ZOSANO PHARMA

Corporate Overview

FORWARD-LOOKING STATEMENT

This presentation contains forward-looking statements. All statements other than statements of historical fact contained in this presentation, including statements regarding our commercialization, our research and other development programs, our ability to undertake certain activities and accomplish certain goals and milestones, projected timelines and costs for our research and development activities (including any clinical trials), our ability to secure and further possible regulatory approvals, the enforceability of our intellectual property rights, our capital requirements, the prospects for third-party reimbursement for our products, the expected pricing of our products, our expectations regarding the relative benefits of our product candidates versus competitive therapies, our expectations regarding the possibility of licensing or collaborating with third parties regarding our product candidates or research, our business strategy, our expectations regarding potential markets or market sizes, and our expectations regarding the therapeutic and commercial potential of our product candidates, research, technologies and intellectual property, are forward-looking statements. In some cases, you can identify these statements by forward-looking words, such as the words "believe," "may," "estimate," "continue," "anticipate," "design," "intend," "expect," "potential" and similar expressions, the negative version of these words and similar expressions and references to future quarters or years. The forward-looking statements in this presentation do not constitute guarantees of future performance. Statements in this presentation that are not strictly historical statements are subject to a number of known and unknown risks and uncertainties that could cause actual results to differ materially and adversely from those anticipated or implied in the forward-looking statements, including, without limitation, those described under the heading "Risk Factors" in our Form 10-K filed with the SEC on March 1, 2017, and new risks emerge from time to time. These forward-looking statements are based upon our current expectations and involve assumptions that may never materialize or may prove to be incorrect. Actual results and the timing of events could differ materially from those anticipated in such forward-looking statements as a result of various risks and uncertainties which include, without limitation, risks associated with the process of discovering, developing and commercializing products that are safe and effective for use as human therapeutics and risks inherent in the effort to build a business around such products. Although we believe that the expectations reflected in these forward-looking statements are reasonable, we cannot in any way guarantee that the future results, level of activity, performance or events and circumstances reflected in forward-looking statements will be achieved or occur. Any forward-looking statement made by us in this presentation speaks only as of the date this presentation is actually delivered by us in person. We assume no obligation or undertaking to update or revise any forward-looking statements contained herein to reflect any changes in our expectations with regard thereto or any change in events, conditions or circumstances on which any such statement is based, except as required by law.

The Company has filed a registration statement (including a prospectus) with the SEC for the offering to which this communication relates. Before you invest, you should read the prospectus in that registration statement and other documents the Company has filed with the SEC for more complete information about the Company and this offering. You may get these documents for free by visiting EDGAR on the SEC website at www.sec.gov. Alternatively, any underwriter or any dealer participating in the offering will arrange to send you the prospectus if you request it by contacting BTIG, LLC at 825 Third Avenue, 6th Floor, New York, NY, 10022, or by telephone at (212) 593-7555 or by e-mail at equitycapitalmarkets@btig.com.

ZOSANO PHARMA

- Large addressable market – Migraine
  - $5.4 billion in treatment costs in U.S.
  - High degree of patient dissatisfaction
- Proprietary delivery platform – ADAM™
  - ALZA / JNJ
  - Intracutaneous delivery to microvasculature
- Late stage development – M207
  - Phase I – completed and published
  - Phase II / III pivotal efficacy – completed and published
  - Phase III – LTSS ongoing – fully enrolled
  - NDA filing Q4:2019
- Improved clinical outcomes
  - Pain freedom
  - Pain relief
- Manufacturing scale up underway
- IP through 2037
- Experienced management team

ZOSANO PHARMA

Migraine Market Overview

- Migraine is the 3rd most prevalent illness in the world
- Nearly 1 in 4 U.S. households includes someone with migraine
- 12% of the U.S. population (39M)
  - 18% of women
  - 6% of men
  - 10% of children
- 25% of migraineurs experience 4 or more per month
- 1.2 million ER visits per year for acute migraine in U.S.
- 90% of migraine sufferers are unable to work or function normally
- Attacks last between 4 and 72 hours
- Economic impact of migraine in U.S.
  - Lost productivity of ~$36B
  - Treatment cost of ~$5.4B

ZOSANO PHARMA

Source: Migraine Research Foundation

Market Overview

- Migraine pain
  - Unilateral
  - Throbbing
  - Moderate to severe in intensity
  - Aggravated by physical activity
- Accompanying symptoms
  - Nausea – gastric dysfunction
  - Vomiting
  - Sensitivity to light
  - Sensitivity to sound
  - Sensitivity to smell
  - Fatigue
  - Irritability
- Pathophysiology
  - Neuronal
    - Inflammation
  - Vascular
    - Vasodilation

ZOSANO PHARMA

Market Overview Treatments

- Pain relief (acute)
  - Aspirin or Ibuprofen (mild)
  - Acetaminophen with aspirin and caffeine (mild)
  - Triptans (severe)
  - Ergots (severe)
  - Opioids (severe)
  - Glucocorticoids (in combination)
- Prevention (chronic)
  - Beta blockers
  - Calcium channel blockers
  - Anti-depressants (SSRIs)
  - Anti-seizure (valproate- topiramate)
  - BoTox
  - NSAIDS (naproxen)

ZOSANO PHARMA

Source: Mayo Clinic

Market Overview – Migraine Treatments

- Triptans
  - Most commonly prescribed
  - Dual action
    - Vasoconstriction ($5HT_{1B}$)
    - Inflammation ($5HT_{1D}$)
  - $4.8 billion market in U.S.
    - Sumatriptan (Imitrex)
    - Rizatriptan (Maxalt)
    - Almotriptan (Axert)
    - Naratriptan (Amerge)
    - Zolmitriptan (Zomig)

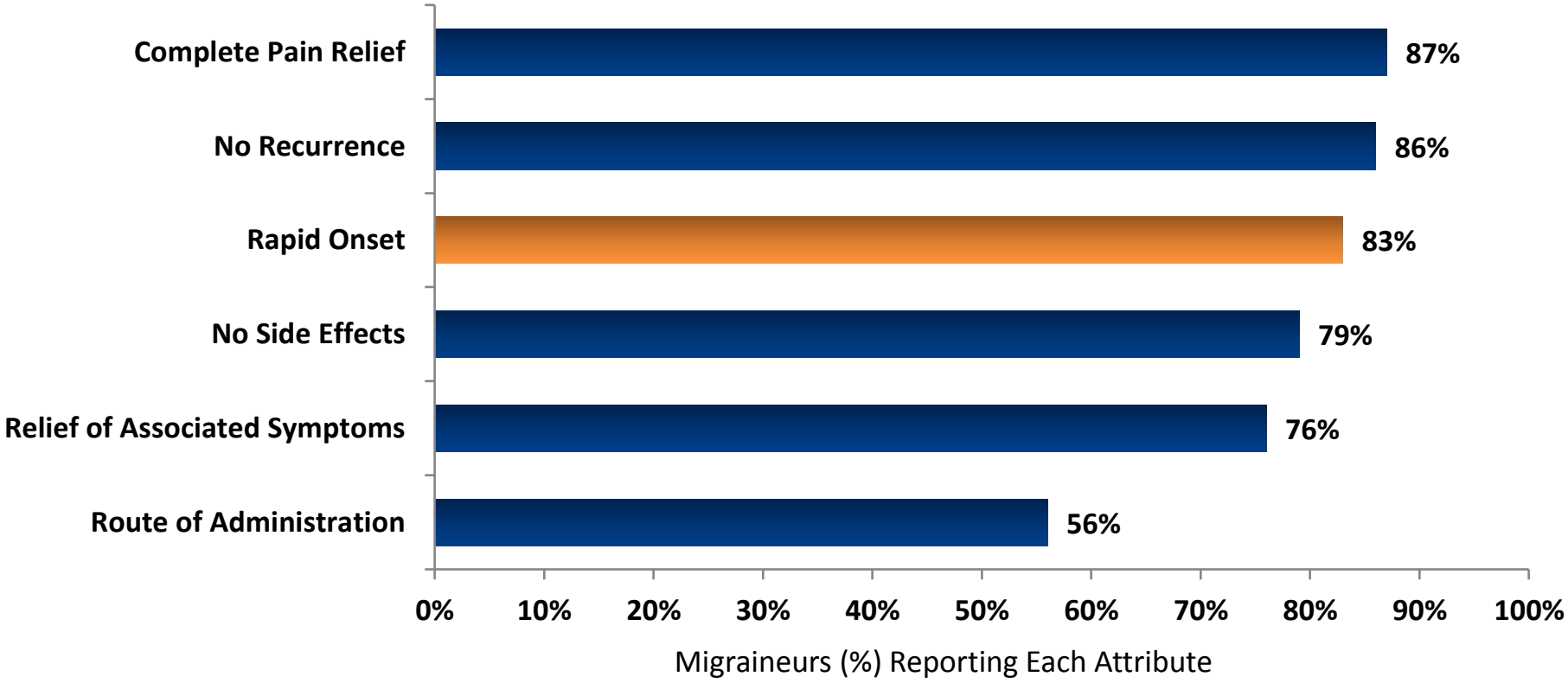
- Side Effects / Injection
  - Nausea
  - Dizziness
  - Drowsiness
  - Muscle weakness
  - Injection site reaction

- Dosage Forms
  - Oral
  - Injection
  - Nasal

ZOSANO PHARMA

Source: Mayo Clinic; Symphony Health

Target Profile
What Do Patients Want Most From an Acute Treatment?

