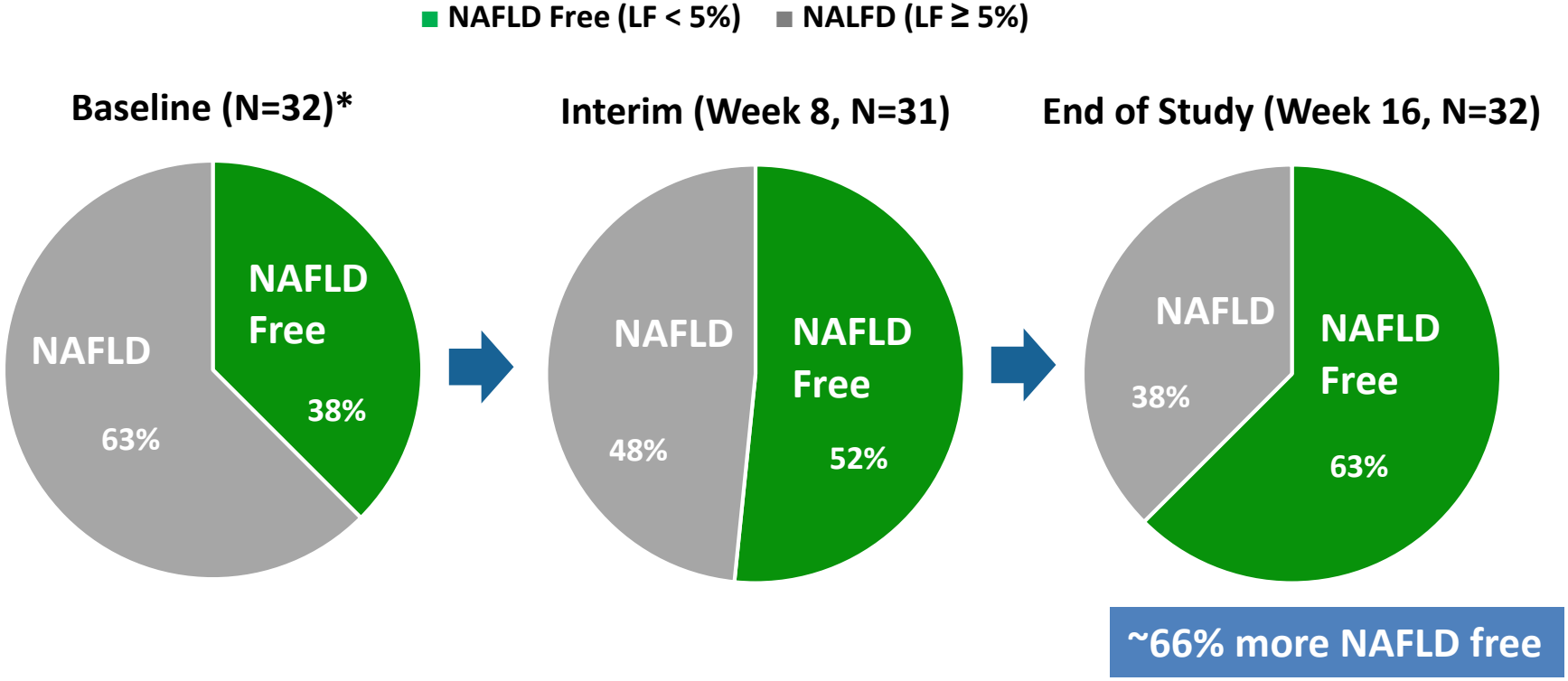
* Responder rate for relative change is % of patients with at least 30% for relative change from baseline.

