

**UNITED STATES  
SECURITIES AND EXCHANGE COMMISSION**  
Washington, D.C. 20549

**FORM 8-K**

**CURRENT REPORT**  
**Pursuant to Section 13 or 15(d)**  
**of the Securities Exchange Act of 1934**  
Date of Report (Date of earliest event reported): **April 20, 2022**

**TREVENA, INC.**

(Exact name of registrant as specified in its charter)

**Delaware**

(State or other jurisdiction of incorporation)

**001-36193**  
(Commission  
File No.)

**26-1469215**  
(IRS Employer  
Identification No.)

**955 Chesterbrook Boulevard, Suite 110**  
**Chesterbrook, PA 19087**  
(Address of principal executive offices and zip code)

Registrant's telephone number, including area code: **(610) 354-8840**

**Not applicable**

(Former name or former address, if changed since last report.)

Check the appropriate box below if the Form 8-K filing is intended to simultaneously satisfy the filing obligation of the registrant under any of the following provisions:

- Written communications pursuant to Rule 425 under the Securities Act (17 CFR 230.425)  
 Soliciting material pursuant to Rule 14a-12 under the Exchange Act (17 CFR 240.14a-12)  
 Pre-commencement communications pursuant to Rule 14d-2(b) under the Exchange Act (17 CFR 240.14d-2(b))  
 Pre-commencement communications pursuant to Rule 13e-4(c) under the Exchange Act (17 CFR 240.13e-4(c))

Securities registered pursuant to Section 12(b) of the Act:

<u>Title of each class</u>	<u>Trading Symbol(s)</u>	<u>Name of each exchange on which registered</u>
Common Stock, \$0.001 par value	TRVN	The Nasdaq Stock Market LLC

Indicate by check mark whether the registrant is an emerging growth company as defined in Rule 405 of the Securities Act of 1933 (§230.405 of this chapter) or Rule 12b-2 of the Securities Exchange Act of 1934 (§240.12b-2 of this chapter). Emerging growth company

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act.

**Item 7.01 Regulation FD Disclosure**

On April 20, 2022, Trevena, Inc. (the "Company") updated its website to include an updated corporate presentation deck. A copy of the updated corporate presentation deck is attached hereto as Exhibit 99.1.

The information set forth on this Item 7.01 and furnished hereto as Exhibit 99.1 shall not be deemed "filed" for purposes of Section 18 of the Exchange Act or incorporated by reference into any of the Company's filings under the Securities Act or the Exchange Act, whether made before or after the date of this Current Report, except as shall be expressly set forth by specific reference in such a filing.

**Item 9.01. Financial Statements and Exhibits.**

(d) Exhibits

<u>Number</u>	<u>Description</u>
<u>99.1</u> 104	<u>Updated Corporate Presentation Deck dated April 20, 2022</u> The cover page from this Current Report on Form 8-K, formatted in Inline XBRL

**SIGNATURES**

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned hereunto duly authorized.

**TREVENA, INC.**

Date: April 20, 2022

By: /s/ Barry Shin  
Barry Shin  
Senior Vice President & Chief Financial Officer

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Nasdaq: TRVN | April 2022

## Forward-Looking Statements

To the extent that statements contained in this presentation are not descriptions of historical facts regarding Trevena, Inc. (the "Company" or "we"), they are forward-looking statements reflecting management's current beliefs and expectations. Forward-looking statements are subject to known and unknown risks, uncertainties, and other factors that may cause our or our industry's actual results, levels of activity, performance, or achievements to be materially different from those anticipated by such statements. You can identify forward-looking statements by terminology such as "anticipate," "believe," "estimate," "expect," "intend," "may," "might," "plan," "objective," "predict," "project," "suggest," "target," "potential," "will," "would," "could," "should," "continue," "ongoing," or the negative of these terms or similar expressions. Forward-looking statements contained in this presentation include, but are not limited to, (i) statements regarding the timing of anticipated clinical trials for our product candidates; (ii) the timing of receipt of clinical data for our product candidates; (iii) our expectations regarding the potential safety, efficacy, or clinical utility of our product candidates; (iv) the size of patient populations targeted by our product candidates and market adoption of our potential drugs by physicians and patients; (v) the timing or likelihood of regulatory filings and approvals; and (vi) our cash needs.

Actual results may differ materially from those indicated by such forward-looking statements as a result of various important factors, including: the commercialization of any approved drug product, the status, timing, costs, results and interpretation of our clinical trials or any future trials of any of our investigational drug candidates; the uncertainties inherent in conducting clinical trials; expectations for regulatory interactions, submissions and approvals, including our assessment of the discussions with the FDA or other regulatory agencies about any and all of our programs; uncertainties related to the commercialization of OLINVYK; available funding; uncertainties related to our intellectual property; uncertainties related to the ongoing COVID-19 pandemic, other matters that could affect the availability or commercial potential of our therapeutic candidates; and other factors discussed in the Risk Factors set forth in our Annual Report on Form 10-K and Quarterly Reports on Form 10-Q filed with the Securities and Exchange Commission (SEC) and in other filings we make with the SEC from time to time. In addition, the forward-looking statements included in this presentation represent our views only as of the date hereof. We anticipate that subsequent events and developments may cause our views to change. However, while we may elect to update these forward-looking statements at some point in the future, we specifically disclaim any obligation to do so, except as may be required by law.

# Trevena's Experienced Leadership Team

## SENIOR MANAGEMENT

Carrie L. Bourdow	President & Chief Executive Officer	 
Mark A. Demitrack, M.D.	SVP, Chief Medical Officer	  
Patricia Drake	SVP, Chief Commercial Officer	 
Barry Shin	SVP, Chief Financial Officer	  
Robert T. Yoder	SVP, Chief Business Officer & Head of Commercial Operations	 

## BOARD OF DIRECTORS

Leon O. Moulder, Jr. Chairman	 	Marvin H. Johnson, Jr.	
Carrie L. Bourdow		Jake R. Nunn	
Scott Braunstein, M.D.	  	Anne M. Phillips, M.D.	 
Michael R. Dougherty	 	Barbara Yanni	



3

# Trevena: Innovative CNS Company

	<b>IV OLINVYK:</b> Differentiated profile	NCE approved for the management of acute pain in adults Launch in Q1 2021; additional supportive studies vs. IV morphine with near-term data
	<b>Large market, targeted launch</b>	45M+ US hospital patients; 9M procedures is initial core focus \$1.5B+ market opportunity for core focus
	<b>TRV027 for COVID-19</b>	Novel MOA with potential to treat COVID-19 acute lung injury / abnormal clotting Selected for NIH ACTIV trial; ~300 COVID-19 patients on TRV027
	<b>Novel CNS pipeline</b>	New mechanisms for diabetic neuropathic pain / epilepsy, acute migraine, opioid use disorder NCEs targeting significant unmet needs
	<b>Strong financial position</b>	\$66.9M cash and cash equivalents at year end 2021 Funds operations through Q4 2022

OLINVYK is indicated in adults for the management of acute pain severe enough to require an intravenous opioid analgesic and for whom alternative treatments are inadequate. Please see Important Safety Information including BOXED WARNING at the end of presentation. Full Prescribing Information at [www.OLINVYK.com](http://www.OLINVYK.com).  
NCE = New Chemical Entity; MOA = Mechanism of Action; NIH = National Institutes of Health; ACTIV = Accelerating COVID-19 Therapeutic Interventions and Vaccines; REMAP-CAP = Randomised, Embedded, Multi-factorial, Adaptive Platform Trial for Community-Acquired Pneumonia



4

## Multiple Expected Catalysts

	PRE-CLIN	PHASE 1	PHASE 2	PHASE 3	NDA	POST-APPR	EXPECTED CATALYSTS
<b>OLINVYK®</b> New chemical entity (mu-opioid receptor)	IV acute pain*				APPROVED		• Commercial launch ongoing
				Leiden UMC collab.	Respiratory physiology		• Study completed April 2022
				Cleveland Clinic / Wake Forest Baptist Health collab.	Cognitive function		• Topline data mid-22
					Clinical outcomes		• Topline data 2H 22
					Nhwa NDA Submission in China		• NDA Submitted
<b>TRV027</b> AT <sub>1</sub> receptor selective agonist	COVID-19 ARDS / abnormal clotting			NIH ACTIV collab.			• Topline data 2H 22
	COVID-19 PoC study			Imperial College London collab.			• Topline data announced
<b>TRV045</b> Selective S1P receptor modulator	DNP						• Phase 1 complete 2H 22
	Epilepsy			NIH collab.			
<b>TRV250</b> G-protein selective agonist (delta receptor)	Acute migraine						• IND-enabling activities (oral)
<b>TRV734</b> G-protein selective agonist (mu-opioid receptor)	Opioid use disorder			NIH / NIDA collab.			• POC study ongoing



OLINVYK is indicated in adults for the management of acute pain severe enough to require an intravenous opioid analgesic and for whom alternative treatments are inadequate.  
 \* Please see Important Safety Information including BOXED WARNING at the end of presentation. Full Prescribing Information at www.OLINVYK.com.  
 TRV250, TRV734, TRV027, and TRV045 are investigational products and are not approved by the FDA or any other regulatory agency.; ARDS = Acute Respiratory Distress Syndrome; ACTIV = Accelerating COVID-19 Therapeutic Interventions and Vaccines; NDA = New Drug Application, PoC = Proof-of-Concept, DNP = Diabetic Neuropathic Pain