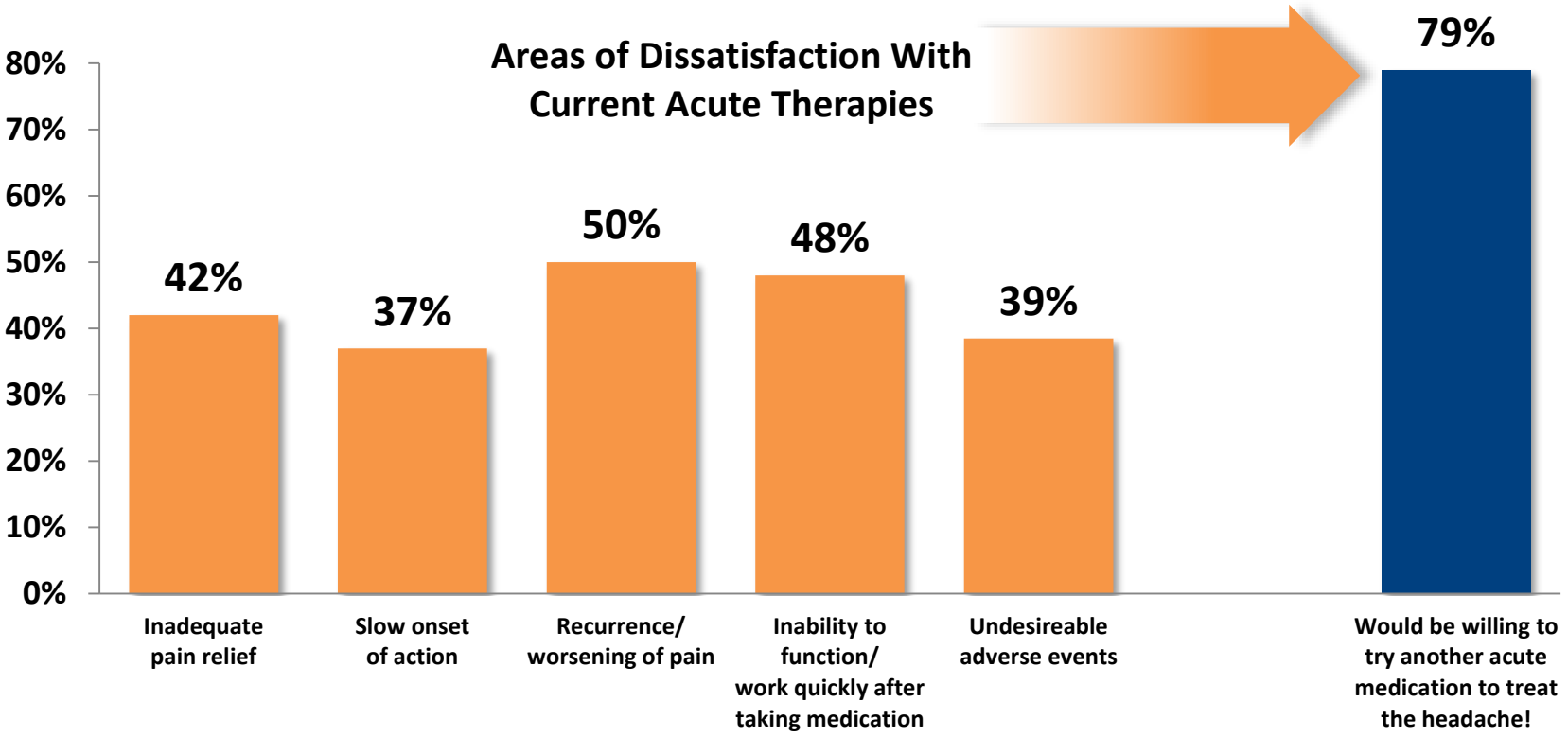


- Attributes of acute migraine treatments rated as important by migraineurs in the general population

ZOSANO PHARMA

Source: Lipton RB, Stewart WF. Headache. 1999;39(suppl 2):S20-S26

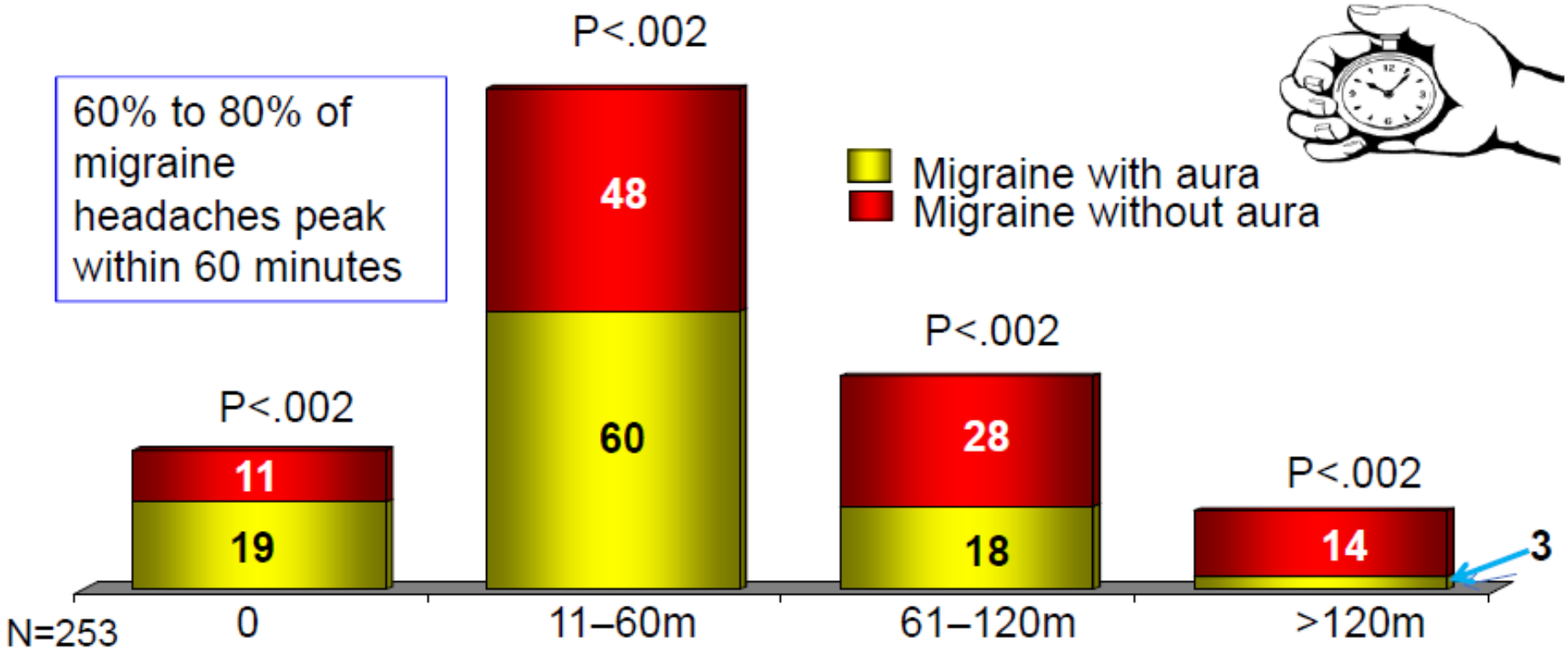
Many Patients are Dissatisfied and Willing to Try Something New