LIPOCINE® ENHANCING HEALTH

LPCN 1144: Longitudinal Treatment Effect

Continued Improvement with NAFLD Resolution Over Time

Liver Fat Based Subject Distribution at Each Visit



~66% more NAFLD free

* Full Analysis Set (FAS)

LIPOCINE® ENHANCING HEALTH

LPCN 1144: Next Step

Advancing Forward

- *LiFT* (Liver Fat intervention with oral Testosterone) Phase 2 paired-biopsy Phase 2 clinical study in NASH subjects – Initiated
  - Study Design
    - Three-arm, double-blind placebo controlled
    - ~75 biopsy confirmed NASH male subjects with NAS ≥ 4
    - Paired biopsy at baseline and EOS (36-weeks)
    - Primary endpoint – 12-week MRI-PDFF liver fat reduction
  - First-patient dosing expected in 3Q 2019

Upcoming Milestones

Near Term Value Drivers

	Event	Expected Timing
TLANDO™	PDUFA Date	**November 9, 2019**
LPCN 1144	*LiFT* Phase 2 Paired Biopsy Clinical Study in NASH Subjects - First Patient Dosed	**3Q 2019**
	Primary Endpoint Results (Liver Fat Reduction via MRI-PDFF)	**Mid-2020**
LPCN 1148	File Investigational New Drug Application	**December 2019**

Key Financial Metrics

Stock Price, Market Cap, Cash Balance

Ticker Symbol	**LPCN (Nasdaq Capital Market)**
Closing Stock Price (9/19/19)	**$2.90/share**
Market Capitalization (9/19/19)	**$75.5 million**
Cash Balance (6/30/19)	**$19.5 million***
Bank Debt (6/30/19)	**$8.7 million**