5

## Ex-US Royalty-Based Financing Highlights

<b>Blue Chip Investor</b>	<b>R-Bridge Healthcare Fund</b> affiliate of CBC Group (one of the largest and most active healthcare-dedicated investment firms in Asia)
<b>\$40M Total Financing</b>	\$15M upfront \$10M on commercial or financing milestone \$15M on first commercial sale in China <b>\$40M total</b>
<b>Flexible Payments*</b>	<ul style="list-style-type: none"> <li>• <b>Chinese Royalties.</b> All royalties from Nhwa partnership, TRVN retains milestones</li> <li>• <b>Capped US Royalty.</b> 4% royalty on US OLINVYK net sales, with \$10M cap**</li> </ul>
<b>Constructive Terms</b>	<ul style="list-style-type: none"> <li>• No financial covenants</li> <li>• Negative pledge only until Chinese approval</li> <li>• Flexibility for additional business development opportunities</li> </ul>



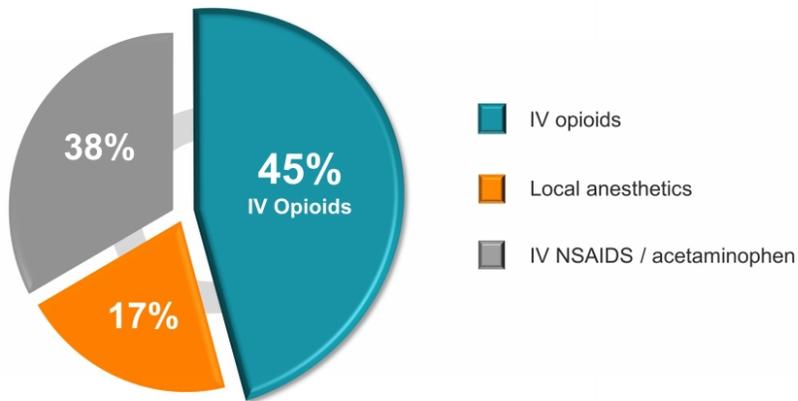
\* R-Bridge will receive a 1.5% fee and warrants for 5M shares at a strike price of \$0.82 / sh (75% premium to 30-day VWAP)

\*\*Potential increase to 7% (with combined US/China cap) if not approved by YE-23

6

# Large Market Opportunity – Acute Pain

US injectable analgesic hospital market unit volume<sup>1</sup>



45M patients receive IV opioids annually to treat acute pain<sup>1</sup>

IV opioids have unrivalled analgesic efficacy

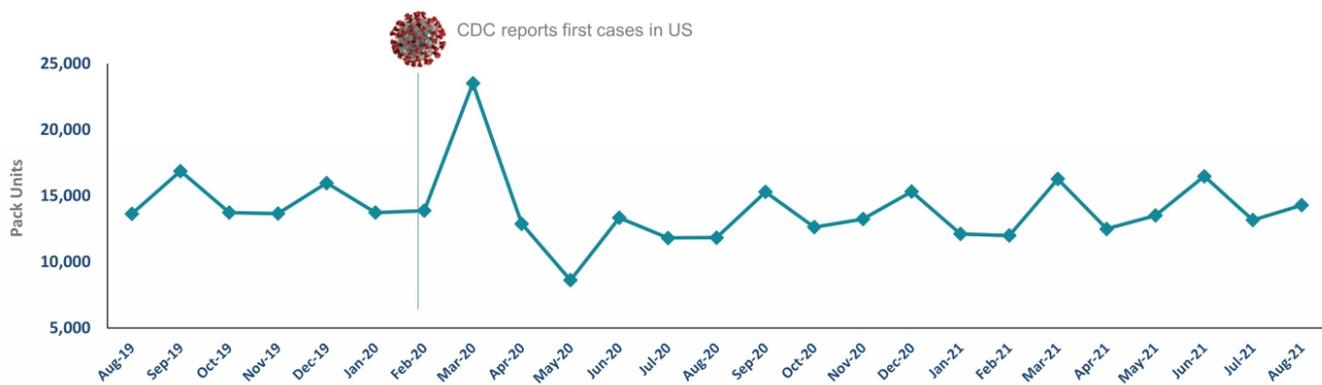
Top surgeries:  
Total knee arthroplasty, colectomy, hernia repair, spine fusion, C-section<sup>2</sup>



OLINVIK is indicated in adults for the management of acute pain severe enough to require an intravenous opioid analgesic and for whom alternative treatments are inadequate. Please see Important Safety Information including BOXED WARNING at the end of presentation. Full Prescribing Information at [www.OLINVIK.com](http://www.OLINVIK.com). Opioids are associated with serious, potentially life-threatening adverse reactions. NSAIDs = nonsteroidal anti-inflammatory drugs. 1) IMS MIDAS sales audit 2017; IV NSAIDs and Ofirmev®. 2) Definitive database, and National Vital Statistics report, CDC 2018.

## Stable IV Opioid Market Performance

Despite the 20% decline in elective surgeries, IV opioid volume remained stable



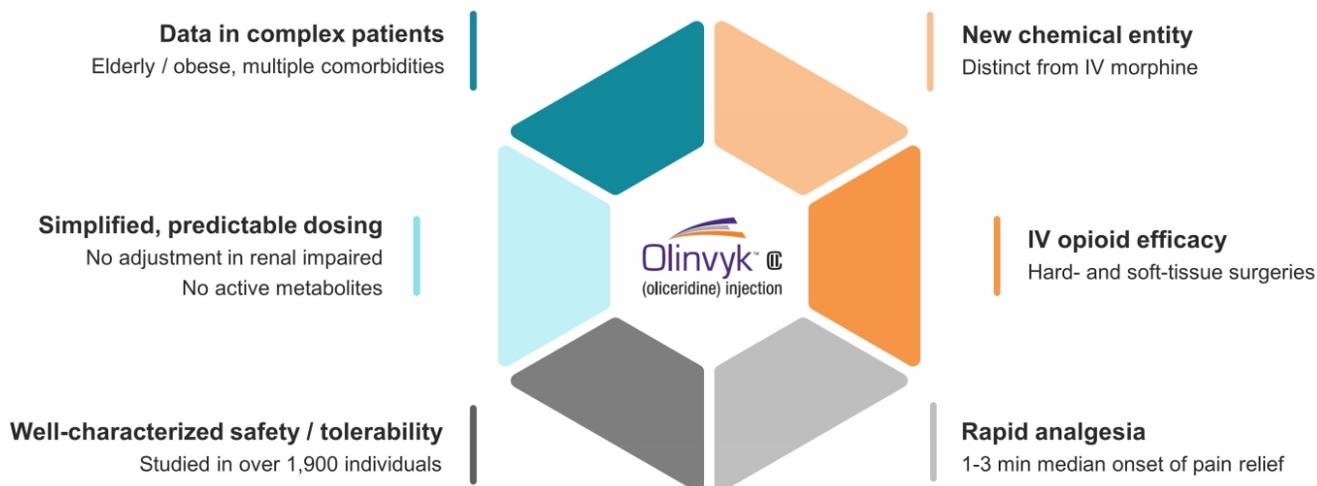
Declines due to COVID-19 across top surgical procedures:  
Total knee, Total hip, Hernia repair, Hysterectomy, Bariatric



SOURCE: IQVIA DDD Data August 2021

# OLINVYK: Differentiated Profile for Acute Pain

OLINVYK is indicated in adults for the management of acute pain severe enough to require an intravenous opioid analgesic and for whom alternative treatments are inadequate

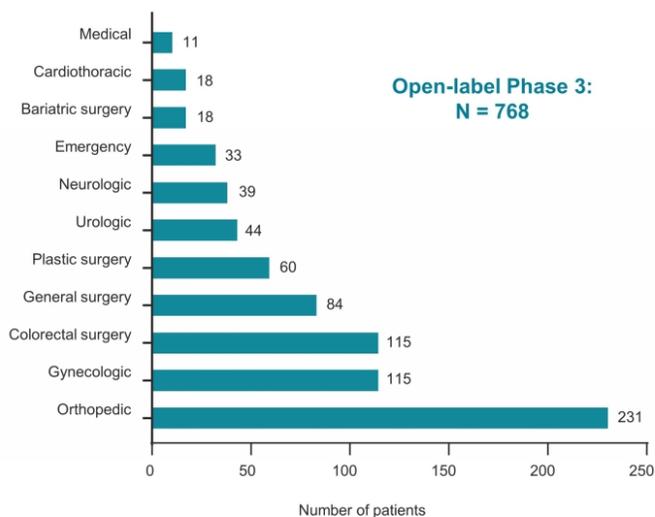


Please see Important Safety Information including BOXED WARNING at the end of presentation. Full Prescribing Information at [www.OLINVYK.com](http://www.OLINVYK.com).