ZOSANO PHARMA

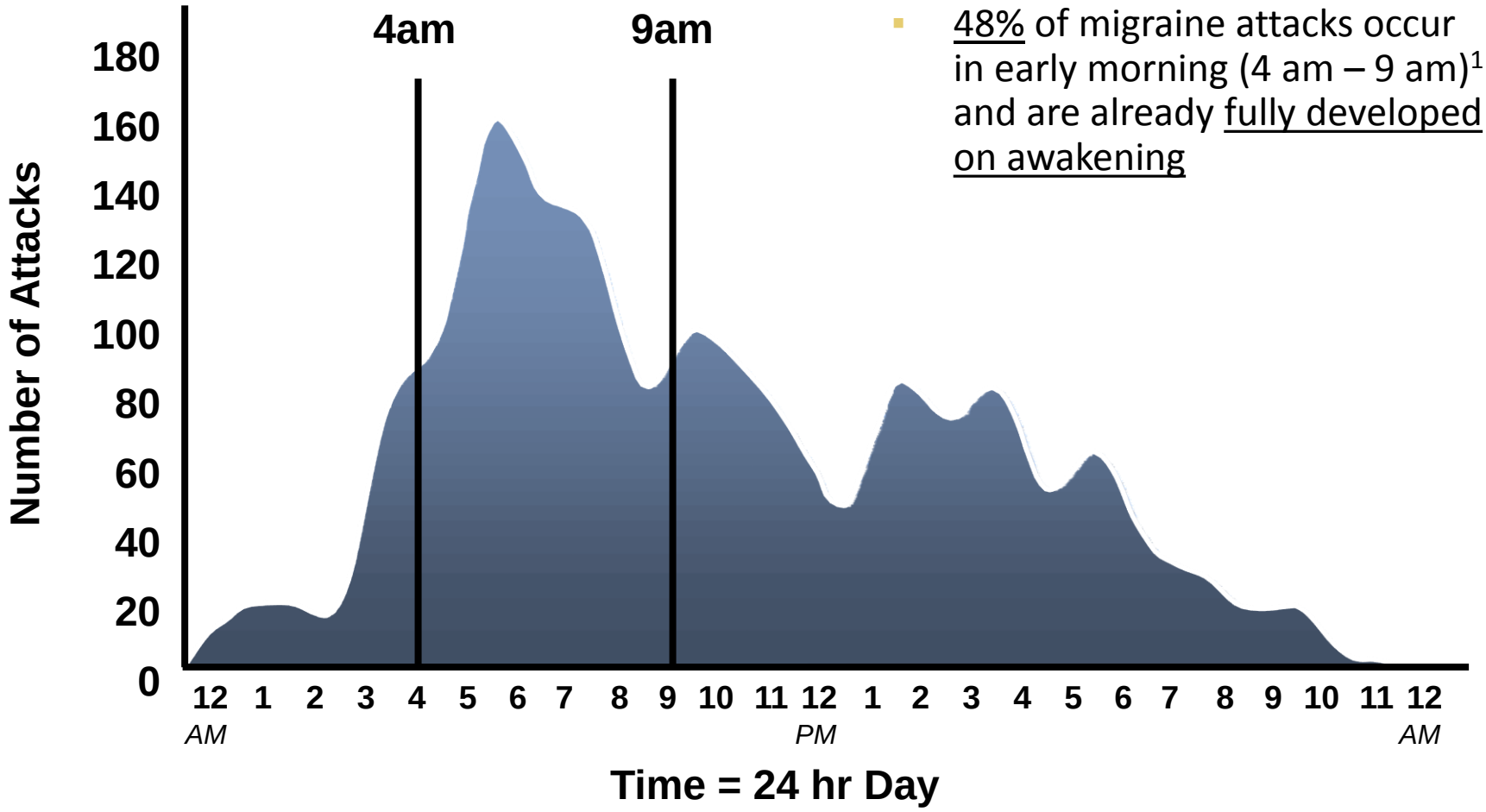
Source: Bigal ME et al. Headache. 2007;47:475-479.

Delayed Treatment Difficult to Treat
Time to Peak Intensity of Migraine Headache Pain



Source: Pryse-Phillips AW et al. Headache. 2006; 46(10): 1480-1486.

Most Common Reason for Delayed Treatment
Morning Migraine: Occur Often, Difficult to Treat



- 48% of migraine attacks occur in early morning (4 am – 9 am)[1] and are already fully developed on awakening

ZOSANO PHARMA

Source: Fox AW et al., Headache. 1998;38:436-441.

Limitations of Existing Therapies

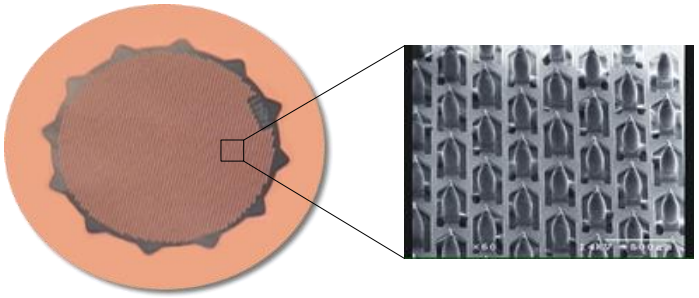
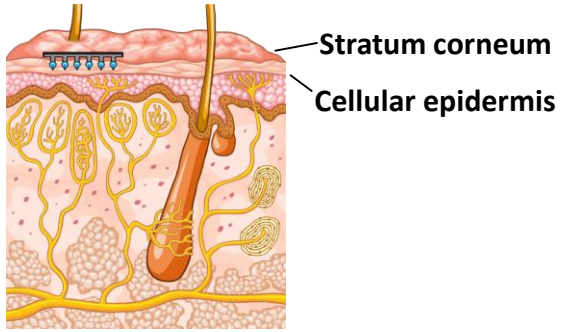
- Oral – slow acting
  - Gastroparesis delays absorption and onset of pain relief
  - Requires intake of foods/fluid (exacerbates nausea)
  - Prone to regurgitation and malabsorption
  - Difficult to take when patient has other comorbid GI symptoms
- Nasal – dose variability
  - Exacerbates nausea
  - Pain discomfort
  - Most of the drug is actually absorbed orally (80% via GI tract, 20% nasal), leading to reduced and slow absorption
  - Some patients do not like nasal route of administration (taste)
- Injectable – last resort
  - Pain discomfort
  - Cmax, Tmax dependent tolerability effect (pharmacokinetic/ pharmacodynamics)
  - Many patients (~50%) have needlephobia
  - Requires safe needle disposal services
  - Stigma associated with administering injections in public

M207 – Technologically Advanced Delivery of Zolmitriptan

- ADAM™ - Adhesive Dermally Applied Microarray
  - Rapid absorption
  - Self administered
  - Easy to use
  - Short wear time
  - Band aid like patch with titanium array
  - Reusable applicator
- Zolmitriptan
  - Crosses blood brain barrier
  - Most potent triptan
    - Ki = 2.51nM / 5-HT_{1D}
      6.31nM / 5-HT_{1B}
- Reduce drug related side effects
- Improve clinical outcomes

ZOSANO PHARMA

ADAM - Adhesive Dermally-Applied Microarray

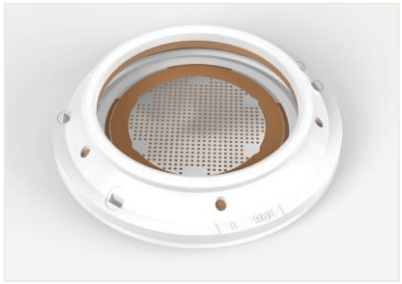
• **ADAM with coated titanium microarray (~300 microns in length)**	
• **Intracutaneous pharmaceutical delivery**	

- Originally developed by ALZA Corp / JNJ
  - Invested ~$200M in development
- Microarray patents through 2027
- Method of use patent through 2037