* $5M restricted and becomes unrestricted upon TLANDO approval

LIPOCINE®
ENHANCING HEALTH

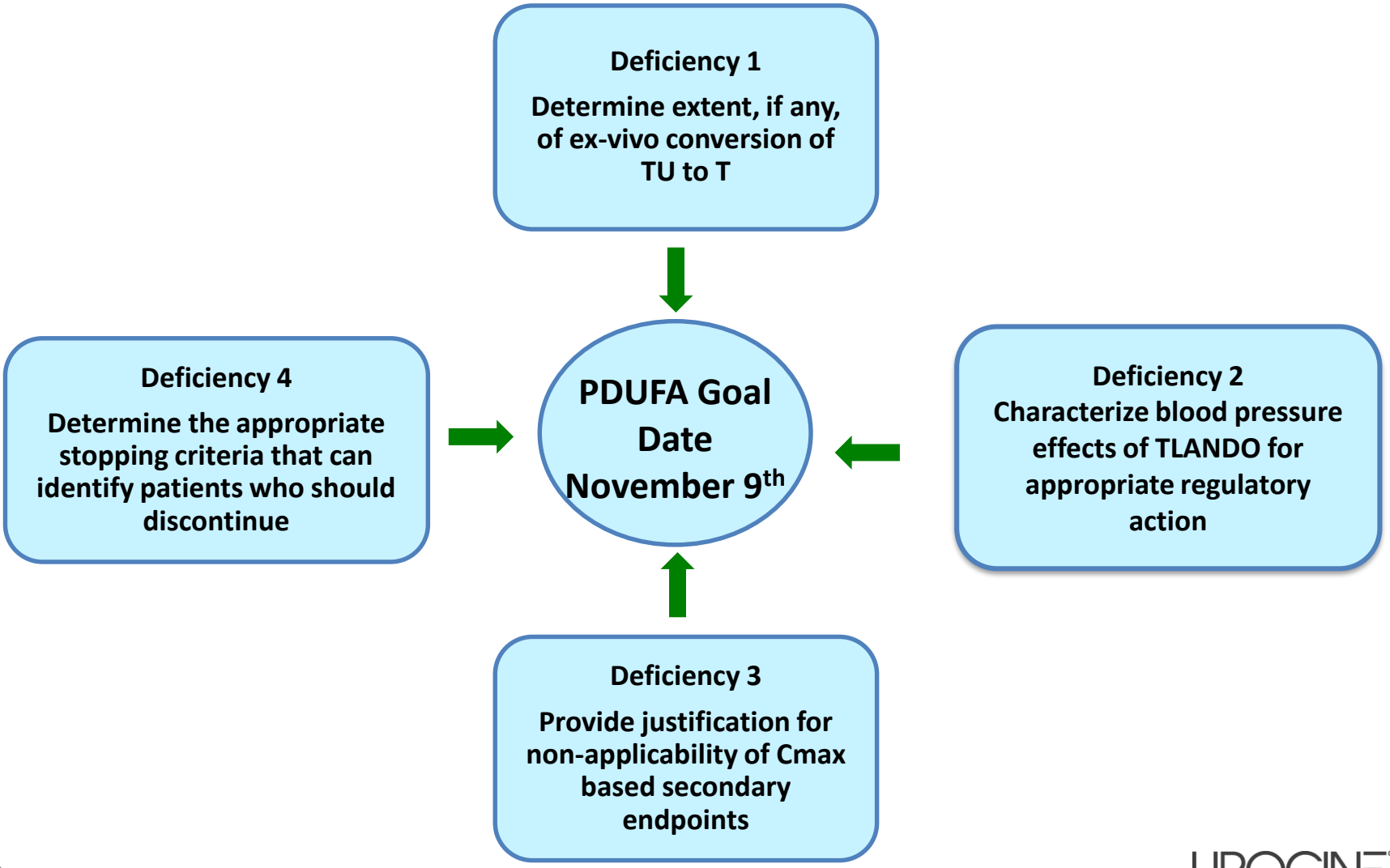
Appendix

LIPOCINE®
ENHANCING HEALTH

TLANDO™

TLANDO™: NDA Under Review

Near Term FDA Decision



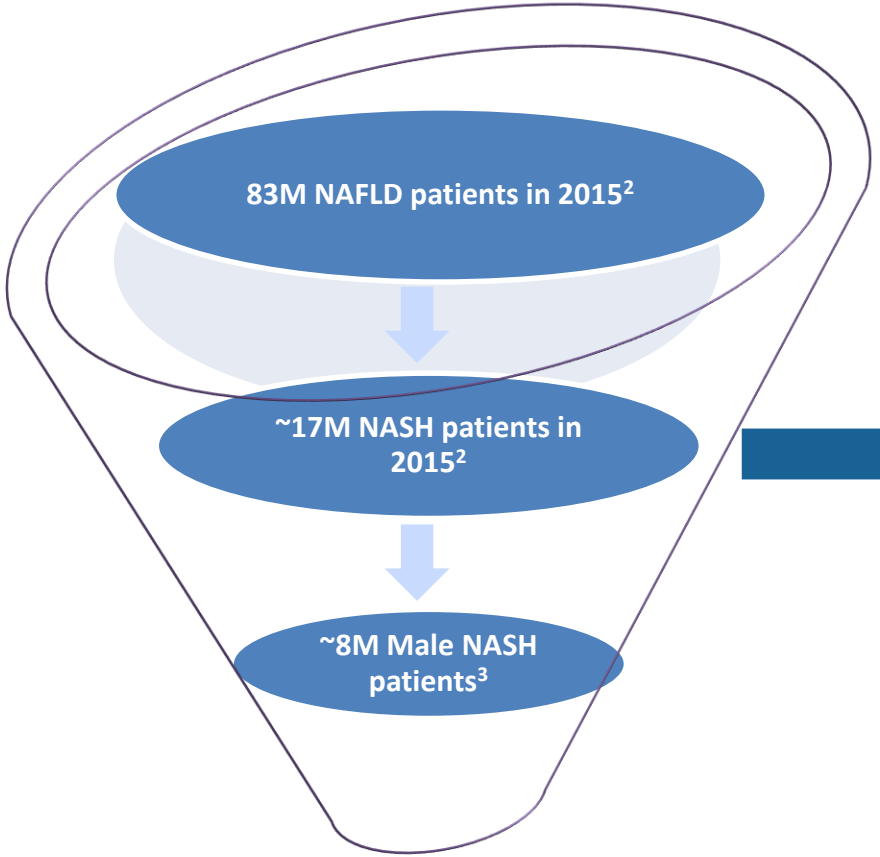
LIPOCINE® ENHANCING HEALTH

LIPOCINE®
ENHANCING HEALTH

LPCN 1144

Estimated LPCN 1144 Target Market

Reportedly 75% of NASH Male Patients Have Total T less than 372 ng/dL[1]