9

## OLINVYK Studied in Complex Surgeries & Patients

Broad range of surgeries / medical procedures



### Complex patients included

- 32% ≥ 65 years; 46% BMI ≥ 30
- Co-morbidities: diabetes, obstructive sleep apnea, COPD, chronic / cancer pain
- Concomitant medications: antiemetics, antibiotics

### Multiple inpatient and hosp outpatient settings

- Hospital recovery
- Emergency department
- Critical care
- Ambulatory surgical centers

### Low discontinuation for AEs / lack of efficacy

- 2% for adverse events
- 4% for lack of efficacy



Please see Important Safety Information including BOXED WARNING at the end of presentation. Full Prescribing Information at [www.OLINVYK.com](http://www.OLINVYK.com).  
Bergese SD et al. J Pain Research, 2019. Trial modeled real-world use: usual patient care with OLINVYK instead of standard IV opioid.  
See FDA draft guidance for Industry Distributing Scientific and Medical Publications on Unapproved New Uses.

10

# OLINVYK: Well-Characterized Safety / Tolerability

Adverse drug reactions reported in ≥5% of OLINVYK-treated patients stratified by daily dose (Phase 3 pivotal trials pooled)<sup>1</sup>

	Placebo (N = 162)	OLINVYK ≤ 27 mg (N = 316)	Morphine (N = 158)
<b>Patients with any TEAE (%)</b>	73	86	96
Nausea	35	52	70
Vomiting	10	26	52
Headache	30	26	30
Dizziness	11	18	25
Constipation	9	14	14
Hypoxia	3	12	17
Pruritus	6	9	19
Sedation	5	7	13
Somnolence	4	6	10
Back pain	4	6	6
Hot flush	4	4	8
Pruritus gen.	1	2	10

Not an adequate basis for comparison of rates between the OLINVYK treatment group and the morphine treatment group.

## Key cost-drivers associated with IV opioids:

### Vomiting

Can result in significant health risks and compromise recovery

### Somnolence

Significant patient safety concern, can lead to respiratory depression

### O<sub>2</sub> saturation < 90%

Independent predictor of early post-op respiratory complications



Please see Important Safety Information including BOXED WARNING at the end of presentation. Full Prescribing Information at [www.OLINVYK.com](http://www.OLINVYK.com).  
<sup>1</sup>) OLINVYK Prescribing Information.

11

## Respiratory Physiology Study

Head-to-Head Comparison of OLINVYK and IV morphine in Elderly/Overweight Subjects (N=18)

### Assessment of Respiratory Function:

- Increase inhaled CO<sub>2</sub> to experimentally induce respiratory drive
- Impact of drug measured as change in minute ventilation
- Greater reductions in minute ventilation indicate more respiratory depression
- Validated method to estimate the impact of a drug on respiratory drive



Ventilatory Response to Hypercapnia

### Assessment of Pain Threshold:

- Analgesic comparison measured using valid models of induced cold and electrical pain



Analgesia Assessment

**As with all opioids, serious, life-threatening, or fatal respiratory depression may occur in patients treated with OLINVYK.**

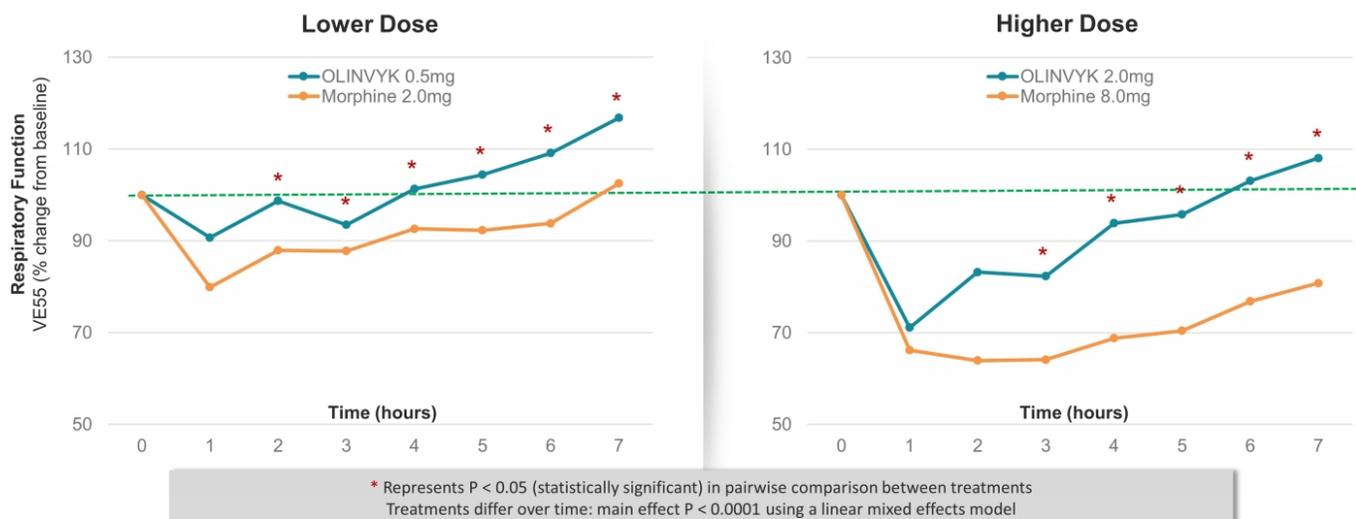


Please see Important Safety Information including BOXED WARNING at the end of presentation. Full Prescribing Information at [www.OLINVYK.com](http://www.OLINVYK.com).

12

# Respiratory Physiology Study: Elderly / Overweight Subjects

OLINVYK demonstrated reduced impact on respiratory function vs IV morphine



As with all opioids, serious, life-threatening, or fatal respiratory depression may occur in patients treated with OLINVYK.



Please see Important Safety Information including BOXED WARNING at the end of presentation. Full Prescribing Information at [www.OLINVYK.com](http://www.OLINVYK.com).

13

## Respiratory Physiology Study Observations

- Study population comprised elderly individuals (56 to 87 years, mean = 71.2) with BMI ranging from 20 to 34 (mean = 26.3)
- Both OLINVYK and IV morphine achieved comparable levels of pain relief. A statistically significant reduced impact on respiratory function was observed in patients treated with OLINVYK as measured by the mean respiratory ventilation profiles over time (P<0.0001)
  - *Lower Dose.* Very little impact on respiratory function was observed with OLINVYK (0.5mg), in contrast to IV morphine (2.0mg)
  - *Higher Dose.* Less respiratory depression was observed over the 6 hour measurement period with OLINVYK (2.0mg). The peak level was lower for OLINVYK compared to morphine but the difference was not statistically significant (P<0.05). Respiratory function rapidly returned toward baseline from 3 hours onwards (P<0.05 for all time points in pairwise comparison), vs IV morphine (8.0mg)
- The study replicates the results from the earlier study in younger subjects using a similar methodology. The findings extend our knowledge to patients who are at higher risk for the development of respiratory depression with the use of opioids, namely the elderly and overweight patients.

As with all opioids, serious, life-threatening, or fatal respiratory depression may occur in patients treated with OLINVYK.



Please see Important Safety Information including BOXED WARNING at the end of presentation. Full Prescribing Information at [www.OLINVYK.com](http://www.OLINVYK.com).

14

# New OLINVYK vs IV Morphine Cognitive Function Study

Clinical assessment of OLINVYK's potential impact on cognitive function vs. IV morphine

- Phase 1 randomized, double-blind, placebo-controlled, crossover study
- N = ~24 subjects, 18-55 years old
- Topline data expected mid-2022

## Cognitive function assessment: NeuroCart



- Comprehensive CNS test battery, used in testing a wide range of CNS drugs for 30 years
- Cognitive outcome measures include major domains of motor performance, attention, reaction time, memory, and executive function

*Study will also include pain model testing (cold pressor test) and PK assessment*

# OLINVYK Safety Outcomes Study w/ Cleveland Clinic

Further characterizes potential respiratory, GI and cognitive outcomes

- Open-label, multi-site study led by experts at Cleveland Clinic and Wake Forest Baptist Health
- N = ~200 adults undergoing major non-cardiac surgery
- Topline data expected in 2H 2022

## Respiratory Safety



**Predefined capnography and oximetry measures**

Assessment via continuous respiratory monitoring

## GI Tolerability



**Complete GI response endpoint**

No vomiting and no antiemetic use through study period

## Cognitive Function



**Somnolence, delirium, and sedation**

Validated, standardized assessment scales

As with all opioids, serious, life-threatening, or fatal respiratory depression may occur in patients treated with OLINVYK.

# OLINVYK: Ease of Dosing and Administration

3 vials allow for flexible and tailored IV dosing

- **Bolus Dosing:** 1 mg and 2 mg vials (single dose)
- **PCA Dosing:** 30 mg vial (single patient use)
- **OLINVYK 1 mg ≈ morphine 5 mg<sup>1</sup>**

27 mg cumulative daily dose limit

Do not administer single doses greater than 3 mg

No refrigeration / reconstitution



1 mg / 1mL



2 mg / 2mL



30 mg / 30 mL

WAC:

\$17.50

\$25.75

\$110.00

~\$100 / day

(estimated avg cost across procedures)



Please see Important Safety Information including BOXED WARNING at the end of presentation. Full Prescribing Information at [www.OLINVYK.com](http://www.OLINVYK.com).