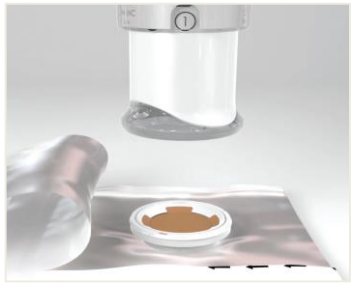
ZOSANO PHARMA

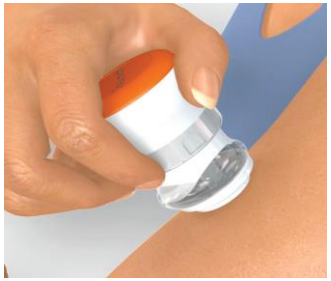
Patch Application

Coated ADAM Microarray



Applicator





ZOSANO PHARMA

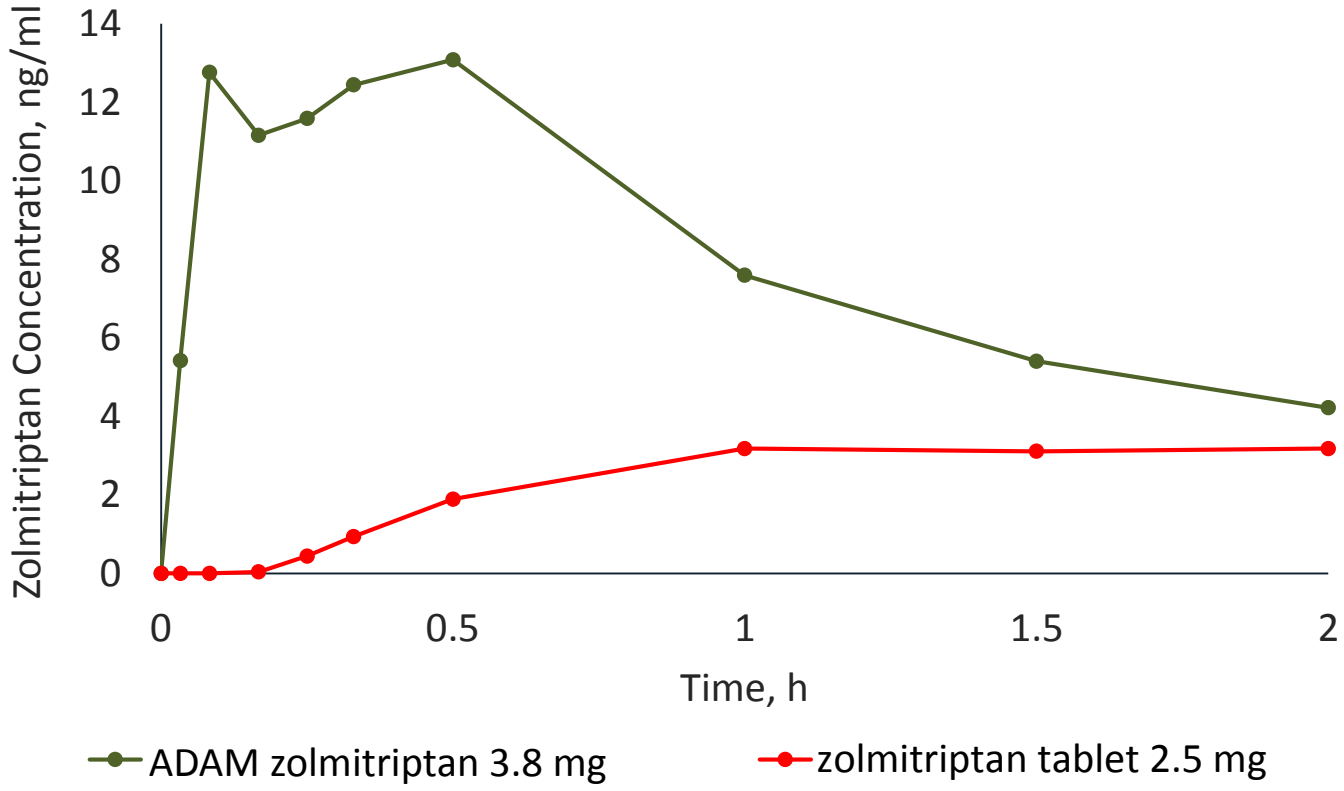
M207 Development

- Completed Phase I PK study in 2016
- Completed pivotal efficacy Phase 2/3 study in February 2017
  - 3.8mg dose achieved both co-primary endpoints
    - Pain freedom at 2 hours
    - Freedom from most bothersome symptom at 2 hours
- Started Long Term Safety Study – remaining clinical study for registration
  - Open label: 150 patients for 6 months and 50 patients for 1 year
  - 30 sites
- 100 patients enrolled by end of Q1 – Achieved March 2018
- 250 patients enrolled by Q2 – Achieved May 2018
- 6 month safety data Q4
- 12 month safety data Q1:2019
- NDA filing by year end 2019

ZOSANO PHARMA

M207 – Enhanced Delivery – Phase 1

- Mean plasma zolmitriptan concentration following ADAM zolmitriptan 3.8mg or 2.5mg oral tablet[1]

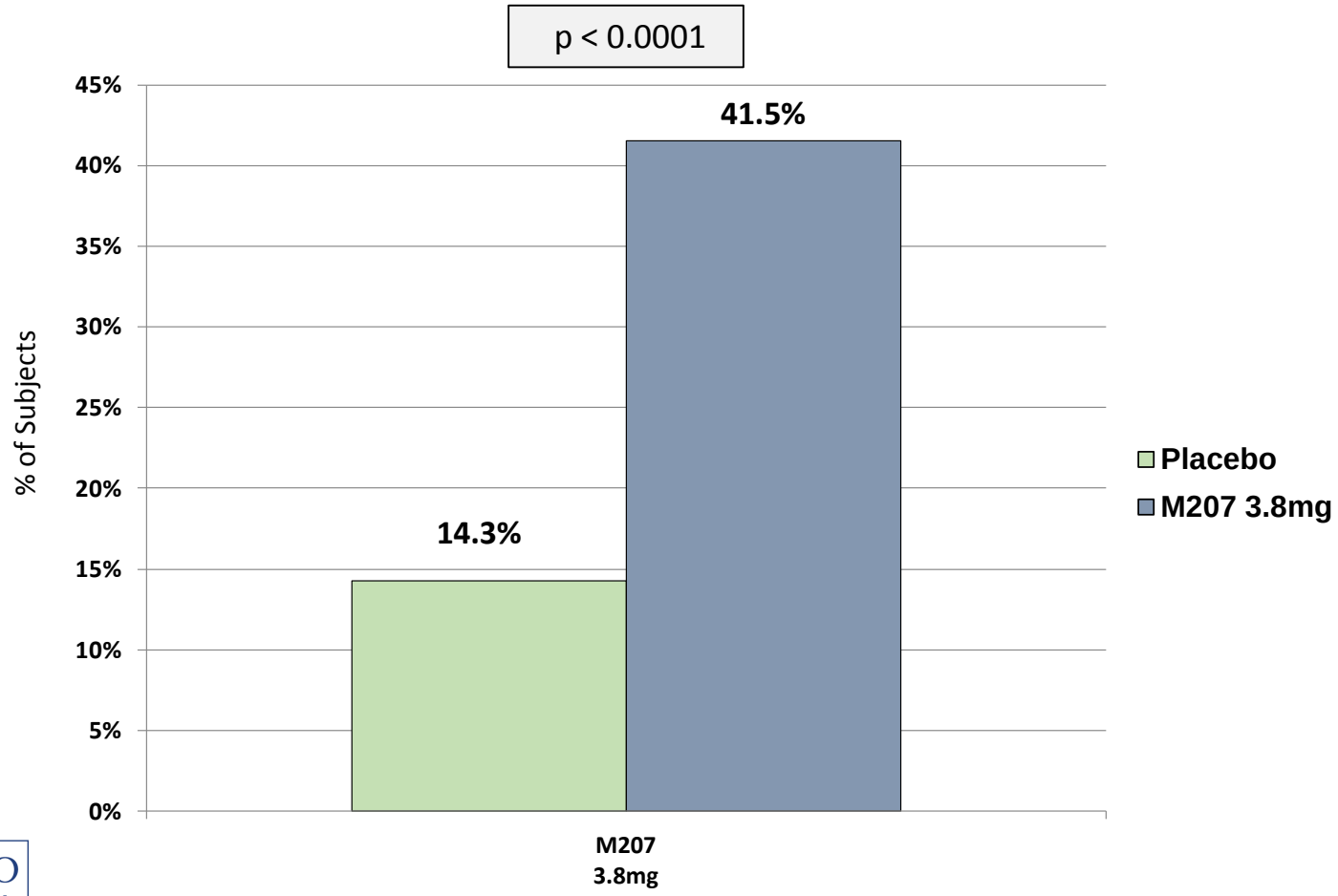


ZOSANO PHARMA

Source Kellerman DJ, Ameri M, Tepper SJ. Rapid systemic delivery of zolmitriptan using an adhesive dermally applied microarray. *Pain Management* doi: 10.2217/pmt-2017-0036 (2017).