NASH cases are projected to increase 63% from 17 million cases in 2015 to 27 million cased in 2030[2] with no approved drug

FDA agreed with Lipocine rationale for enrolling eugonadal males in LPCN 1144 testing in NASH subjects

1. Sarkar et al. Gastroenterology 156(6):S-1258 & Poster Sa1623 Digestive Disease Week 2019
2. Estes et al, Hepatol 2018)
3. About 50% of males are accounted in the whole NASH population.

LIPOCINE® ENHANCING HEALTH

LPCN 1144: Multidimensional Mechanism of Action

Across the Full Spectrum of NASH Pathogenesis

Homeostasis Modifier[1, 2]	Anti-inflammatory[2]/ Antioxidant/Immuno-modulator[3]	Regeneration Booster[5,6]	Anabolic Agent[9]
• Alter lipid, cholesterol, and glucose metabolism • Reduce visceral abdominal fat • Modify activity of hepatic lipase, and skeletal muscle/ adipose lipoprotein lipase	• Restore mitochondrial turnover and normalizes oxygen consumption[4]	• Stimulate satellite cells and myocyte precursor resulting in cell differentiation and myocyte proliferation[7] • Increases circulating endothelial progenitor cells ("EPC") [8]	• Increase muscle mass, bone density in men with liver disease[10]

1. Shen and Shi, Int J Endocrinol, 2015
2. Kelly and Jones, J Endocrinol, 2013
3. Sinclair et al., J Gastroenterol Hepatol, 2015
4. Linda Vignozzi et al., University of Florence, IT, unpublished, 2018
5. A. Francavilla et al., Digest Dis Sci, 1989
6. Vic et al., Hepatol 1982
7. Sinha-Hikim et al., J Clin Endocrinol Metab, 2004
8. Liao CH et al., Andrology, 2013
9. Gentile MA et al., J Mol Endocrine, 2010
10. Sinclair et al., J Gastroenterol Hepatol 2016

LIPOCINE® ENHANCING HEALTH

Unmet Need in Pre-Cirrhotic NASH

Currently No Approved Product to Treat Pre-Cirrhotic NASH

Rationale for Using LPCN 1144 Alone or in Combination to Treat Pre-Cirrhotic NASH

- Multi-dimensional mechanism of action/efficacy across the full NASH disease spectrum
- Tolerable and suitable for chronic use
- Majority of biopsy confirmed NASH adult males have low testosterone[1]
- Sarcopenia in patients with NAFLD is associated with a higher likelihood of having steatohepatitis or advanced liver fibrosis[2]
- Sexual dysfunction is an underappreciated comorbidity in male NASH patients[3]

1.Sarkar et al. Gastroenterology 156(6):S-1258 & Poster Sa1623 Digestive Disease Week 2019
2. Dorota et al., Sex Med Rev. 2019, 1-2.
3. Yu et al. BMC Gastroenterology (2018) 18:51 https://doi.org/10.1186/s12876-018-0776-0