1) For an initial dose. PCA = Patient-Controlled Analgesia

17

## OLINVYK vs IV Morphine Health Economic Models

Published<sup>1</sup> and available to formulary committees

Representative Inputs:

AE rates\*

Ph3 trials

AE	OLINVYK	Morphine
Vomiting	10	15
Somnolence / sedation	10	15
O <sub>2</sub> saturation <90%	10	15
Nausea	10	15
Respiratory depression	10	15
Pruritus	10	15
Other	10	15

Vomiting  
Somnolence / sedation  
O<sub>2</sub> saturation <90%

Cost of AEs

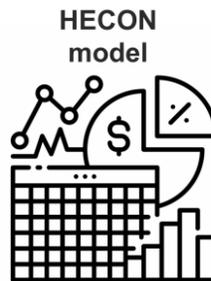
Gov't sources / Publications

\$8k nausea / vomiting<sup>2</sup>  
\$28k critical resp event<sup>3</sup>  
+7 days hospital stay<sup>3</sup>

Drug cost



OLINVYK  
IV morphine



Key Outputs:

>10x

Cost savings for hospitals<sup>4</sup>

Due to improved patient outcomes

\* As stated in the table, these data are not an adequate basis for comparison of rates between OLINVYK treatment group and the morphine treatment group. The OLINVYK and morphine dosing regimens studied are not considered equipotent.

1) Simpson KN, et al., J Comp Eff Res, 2021;10:1107-1119 and Simpson KN, et al. Expert Rev Pharmacoecon Outcomes Res; 2022

2) Oderda, GM, J Pain Palliative Care Pharm, 2019; data based on 5 surgical procedure categories including Cardiothoracic / vascular, General / Colorectal, Ob / Gyn, Orthopedic, and Urologic. 3) Overdyk FJ, PLoS One, 2016. More conservative inputs were used in the model. 4) Calculated based on total costs of Tx and average total costs of care. Image: flaticon.com.



18

# Customer Engagement Strategy

## Targeted Account Launch

~40 FTEs across Medical, Market Access and Sales deployed in focused segments

### Health Care Practitioners (HCPs)

Anesthesiology, Colorectal, Burn physicians

- 1 OLINVYK: NCE, distinct from IV morphine
- 2 1-3 min onset & no active metabolites
- 3 Safety data in complex patients / surgeries

### Targeted Accounts

~70% of IV opioid volume covered by customer facing team

- 1 OLINVYK published safety data
- 2 Published health economic / cost offset data

# Expanded Targets: ~150 Burn Center Accounts

Critical care / burn patients experience severe pain and are at higher risk for AEs

## Targeted market opportunity

- ~40k burn-related hospitalizations each year across 150 burn centers in US
- Longer average in-patient stay: 8-9 days
- Burn guidelines recommend use of IV opioids

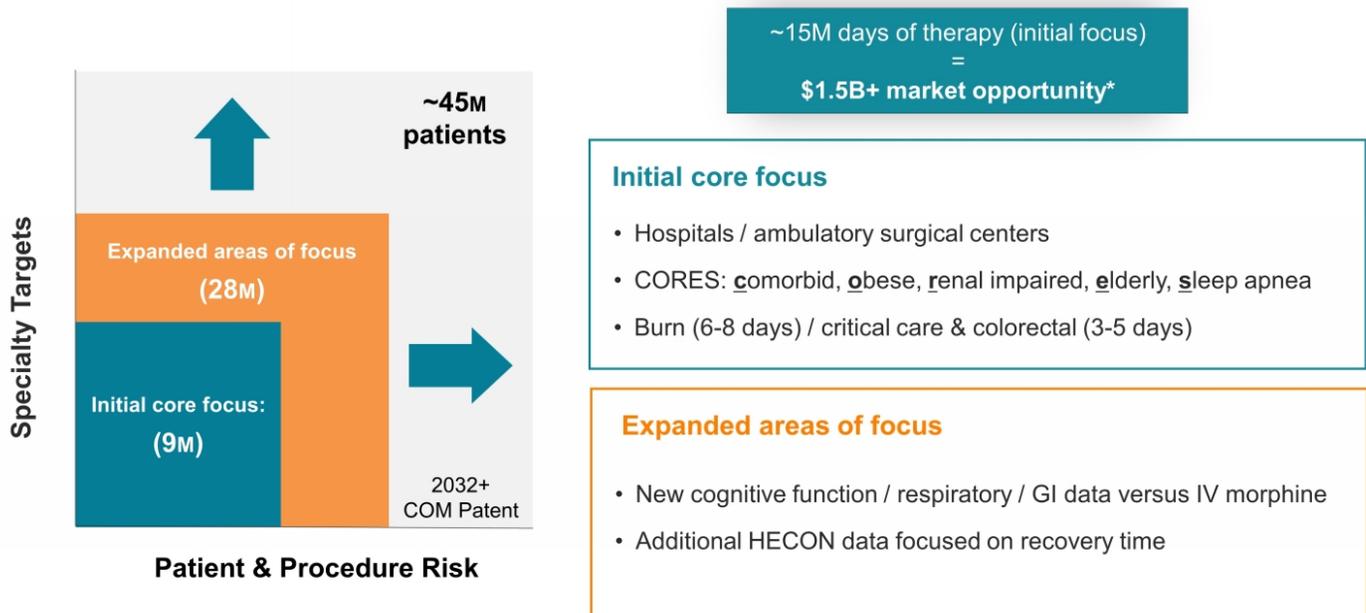
### Key considerations

### OLINVYK attributes

Need for rapid, long-lasting acute pain relief	1-3 minute onset of action ~3 hour duration
Many patients have renal injury	No dose adjustment for patients with renal impairment
Need to avoid dose-stacking	No active metabolites
AEs of concern: respiratory depression, vomiting, sedation	Well-characterized safety / tolerability profile



## OLINVYK: Significant Opportunity in Acute Pain



Please see Important Safety Information including BOXED WARNING at the end of presentation. Full Prescribing Information at [www.OLINVYK.com](http://www.OLINVYK.com).  
 Source: Definitive Healthcare, American Hospital Association. \*Assumes ~\$100 / day price for OLINVYK.  
 2032 composition of matter patent expiration does not include potential patent extensions.

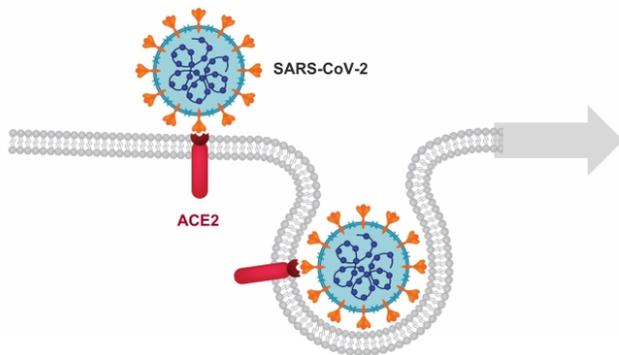
# TRV027

## NCE targeting the AT1 receptor in COVID-19

### Multi-Organ Damage From Coronavirus

Elimination of ACE2 protein leads to critical hormonal imbalances

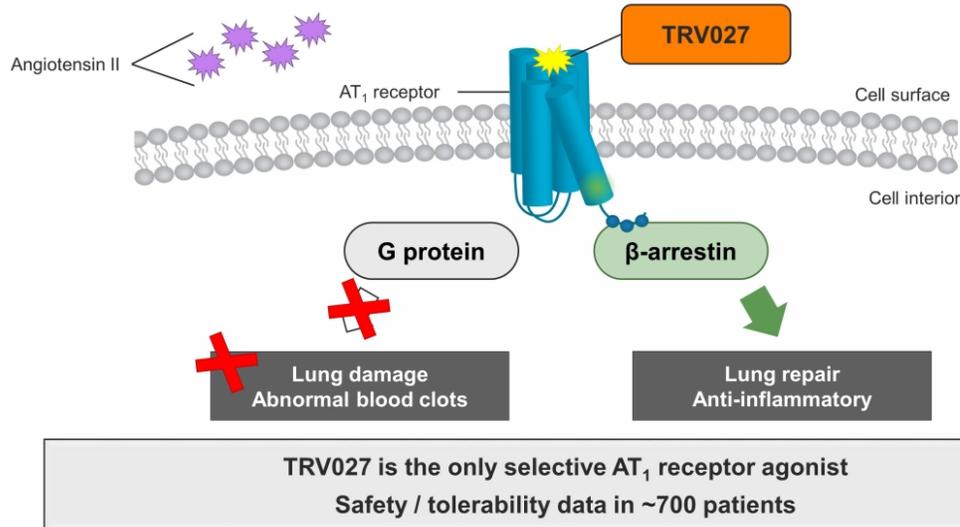
#### Coronavirus binds to and eliminates ACE2<sup>1</sup>



- Leads to accumulation of angiotensin II:
  - Acute lung injury and abnormal blood clots
  - Can lead to ARDS / pulmonary embolism / stroke
- 66% - 94% mortality rate for COVID-19 related ARDS<sup>2\*</sup>
- ~1/3 of hospitalized COVID-19 patients develop clotting complications<sup>3</sup>