Met Co-primary Endpoint – Pain Freedom

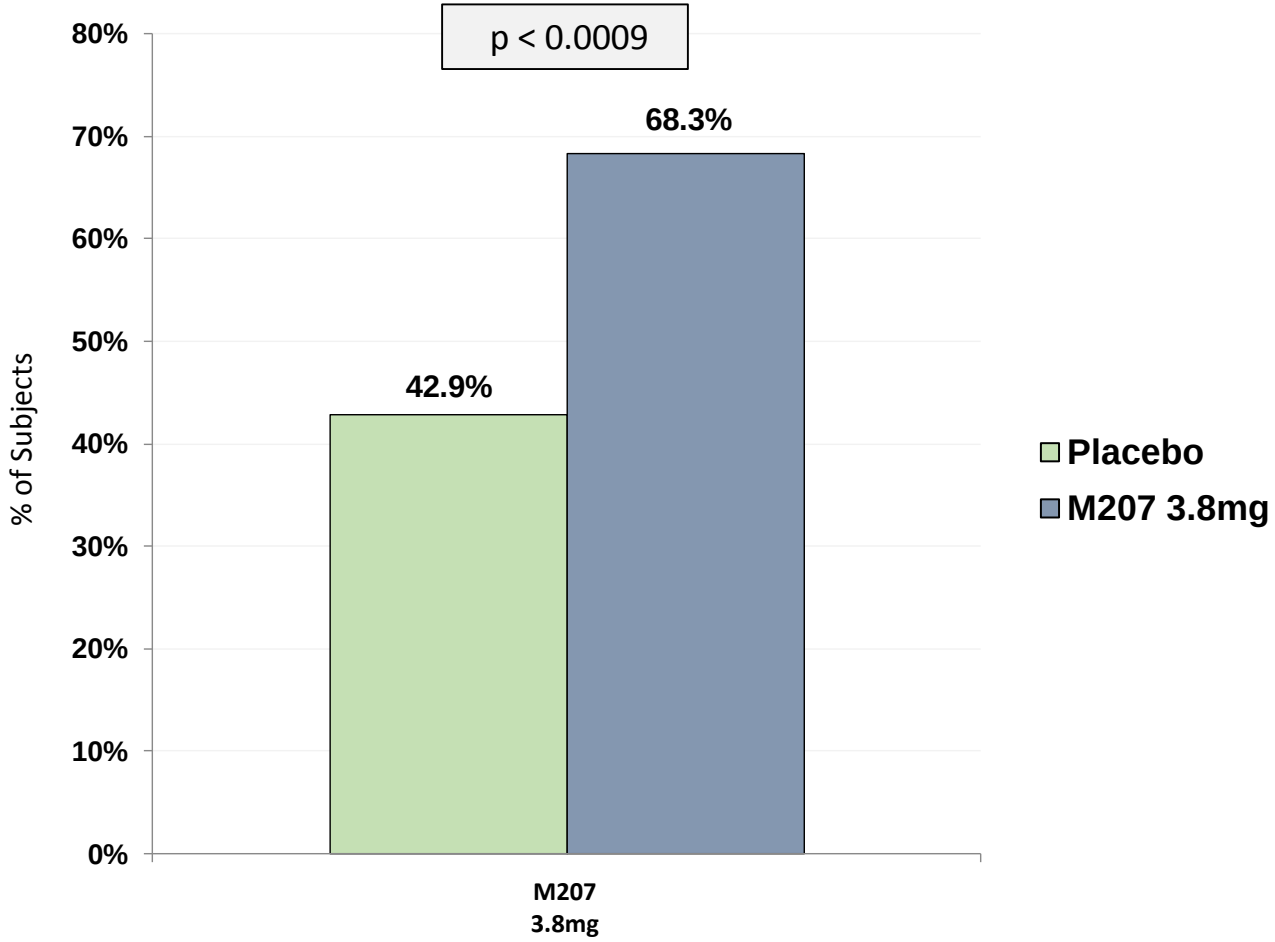
- 3.8 mg dose group met co-primary endpoint of pain freedom at 2 hours with a $p < 0.0001$



ZOSANO PHARMA

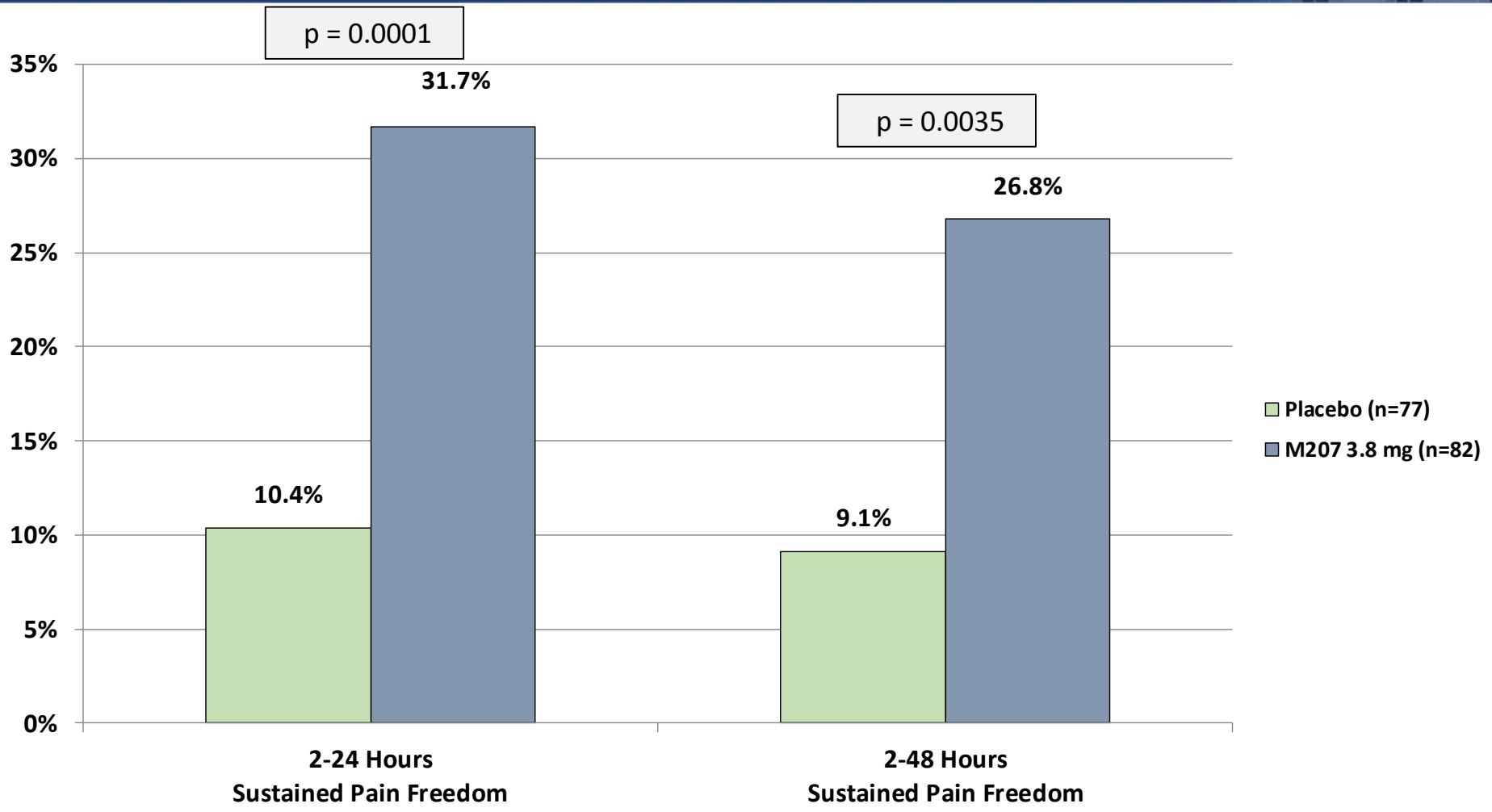
Met Co-primary Endpoint – Freedom From Most Bothersome Symptom

- 3.8 mg dose group met co-primary endpoint of freedom from most bothersome symptom at 2 hours with a $p < 0.0009$