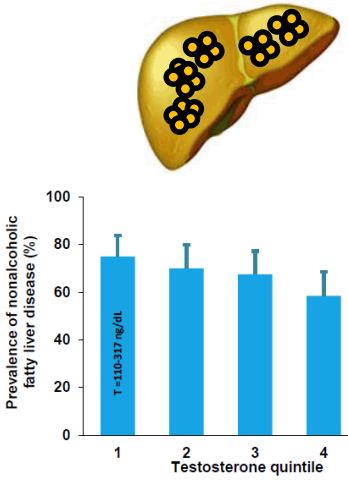
LIPOCINE® ENHANCING HEALTH

Clinical Relationship Between Testosterone and NAFLD

Across the Full Disease Spectrum

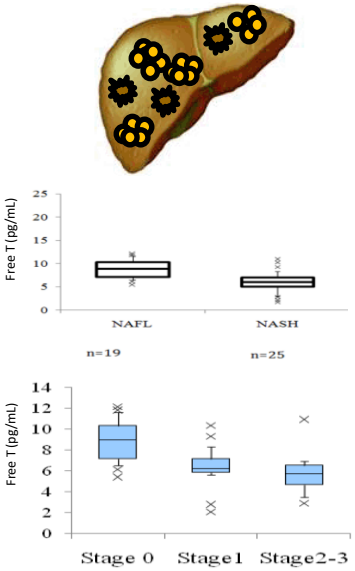
Hepatic Steatosis

"Men with low testosterone are at high risk for NAFLD." [1]



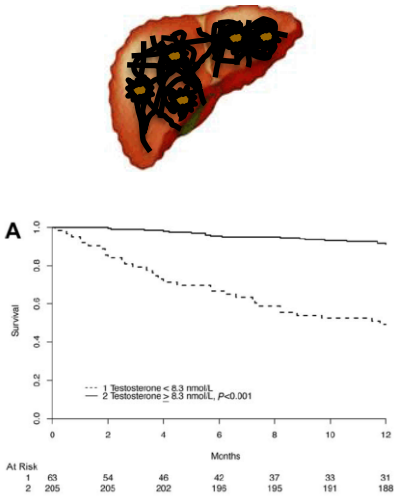
NASH

"Levels of free T decreased significantly with the increased incidence of lobular inflammation, hepatocyte ballooning, NAFLD activity score, and fibrosis." [2]



Cirrhosis

"Low T levels in cirrhotic men are associated with the combined outcome of death or transplantation." [3]