# TRV027: New MOA for COVID-19

Mechanism targeted to improve lung function and prevent abnormal clotting



## TRV027 COVID-19 Study - Imperial College London

Topline Data announced 3Q '21

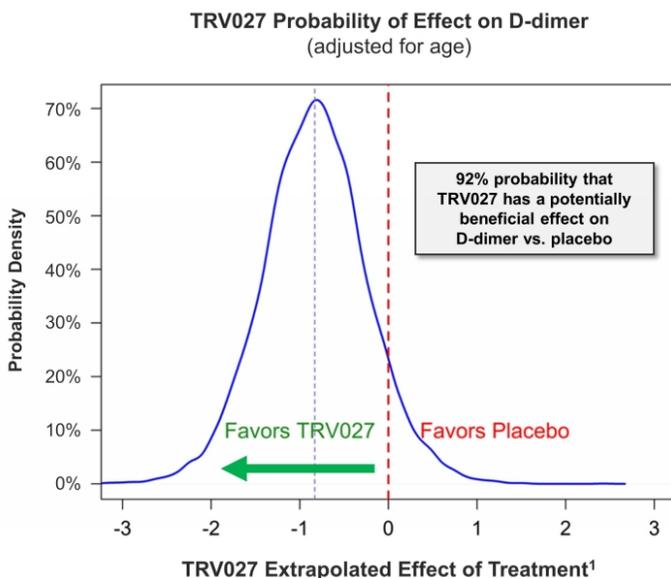
- Randomized, double-blind, placebo-controlled proof-of-concept study
- N = 30 COVID-19 patients enrolled
  - Hospitalized, non-ventilated
  - ≥18 years old
  - IV infusion of placebo or TRV027 for 7 days (12 mg/hr)
- Primary endpoint: mean change from baseline D-dimer levels at three days



Imperial College  
London

Preliminary data show that TRV027 provided initial evidence of improvement on biomarker and clinical endpoints associated with COVID-19 disease severity and progression

# Primary Endpoint (D-Dimer Reduction) – Bayesian Results



**D-dimer biomarker:**  
Recognized predictor of disease progression and mortality in COVID-19 infection



<sup>1</sup>) Percentage change from baseline D-dimer per year of age.

27

# Time to Initial Hospital Discharge (Length of Hospital Stay)

Full Analysis Set (excludes deaths)	TRV027 (N=7)*	Placebo (N=10)	Difference
Mean (days)	11.4	23.3	<b>11.9 days</b>
Median	8	12	<b>4 days</b>
Range	5, 32	5, 86	

NOTE: Post-hoc analysis of differences in LOS not dependent upon baseline D-dimer level or SOFA score



A post-hoc analysis indicated that patients receiving TRV027 experienced ~12-day reduction in average length of hospital stay compared to placebo (11.4 vs. 23.3 days), with a median reduction of 4 days (8 vs. 12).  
LOS = Length of Stay, SOFA = Sequential Organ Failure Assessment  
\*1 patient with missing discharge date but alive at Day 30 follow-up.

28

# Preliminary Conclusions

TRV027 was well-tolerated in hospitalized COVID-19 patients

## Primary endpoint:

- Bayesian modeling predicted 92% probability for TRV027 having a potentially beneficial impact on D-dimer levels
- TRV027 patients experienced 70% reduction in circulating D-dimer, vs. 27% of placebo patients through 3 days of infusion

## Post-hoc analysis:

- TRV027 patients experienced a 12-day reduction in average length of hospital stay compared to placebo<sup>1</sup>
- Reduction in time to hospital discharge not dependent on indices of disease severity prior to treatment

These preliminary data show that TRV027 provided initial evidence of improvement on biomarker and clinical endpoints associated with COVID-19 disease severity and progression



<sup>1</sup> A post-hoc analysis indicated that patients receiving TRV027 experienced ~12-day reduction in average length of hospital stay compared to placebo (11.4 vs. 23.3 days), with a median reduction of 4 days (8 vs. 12). 29

# Multi-Arm Platform Trial with TRV027 in COVID-19 Patients<sup>1</sup>

TRV027 data expected in ~300 patients; NIH ACTIV-4 topline data expected 2H 2022

## NIH ACTIV-4\* (US)



### Primary outcome:

**Supplemental O<sub>2</sub>-free days**  
(28 days post-randomization)

*Additional outcomes:* in-hospital mortality, ventilator-free days, clinical status

- NIH ACTIV-4 is fully funding this study; Trevena is supplying TRV027
- US: Majority of sites are currently open and enrolling patients
- New International Expansion: Enrollment expanded to international sites in the coming months



\*ACTIV = Accelerating COVID-19 Therapeutic Interventions and Vaccines.

<sup>1</sup>.Patients with ARDS/Abnormal clotting associated with COVID-19

# TRV045: Novel MOA for Diabetic Neuropathic Pain

Selective S1PR with no lymphopenia – Expected Completion of Phase 1 2H 2022

**S1P<sub>1</sub> receptors are expressed broadly in the CNS**

**Potential role in the treatment of:**

**Neuropathic pain**

- Inhibits pain sensation<sup>1</sup>
- Inhibits excitatory neuronal signaling<sup>2</sup>

**Epilepsy**

- Neuroprotective effects<sup>3</sup>
- Modulates permeability of BBB, anti-inflammatory effects<sup>4</sup>

Selective for S1P-subtype 1 receptor:  
Potential to avoid known safety issues associated with S1P receptor subtypes 2, 3, 4, 5:

Potential pulmonary, cardiac, and cancer-related effects<sup>5</sup>



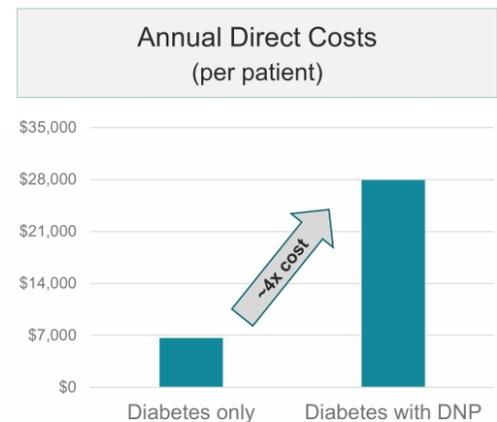
1) Sim-Selley et al., Journal of Pharmacology & Experimental Therapeutics, 2018. 2) Sim-Selley et al., Journal of Neurochemistry, 2008. 3) Gol et al., European Journal of Pharmaceutical Sciences, 2017. 4) Leo et al., CNS & Neurological Disorders - Drug Targets, 2017. 5) Lymphopenia, bradycardia, vascular leakage, macular edema. BBB = blood-brain barrier. Images: flaticon.com.

31

## TRV045 for Diabetic Neuropathic Pain

Diabetic neuropathic pain (DNP) represents a large market opportunity

- 30M+ US adults with diabetes (500M+ worldwide)<sup>1,2</sup>
- DNP affects up to 25% of patients with diabetes<sup>3,8</sup>
- Significant need for efficacious medicines for DNP<sup>4-5</sup>
  - Only ~50% of patients experience a clinical response with currently approved therapies
- Direct costs for patients with DNP were ~4x that of patients with only diabetes (no DNP)<sup>6</sup>

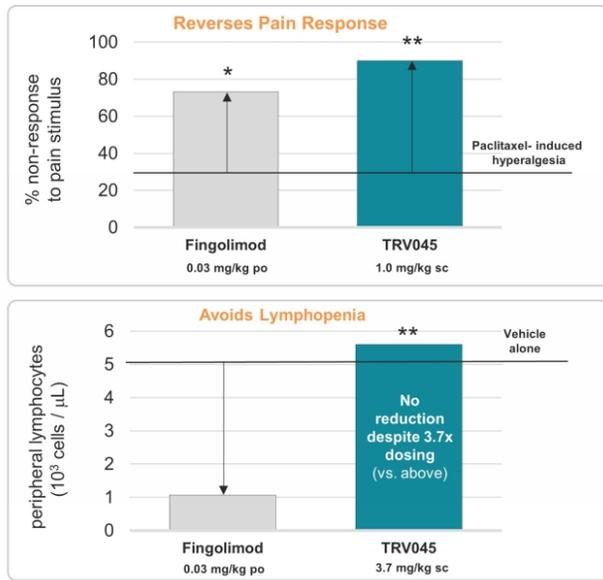


1) IDF, www.diabetesatlas.org 2) Economic Costs of Diabetes in the U.S. in 2017, Diabetes Care 2018;41:917-928. 3) Shillo et al., Current Diabetes Reports, 2019 4) Pritchett, YL et al. Pain Medicine 2007 5) Freeman R et al., Diabetes Care 2008 6) Sadosky et al., J Diabetes Complications 2015. 7) Datamonitor 8) Hicks, et al. Current Diabetes Reports, 2019

32

# TRV045: Novel MOA for Diabetic Neuropathic Pain

5M+ people (US) suffer from DNP, with limited therapeutic options<sup>1</sup>



- DNP affects ~25% of people w/ diabetes<sup>2</sup>
  - Approved agents inadequate for ~50% of patients<sup>3,4</sup>
  - ~4x direct costs for DNP patients (vs diabetes alone)<sup>5</sup>
- In animals, TRV045 reversed neuropathic pain without immune-suppressing activity<sup>6</sup>
- Non-opioid MOA with broad potential for CNS indications
  - Phase 1 for DNP underway
  - Epilepsy evaluation (NIH) ongoing