ZOSANO PHARMA

Sustained Pain Freedom – 24 and 48 Hours

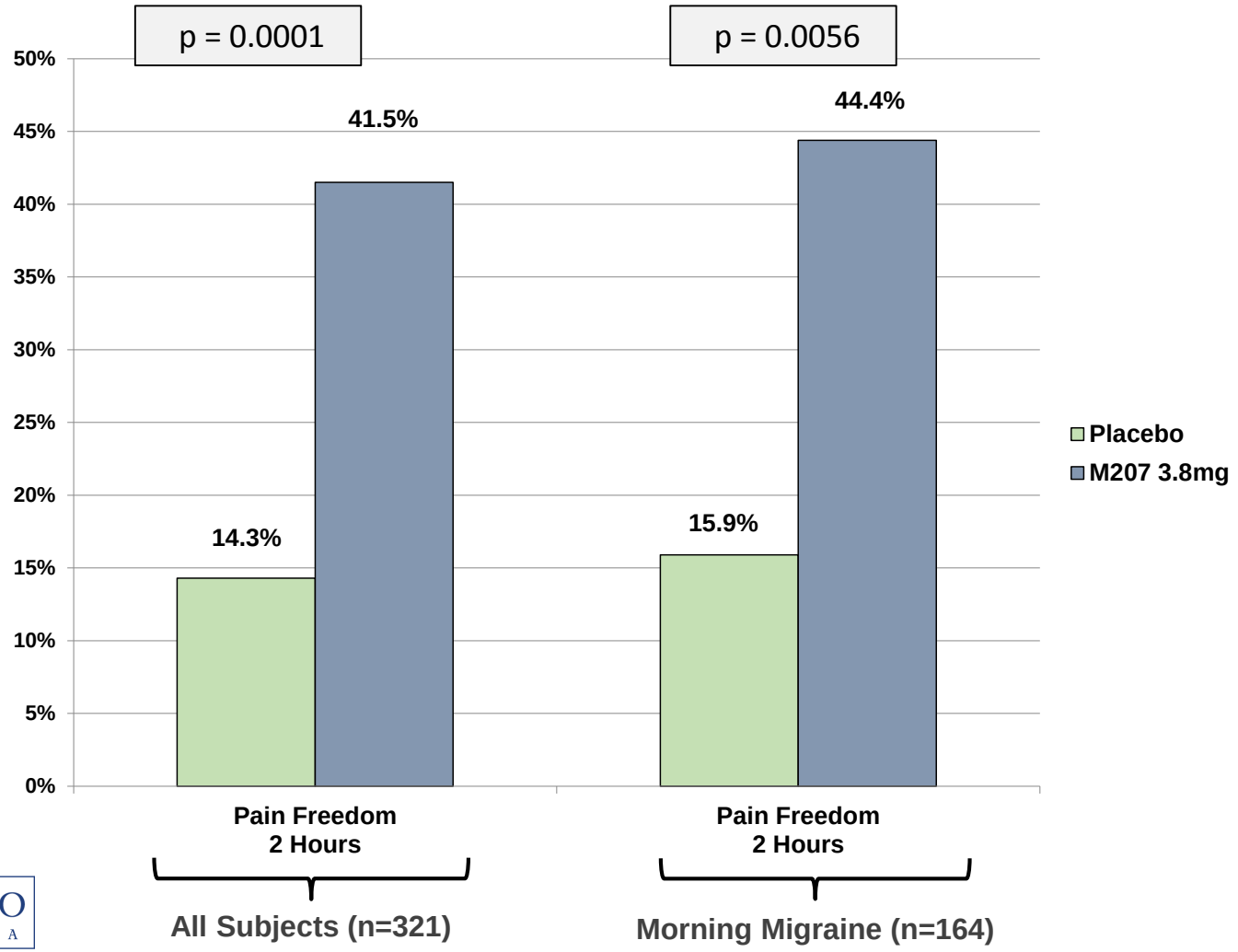


- 76% of patients who were pain free at 2 hours realized sustained pain freedom through 24 hours
- 65% realized sustained pain freedom though 48 hours

ZOSANO PHARMA

Strong Performance in Delayed Treatment Paradigm

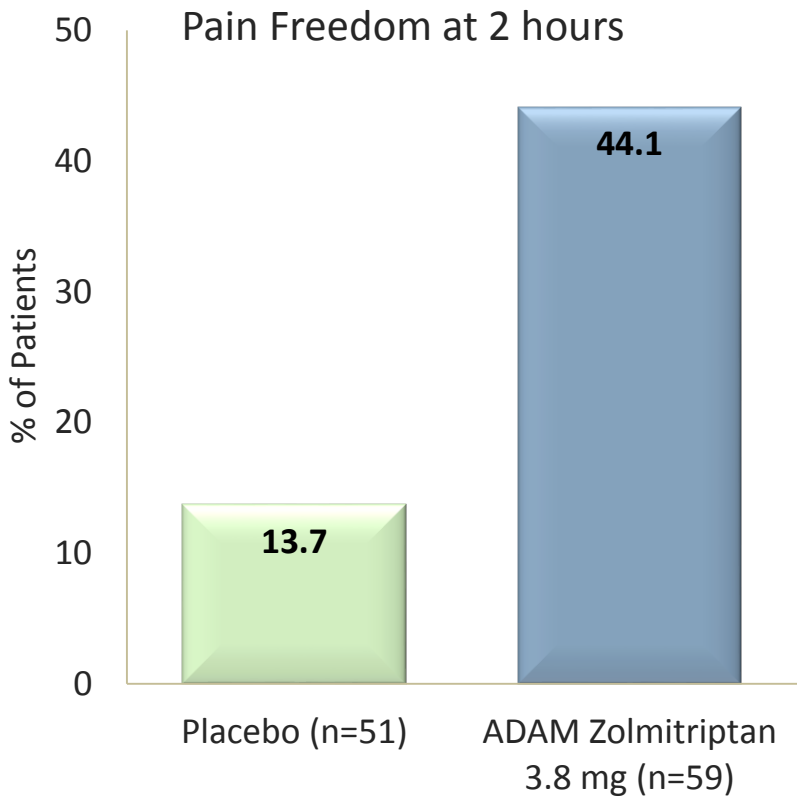
- Delayed treatment exemplified by morning migraine