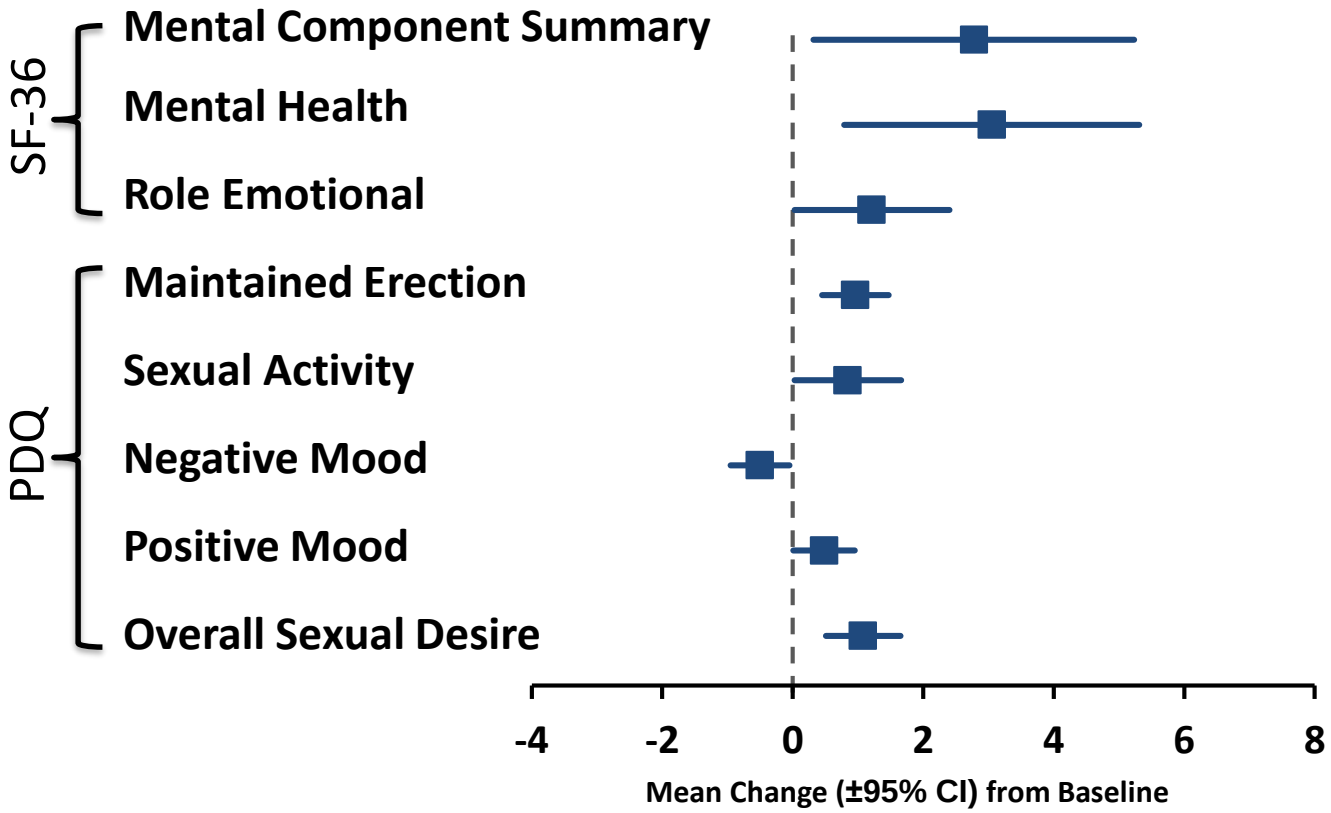


1 Kim et al, Gastroenterol 2012; 2 Sumida et al, Gastroenterol Hepatol 2015; 3 Sinclair et al, Liver Trans 2016;

LIPOCINE® ENHANCING HEALTH

LPCN 1144: Additional Health Benefits

Observed in Hypogonadal Subjects with Elevated ALT*



SF-36, Short Form-36 (0-100); PDQ, Psychosexual Daily Questionnaire (0-7); * ALT > 40 U/L at Baseline in 52 week SOAR Trial (N=33)

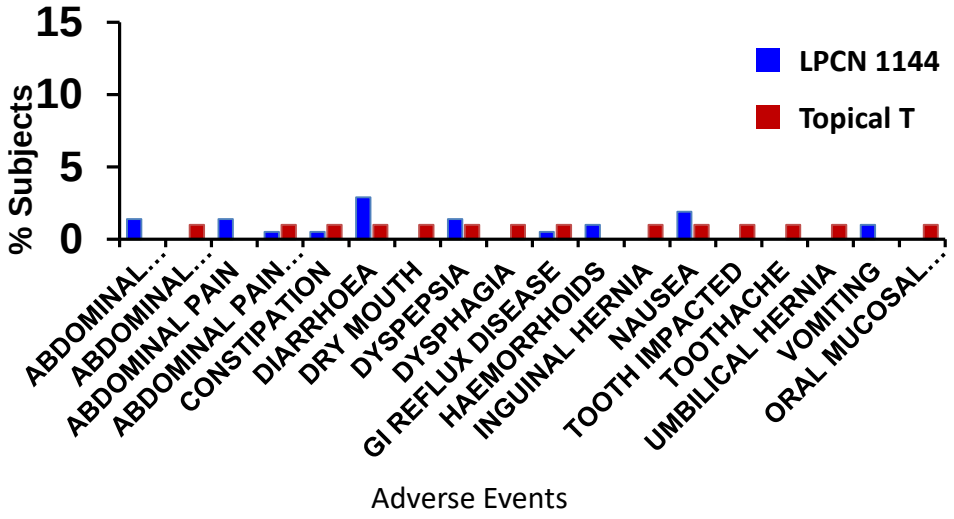
LIPOCINE® ENHANCING HEALTH

LPCN 1144: Extensive Clinical Safety Database

Demonstrated No Unexpected Risks

- 700+ subjects in 14 studies with up to 52 weeks exposure
- No drug related SAEs
- No deaths or MACE events