1) Rosenberger et al., Journal of Neural Transmission, 2020 and CDC National Diabetes Statistics Report, 2020. 2) Shillo et al., Current Diabetes Reports, 2019. 3) American Diabetes Association. 4) FDA product labels for Lyrica, Lyrica CR, Cymbalta, Nucynta ER, and Qutenza, Tesfaye et al. Pain (2013). 5) Sadosky et al., J Diabetes Complications 2015. 6) CIPN mouse model: Paclitaxel 6 mg/kg, i.p. on Days 1, 3, 5, 7. Hyperalgesia measured as % non-response to 0.4 g Von Frey filament vs. baseline, tested 30' after dosing on Day 13. Lymphocytes measured after 3 days of dosing. Data are mean ± s.e.m. n=5-7 mice/group. \*p<0.05 or \*\*p<0.01 vs. control

# TRV250: New MOA for Acute Treatment of Migraine

Delta receptor: Untapped potential in CNS space

Migraine represents a large market opportunity; total migraine drug market = ~\$3.5B

Delta receptors have unique distribution throughout the brain

Play important role in regulation of pain, mood, and anxiety

## Every year in the US<sup>1</sup>:



650M migraines treated each year



1.2M ER visits due to migraines

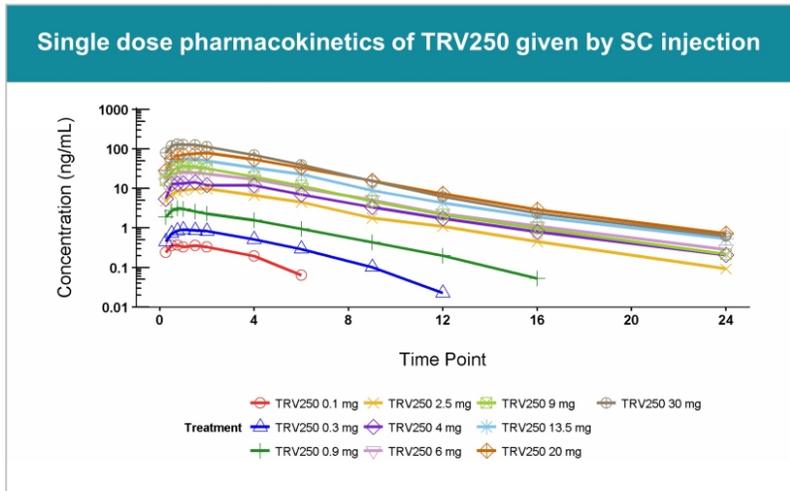
- 20-30% of migraine sufferers do not respond to / cannot tolerate the market-leading triptan drug class
- Approx. 50% of migraineurs also suffer from anxiety<sup>2</sup>



1) Data from Decision Resources, Pharmacor migraine market landscape and forecast 2018. 2) Moven et al., J Neurol Neurosurg Psychiatry, 2016. Icons made by Freepik from www.flaticon.com

# TRV250: Well-Tolerated in Ph1 Healthy Volunteer PK Study

Subcutaneous doses up to 30 mg studied; no SAEs observed



Well tolerated, with no SAEs across broad range of doses

Predictable PK: dose-proportional between 0.1 mg to 30 mg SC

Half-life consistent across all doses

No EEG findings observed in any subject

**IND-enabling activities initiated for new oral dose form**

# TRV734: Maintenance Therapy for Opioid Use Disorder

Selective agonism at  $\mu$  receptor: nonclinical evidence of improved tolerability



## Ongoing collaboration with National Institute on Drug Abuse (NIDA)

NIDA study demonstrated reduced drug-seeking behavior in animal model of relapse<sup>2</sup>

## NIDA-funded proof-of-concept patient study initiated

- Randomized, double-blind, placebo- and positive-controlled study
- N = ~50 opioid-dependent patients undergoing stable methadone maintenance therapy
- **Primary endpoint:** suppression of withdrawal symptoms as measured by the Subjective Opioid Withdrawal Scale
- **Secondary outcomes:** assessments of safety, tolerability, and neurocognitive changes

# Multiple Expected Catalysts

	PRE-CLIN	PHASE 1	PHASE 2	PHASE 3	NDA	POST-APPR	EXPECTED CATALYSTS
<b>OLINVYK®</b> New chemical entity (mu-opioid receptor)	IV acute pain*				APPROVED		• Commercial launch ongoing
				Leiden UMC collab.	Respiratory physiology		• Study completed April 2022
				Cleveland Clinic / Wake Forest Baptist Health collab.	Cognitive function		• Topline data mid-22
					Clinical outcomes		• Topline data 2H 22
					Nhwa NDA Submission in China		• NDA Submitted
<b>TRV027</b> AT <sub>1</sub> receptor selective agonist	COVID-19 ARDS / abnormal clotting				NIH ACTIV collab.		• Topline data 2H 22
	COVID-19 PoC study				Imperial College London collab.		• Topline data announced
<b>TRV045</b> Selective S1P receptor modulator	DNP						• Phase 1 complete 2H 22
	Epilepsy				NIH collab.		
<b>TRV250</b> G-protein selective agonist (delta receptor)	Acute migraine						• IND-enabling activities (oral)
<b>TRV734</b> G-protein selective agonist (mu-opioid receptor)	Opioid use disorder				NIH / NIDA collab.		• POC study ongoing



OLINVYK is indicated in adults for the management of acute pain severe enough to require an intravenous opioid analgesic and for whom alternative treatments are inadequate.

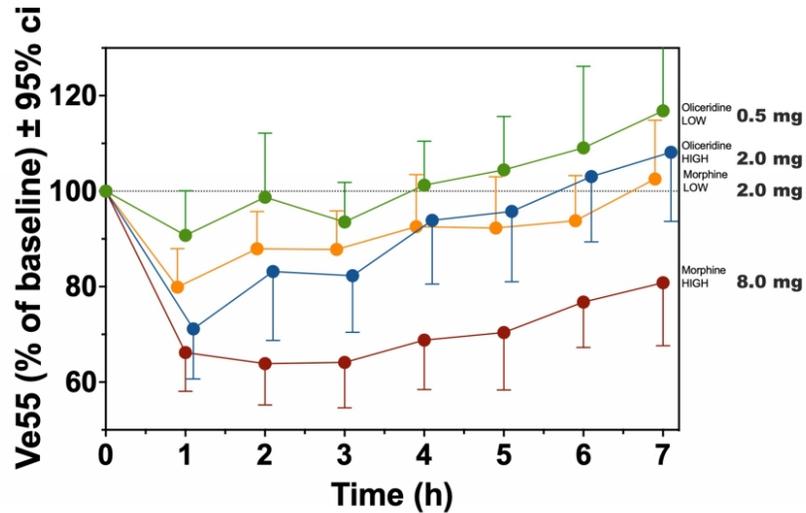
\* Please see Important Safety Information including BOXED WARNING at the end of presentation. Full Prescribing Information at [www.OLINVYK.com](http://www.OLINVYK.com).

TRV250, TRV734, TRV027, and TRV045 are investigational products and are not approved by the FDA or any other regulatory agency.; ARDS = Acute Respiratory Distress Syndrome; ACTIV = Accelerating COVID-19 Therapeutic Interventions and Vaccines; NDA = New Drug Application, PoC = Proof-of-Concept, DNP = Diabetic Neuropathic Pain



## Appendix

# Head-to-Head Comparison of OLINVYK and IV morphine in Elderly/Overweight Subjects (N=18)



As with all opioids, serious, life-threatening, or fatal respiratory depression may occur in patients treated with OLINVYK.

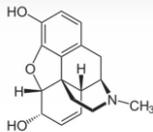


Please see Important Safety Information including BOXED WARNING at the end of presentation. Full Prescribing Information at [www.OLINVYK.com](http://www.OLINVYK.com).

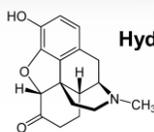
## OLINVYK: Distinct From IV Morphine / Hydromorphone



Morphine



Hydromorphone



Studied in >1,900 individuals



IV morphine included as active comparator



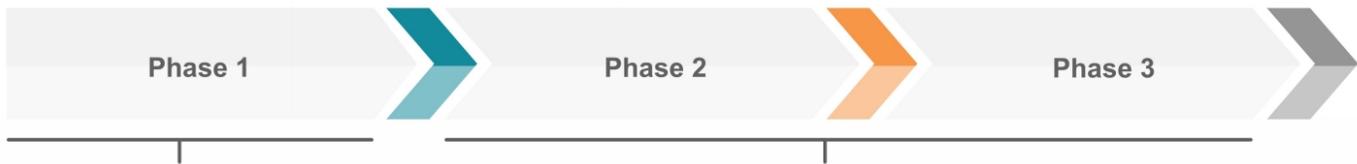
NCE with 2032+ COM patent<sup>1</sup>



Please see Important Safety Information including BOXED WARNING at the end of presentation. Full Prescribing Information at [www.OLINVYK.com](http://www.OLINVYK.com).  
 1) 2032 composition of matter patent expiration does not include potential patent extensions.