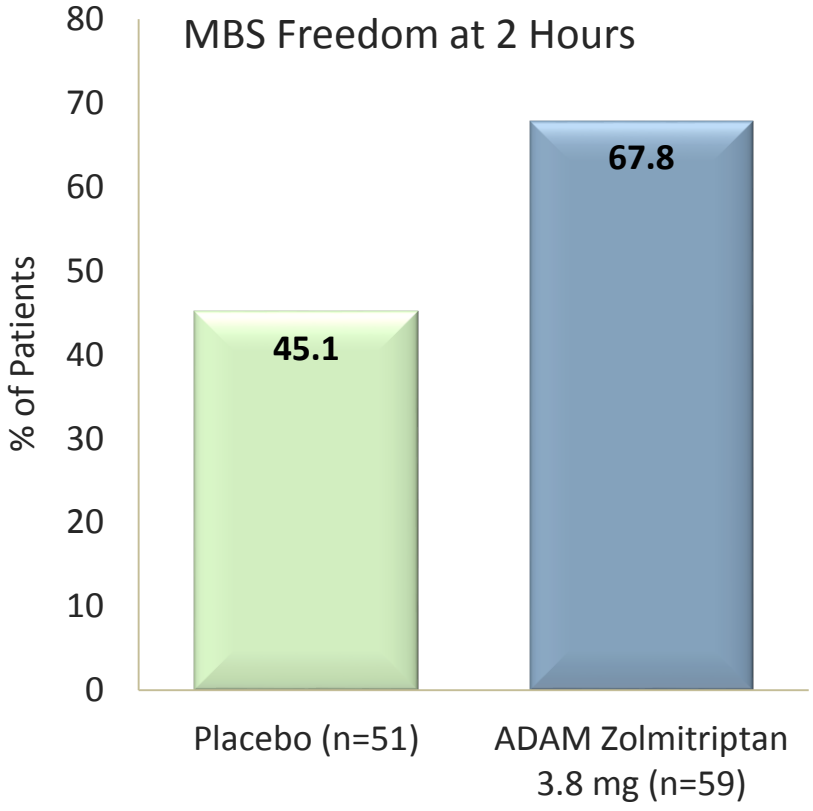
ZOSANO PHARMA

Pain Freedom and MBS Freedom in Patients with Nausea*

p = 0.0005



p = 0.009



ZOSANO PHARMA

*mITT patients, independent of prespecified Most Bothersome Symptoms

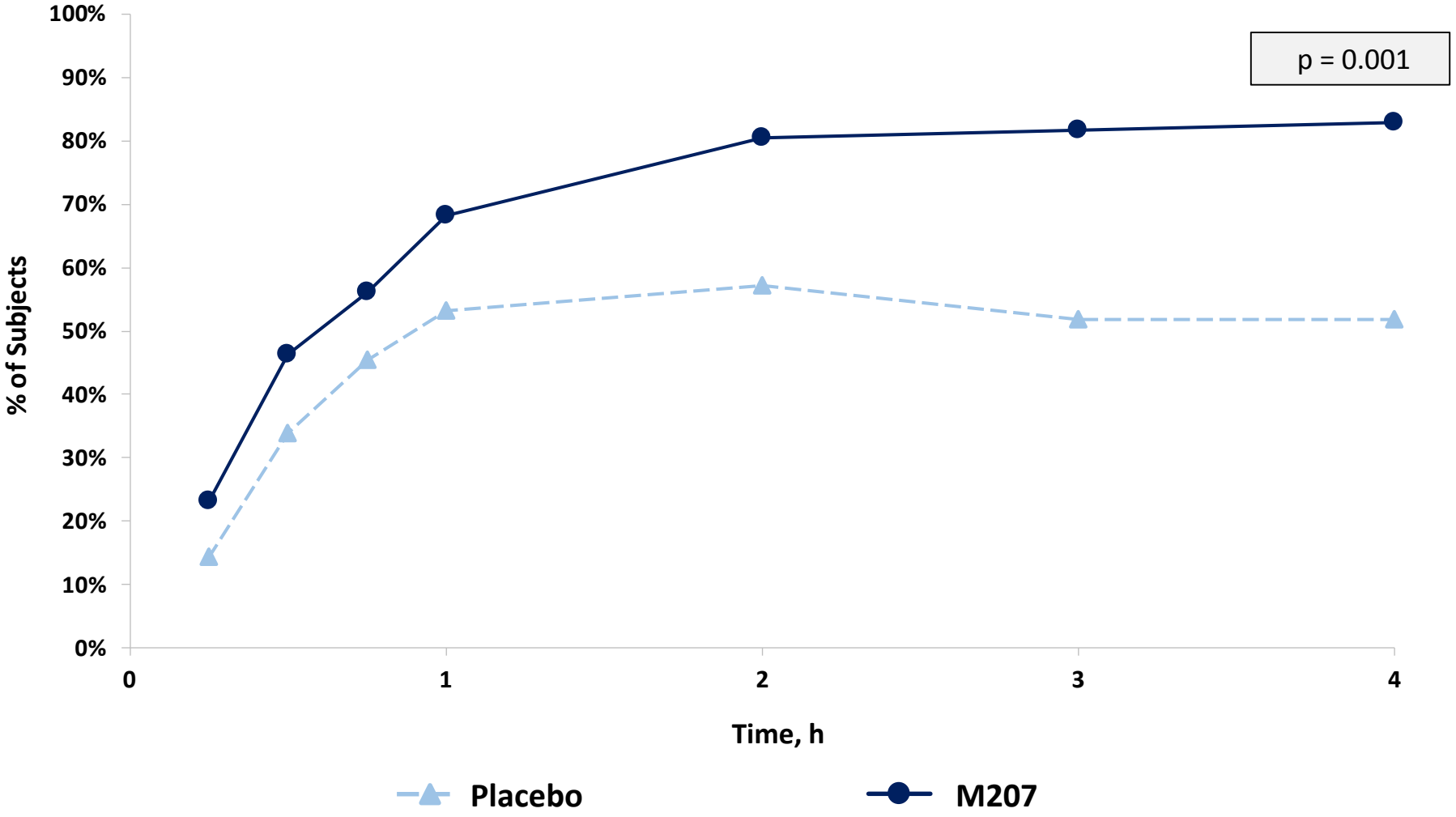
Treatment Emergent Adverse Events

Most frequent adverse events (≥4% for any treatment group)

	Placebo	M207 1 mg	M207 1.9 mg	M207 3.8 mg
Pharmacological:				
Dizziness	0.0%	1.3%	0.0%	4.8%
Mode of delivery:				
Erythema	10.8%	16.3%	19.5%	26.5%
Bruising	3.6%	6.3%	13.8%	14.5%
Pain	1.2%	2.5%	2.3%	9.6%
Bleeding	0.0%	3.8%	5.7%	4.8%

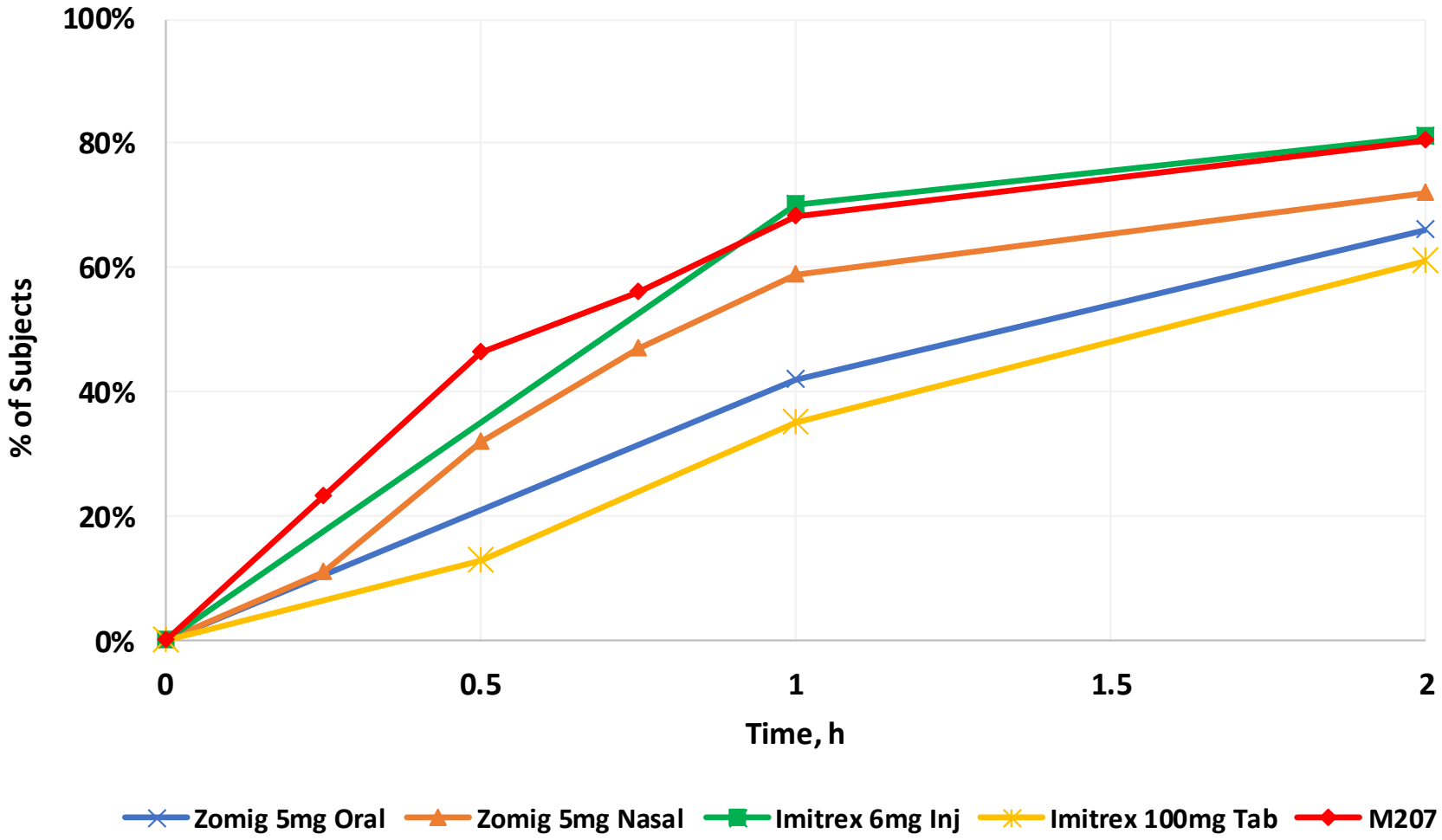
ZOSANO PHARMA

M207 Pain Relief Over Time



ZOSANO PHARMA

Pain Relief Over Time (Reference Compounds)