Gastrointestinal Disorders ≥ 1% in SOAR Trial (52 Weeks)



LIPOCINE® ENHANCING HEALTH

LIPOCINE®
ENHANCING HEALTH

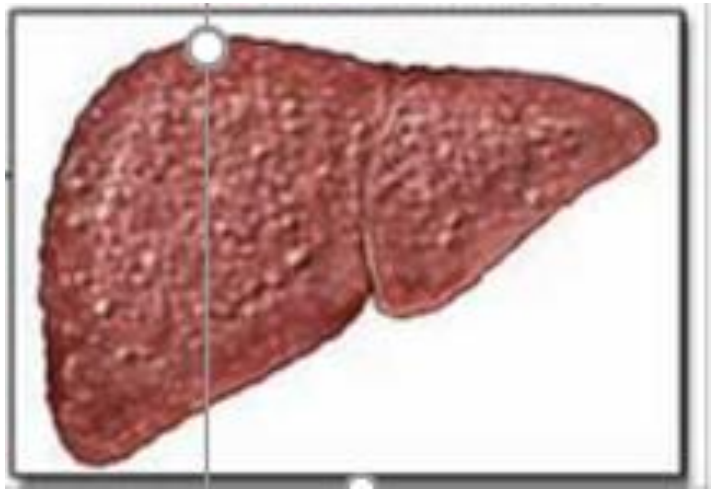
LPCN 1148

For Treatment of NASH Cirrhosis

LPCN 1148: Oral T for NASH Cirrhosis

No FDA Approved Product-Transplant Only Cure

Cirrhotic Liver



US Prevalence

Among NASH population (2015)*:

- Fibrosis grade 4 (cirrhosis) case: 1.3M
- Compensated cirrhosis 1.16M
- Decompensated cirrhosis: 134,400

In 2013, cirrhosis cause mortality was ~38,000** and consistently twice the rate in males as females **

Cirrhotic Patients Characteristics:

- Increased morbidity and mortality
- Symptoms of hypogonadism: altered hair distribution, anemia, sexual dysfunction, testicular atrophy, muscle wasting, fatigue, osteoporosis, gynecomastia
- Late stage symptoms: jaundice, pruritis, hepatic encephalopathy, ascites, anasarca, GI bleeding

*Estes C. et al., Hepatology, 2018;**Yoon and Chen, National Institute on Alcohol Abuse and Alcoholism; surveillance report, 2016

Low Testosterone Increases Adverse Outcome in Male Cirrhotic Patients

T Levels Fall Progressively with Increasing Disease Severity[1]

- Low T reported in up to 90% of NASH cirrhosis patients[2] and is a predictor of mortality[3]
- Low T associated with:
  - Increased risk of major infections, death and/ or transplantation rates[1]
  - Increased risk of for hepatic decompensation[4]
  - Worsening of sarcopenia[4]
  - Higher Child Pugh score grade[4]
  - Severity of portal hypertension and ascites grade[4]
  - Higher MELD score[5]

1. Sinclair et al., Liver Transplantation, 2016
2. Kim et al., Male Hypogonadism, edrs: Winters and Huhtaniemi, 2017
3. Sinclair M. et al., J. of Gastro and Hepatology, 2015
4. Paternostro et al, Hepatol Res 2019;
5. Sinclair et.al, Liver international, 2016

LIPOCINE® ENHANCING HEALTH

LPCN 1148: NASH Cirrhosis

Oral T Therapy

Potentially help patients survive longer while waiting for a liver transplant

- T levels positively correlate with muscle mass in men and modulates bone density, hemoglobin production, insulin resistance, and immunity , commonly impaired in cirrhosis[1]
- Testosterone therapy increased muscle mass in men with cirrhosis and low testosterone[2]
- **Next Steps:**
  - Proof of Concept study in male NASH cirrhosis subjects

1. Sinclair M et al., J. of Gastro and Hepatology, 2016
2. Sinclair M et al., J. of Hepatology, 2016