# Robust Clinical Development Program

OLINVYK studied in > 1,900 individuals



No dosage adjustments for elderly / renally impaired

No known active metabolites

4 head-to-head trials vs. IV morphine

Large safety study:

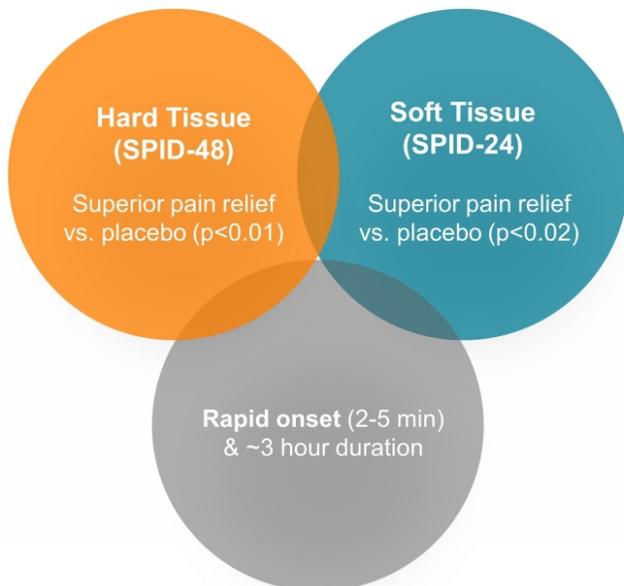
- Real-world use in complex patients and target surgeries



Please see Important Safety Information including BOXED WARNING at the end of presentation. Full Prescribing Information at [www.OLINVYK.com](http://www.OLINVYK.com). # subjects exposed to OLINVYK in Ph1 = 318; # patients treated with OLINVYK in Ph2 and Ph3 = 1,535

41

## OLINVYK: IV Opioid Efficacy and Rapid Onset



- Efficacy achieved in hard tissue & soft tissue models
- Rapid onset: perceptible pain relief within 1-3 minutes
- OLINVYK efficacy data in peer-reviewed journals *The Journal of Pain Research*<sup>1</sup> and *Pain Practice*<sup>2</sup>

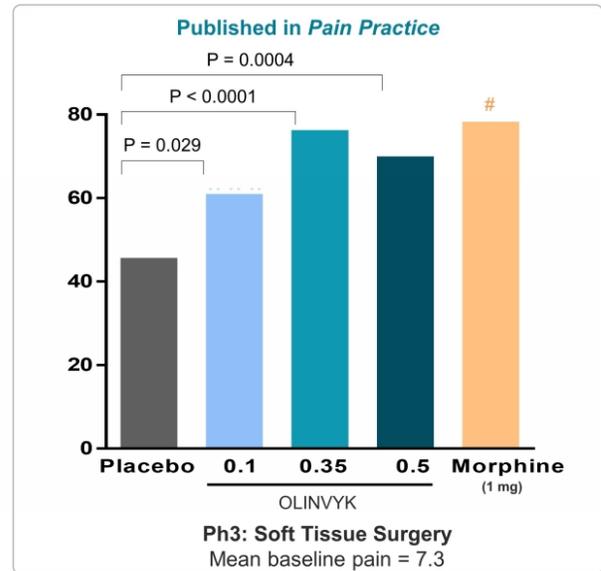
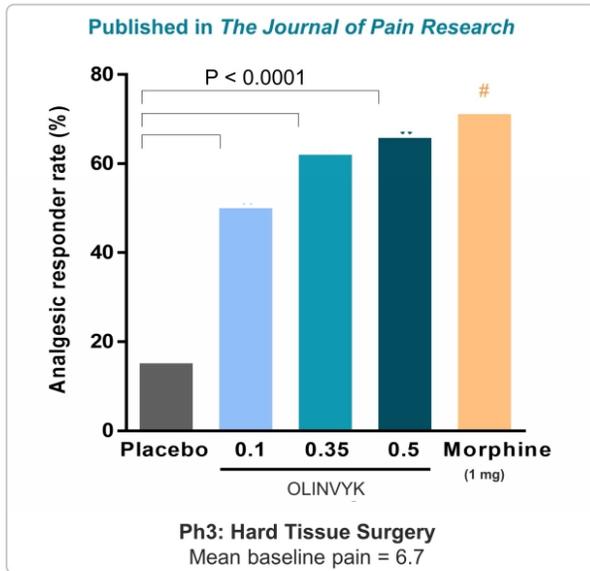


Please see Important Safety Information including BOXED WARNING at the end of presentation. Full Prescribing Information at [www.OLINVYK.com](http://www.OLINVYK.com). 1) Viscusi ER et al. *J Pain Res.* 2019;12:927-943. Published 2019 Mar 11. 2) Singla NK et al. *Pain Pract.* 2019;19:715-731. Published 2019 Jun 04.

42

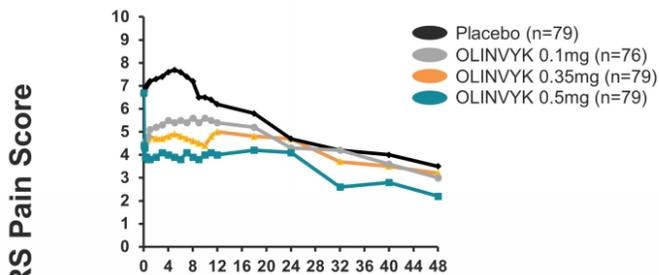
# Primary Efficacy Endpoint Achieved in Two Pivotal Studies

OLINVYK achieved IV opioid efficacy



Please see Important Safety Information including BOXED WARNING at the end of presentation. Full Prescribing Information at [www.OLINVYK.com](http://www.OLINVYK.com). These analyses were the prespecified primary endpoints for both studies. Section 14 of the Prescribing Information includes the SPID-24 and SPID-48 efficacy analyses that were the basis for approval. Viscusi ER et al. J Pain Res. 2019;12:927-943. Published 2019 Mar 11. Singla NK et al. Pain Pract. 2019;19:715-731. Published 2019 Jun 04. #p < 0.05 vs. placebo (unadjusted).

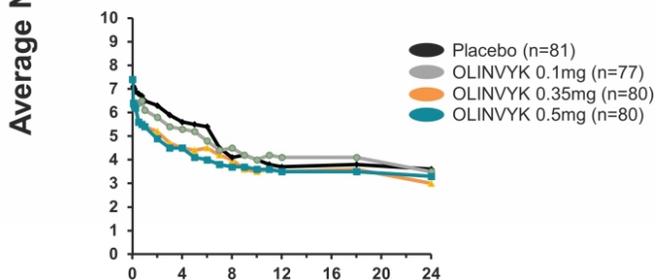
## OLINVYK: IV Opioid Efficacy in 2 Phase 3 RCTs



### Study 1 (Orthopedic – Hard Tissue)

3 PCA regimens studied (0.1, 0.35, 0.5 mg) vs. placebo; all doses P<0.01 vs. placebo

Outcome	OLINVYK			Placebo
	0.1 mg	0.35 mg	0.5 mg	
% Completed	83%	87%	84%	60%
% D/C LOE	9%	4%	5%	34%
% Rescue Meds	41%	20%	17%	77%



### Study 2 (Plastic Surgery – Soft Tissue)

3 PCA regimens studied (0.1, 0.35, 0.5 mg) vs. placebo; 0.35 / 0.5 mg doses P<0.02 vs. placebo

Outcome	OLINVYK			Placebo
	0.1 mg	0.35 mg	0.5 mg	
% Completed	86%	90%	87%	74%
% D/C LOE	11%	3%	5%	22%
% Rescue Meds	31%	21%	18%	49%

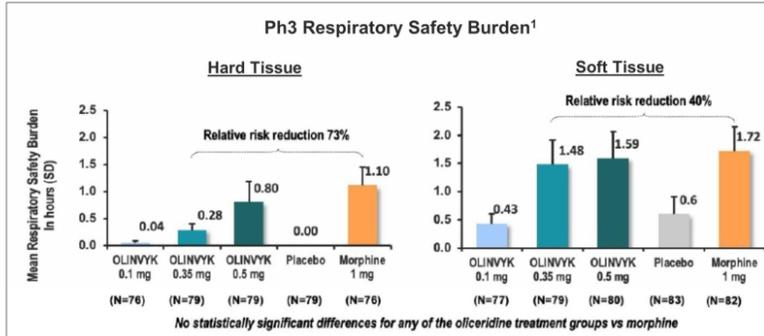


Please see Important Safety Information including BOXED WARNING at the end of presentation. Full Prescribing Information at [www.OLINVYK.com](http://www.OLINVYK.com).