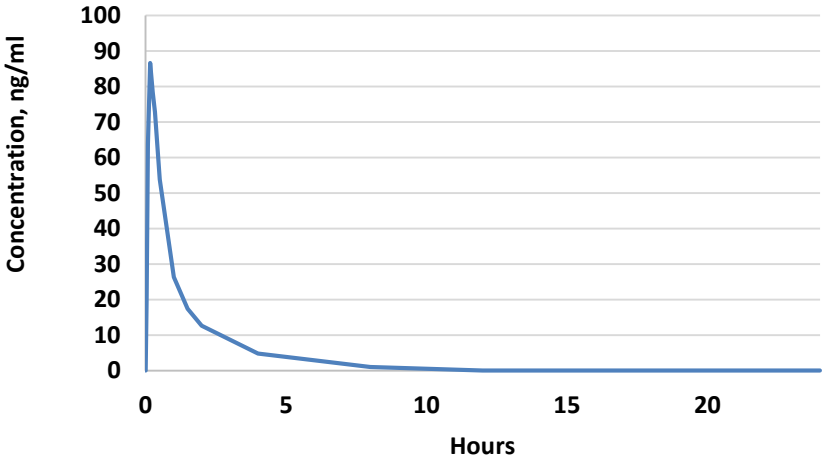


ZOSANO PHARMA

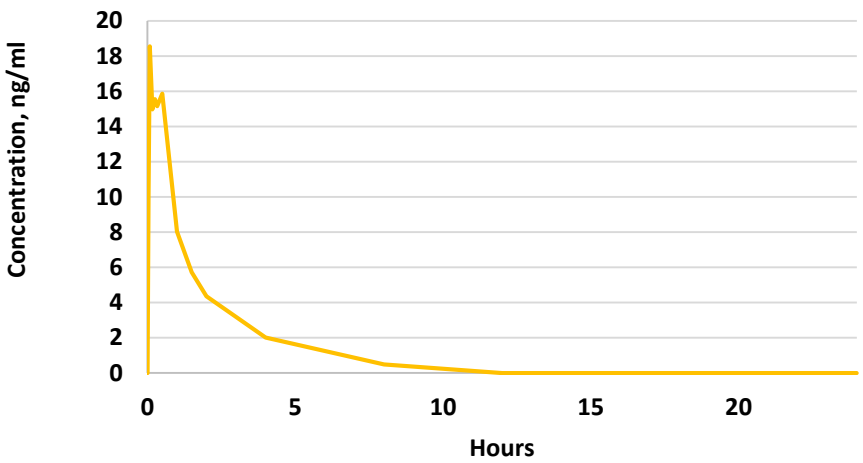
Source: data reported in product package inserts, not through a clinical trial, for information only

Higher T_{MAX} and C_{MAX} are Causal to Sumatriptan SC Drug Related Side Effects

Sumatriptan



M207 3.8mg



Note: Different scales presented

	Sumatriptan 6mg Injection	M207 3.8mg
Dizziness	12%	5%
Paresthesia	14%	2%
Drowsiness	3%	1%

ZOSANO PHARMA

Source: Sumatriptan package insert; ZSAN M207 Pivotal Efficacy Study

Long Term Safety Study Initiated Q4 2017

- **Design**
  - Open-label
  - 12 month study
  - 150 patients at 6 months
  - 50 (of the 150) patients at 12 months
- **Primary endpoint**
  - Adverse events and local tolerability from repeated administration
- **Secondary/other endpoints**
  - ECG and laboratory parameters
  - Pain-free response
- **Observational (eDiary entries)**
  - Pain relief
  - Frequency of migraines
  - Patient usage
- **Study Update**
  - On study drug: 300 subjects
  - Total migraines treated: 2,000+
  - Pain freedom at 2 hours: 42.8%
  - Pain relief at 2 hours: 83.9%
  - No reported SAEs

ZOSANO PHARMA

M207 Clinical Profile

- Addresses patients most frequently identified attributes in an acute migraine therapy
  - Pain freedom / pain relief ✓
  - Durability of effect ✓
  - Rapid onset ✓
  - Relief of associated symptoms ✓
  - Route of administration / bypasses GI tract ✓
  - Reduced pharmacologic side effects ✓

Market Research - Preference Share Conversion
Neurologist and Primary Care Physicians

	Neurologists	PCP
Preference Share	26.5%	31.3%
Adjust for Physician and Rx Coverage	89.0%	7.5%
Adjust for Detail Frequency Effectiveness	80.0%	80.0%
Adjust for Managed Care Access	80.0%	80.0%
Adjust for Patient Fill Rate	80.0%	80.0%
Estimated Peak Market Share	12.1%	1.2%

- Neurologist account for 89% of Rxs covered
- PCP account for 7.5% of Rxs covered

ZOSANO PHARMA

Source: Litchfield Analytics; (n=30), with PCPs (10), Neurologists (10), and Headache Specialists (10)

M207 Market Potential

Market potential for each 1% of prescriptions

	TRx Count (2019)	Nasal Pricing (AWP = $75/dose)	Injection Pricing (AWP = $180/dose)
M207 Market Potential	17,000,000	$76,500,000	$183,600,000

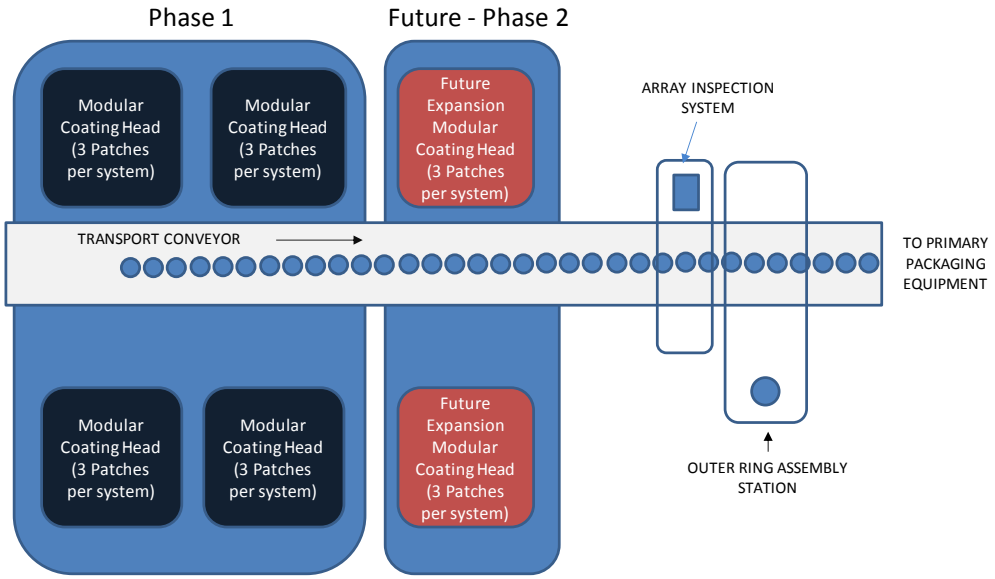
**2019 estimate for total triptan prescriptions*

ZOSANO PHARMA

Source: Symphony Health, Micromedex, assumes 6 doses per TRx

MANUFACTURING

- Currently manufacturing registration batches
- Automation of existing processes
  - Applicator
  - Patch assembly
  - Coating
- Major equipment component on order
- Potential to use CMO



ZOSANO PHARMA

2017 Accomplishments

Pivotal efficacy data
• 3.8mg dose met both co-primary endpoints
  • Pain freedom
  • Freedom from most bothersome symptom
	February

Completed follow-on	March
Successful EOP2 FDA meeting	May
Presented clinical efficacy data at American Headache Society (AHS)	June
Published Phase I PK data in *Pain Management*	August
Presented efficacy data and abstracts at IHC	September
Held investigator meeting for Long Term Safety Study (LTSS) with 30 sites	September
Completion of registration batches for applicator	November
Published pivotal efficacy data in *Cephalalgia*	November
First patient dosed in LTSS	November
Received patent allowance extending M207 patent life to 2037	December

2018 Milestones

Complete financing to fully fund through NDA filing	Q1 ✓
Enroll 100th patient in LTSS	Q1 ✓
Enroll 250th patient in LTSS	Q2 ✓
Quarterly investor updates • Average treatments/ month per patient • Percentage pain relief • Percentage pain freedom at two hours and 48 hours	Ongoing
Publish additional clinical data regarding most bothersome symptom endpoint/present at AHS	Q2 ✓
Complete registration batches of M207	Q3
Complete six month safety portion of LTSS	Q4
Completion of LTSS – 12 month data	Q1:2019
Initiate a partnered development program based on ADAM platform	Q4

ZOSANO PHARMA

Experienced Management

Name	Title	Experience
John Walker	Chief Executive Officer	Arris Pharmaceutical; Union Carbide; American Hospital Supply Corporation
Hayley Lewis	SVP, Operations	Depomed; Nektar; GlaxoSmithKline
Donald Kellerman, PharmD	VP, Clinical Development & Medical Affairs	MAP Pharmaceuticals, Inc.; Inspire; GlaxoSmithKline

ZOSANO PHARMA

- Large addressable market – Migraine
  - $5.4 billion in treatment costs in U.S.
  - High degree of patient dissatisfaction
- Proprietary delivery platform – ADAM™
  - ALZA / JNJ
  - Intracutaneous delivery to microvasculature
- Late stage development – M207
  - Phase I – completed and published
  - Phase II / III pivotal efficacy – completed and published
  - Phase III – LTSS ongoing – fully enrolled
  - NDA filing Q4:2019
- Improved clinical outcomes
  - Pain freedom
  - Pain relief
- Manufacturing scale up underway
- IP through 2037
- Experienced management team

ZOSANO PHARMA

ZOSANO

PHARMA