# Robust Assessment of Respiratory Safety in Phase 3 RCTs

Data included in AMCP dossier used in formulary review

- Prespecified secondary endpoint: Respiratory Safety Burden (RSB)
  - Calculated based on incidence and cumulative duration of respiratory safety events
- Full characterization of respiratory safety profile has been made available to HCPs and formulary decision makers
  - Data can be found in OLINVYK AMCP dossier and published literature



## Ph3 Respiratory Safety Events<sup>2</sup> (Components of the RSB calculation)

### Hard Tissue

Orthopedic Surgery- Unionectomy Study	Placebo (N=79)	Demand Dose OLINVYK			Morphine 1 mg (N=76)
		0.1 mg (N=76)	0.35 mg (N=79)	0.5 mg (N=79)	
<b>Components of the respiratory safety burden</b>					
≥1 respiratory safety event, n (%)	0	1 (1.3)	7 (8.9)	11 (13.9)	14 (18.4)
P value vs morphine	0.006	0.002	0.050	0.364	-
Duration of event, mean hours (SD)	0 (N/E)	2.88 (N/E)	3.21 (2.24)	5.72 (7.44)	5.96 (4.67)
P value vs morphine	0.102	0.140	0.260	0.186	-
<b>Respiratory safety event measures</b>					
Oxygen saturation <90%, n (%)	1 (1.3)	3 (3.9)	8 (10.1)	11 (13.9)	15 (19.7)
P value vs morphine	0.005	0.006	0.100	0.352	-
Respiratory rate ≤8 bpm, n (%)	0	0	1 (1.3)	1 (1.3)	4 (5.3)
P value vs morphine	0.956	0.956	0.188	0.185	-
Sedation (MRPSS ≥3), n (%)	10 (2.7)	14 (18.4)	16 (20.3)	13 (16.5)	15 (19.7)
P value vs morphine	0.242	0.838	0.926	0.610	-

### Soft Tissue

Plastic Surgery- Abdominoplasty Study	Placebo (N=77)	Demand Dose OLINVYK			Morphine 1 mg (N=82)
		0.1 mg (N=77)	0.35 mg (N=79)	0.5 mg (N=80)	
<b>Components of the respiratory safety burden</b>					
≥1 respiratory safety event, n (%)	5 (6.0)	6 (7.8)	17 (21.5)	18 (22.5)	22 (26.8)
Odds ratio vs morphine	0.15	0.19	0.61	0.68	-
P value vs morphine	0.0003	0.0007	0.20	0.32	-
Duration of event, mean hours (SD)	9.88 (7.0)	5.51 (1.91)	6.88 (5.66)	7.07 (6.56)	6.40 (5.09)
P value vs morphine	0.52	0.29	0.76	0.76	-
<b>Respiratory safety event measures</b>					
Oxygen saturation <90%, n (%)	7 (8.4)	6 (7.8)	15 (19.0)	16 (20.0)	20 (24.4)
P value vs morphine	0.02	0.01	0.57	0.76	-
Respiratory rate ≤8 bpm, n (%)	1 (1.2)	0	4 (5.1)	6 (7.5)	8 (9.8)
P value vs morphine	0.054	0.95	0.38	0.84	-
Sedation (MRPSS ≥3), n (%)	15 (18.1)	8 (10.4)	19 (24.1)	18 (22.5)	21 (25.6)
P value vs morphine	0.25	0.02	0.83	0.65	-

bpm = breaths per minute; MRPSS = Moline-Roberts Pharmacologic Sedation Scale

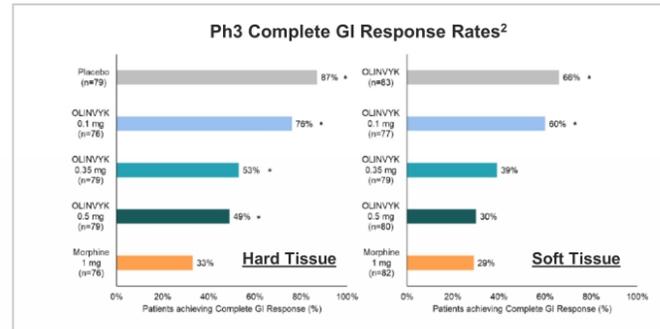
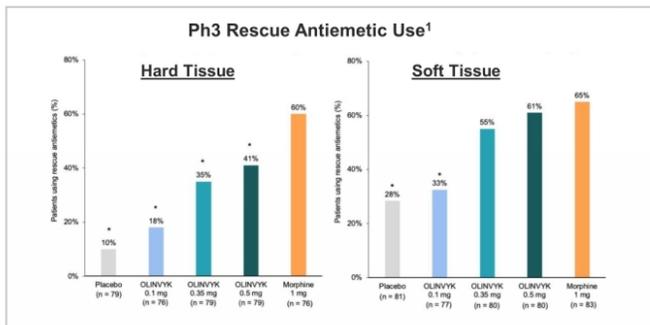
As with all opioids, serious, life-threatening, or fatal respiratory depression may occur in patients treated with OLINVYK.



1) Figure 2-8, Section 2.2, OLINVYK Evidence Dossier for Formulary Consideration. 2) Figures 3-4 and 3-8, Section 3.1, OLINVYK Evidence Dossier for Formulary Consideration.

# Robust Assessment of GI Tolerability in Phase 3 RCTs

Data included in AMCP dossier used in formulary review



- Phase 3 pivotal trials included measurements of nausea / vomiting rates and rescue antiemetic use
- Additional exploratory post-hoc analysis was conducted using a “complete GI response” endpoint<sup>3</sup>
- Full characterization of GI tolerability has been made available to HCPs and formulary decision makers
  - Data can be found in OLINVYK AMCP dossier and published literature



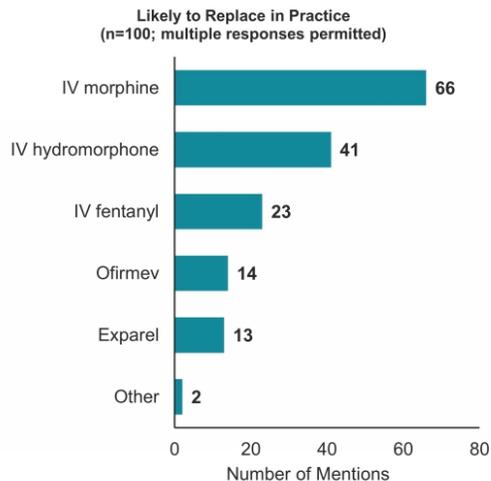
P < 0.05 vs. morphine. 1) Figure 2-10, Section 2.2, OLINVYK Evidence Dossier for Formulary Consideration. 2) Figure 2-11, Section 2.2, OLINVYK Evidence Dossier for Formulary Consideration. 3) GI complete response defined as the proportion of patients who did not experience the AE of vomiting and did not use rescue antiemetic medication throughout their allocated treatment period in the study.

# Positive Feedback from Formulary Stakeholders<sup>1</sup>

~75% of formulary stakeholders find OLINVYK's published data clinically meaningful:<sup>2</sup>



Majority of stakeholders view IV morphine as likely to be replaced by OLINVYK:



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1) Qualitative Pricing research, Charles River Associates, April 2020. 2) "Are the improvements in respiratory safety events and GI tolerability clinically meaningful?" Based on OLINVYK Ph3 clinical trial data.

# Omni-channel Approach for HCP Engagement

Communication across a full range of channels to maximize reach and impact



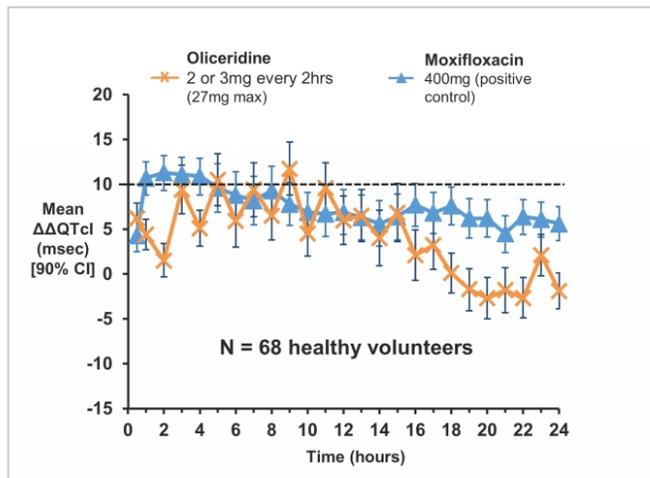
- Field directed: live, virtual & email
- HCP social media
- Professional Society Meetings & Congresses
- Olinvyk.com
- Virtual "on demand" Medical Education programs



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# No Accumulation Despite Repeated Dosing

## Multi-Dose tQT Study



## Key results

- **No accumulation through 24 hrs**  
Mean QTcI <10ms at 22 of 24 points
- **No categorical QTc outliers**  
 $\Delta >60$  ms;  $>500$  ms absolute
- **Well tolerated, no SAEs\***  
92% reached max daily dose

\*The effect on QT prolongation at total cumulative daily doses  $>27$  mg has not been studied in a thorough QT study. Total cumulative daily doses exceeding 27 mg per day may increase the risk for QTc interval prolongation. Therefore, the cumulative total daily dose of OLINVYK should not exceed 27 mg.



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3 subjects not dosed due to lack of venous access; 1 discontinuation due to a non-serious adverse event (asymptomatic non-sustained ventricular tachycardia) with confounding hypokalemia and no meaningful QT prolongation during dosing; 1 subject completed dosing but not evaluable due to equipment malfunction



## IMPORTANT SAFETY INFORMATION

**WARNING: ADDICTION, ABUSE, AND MISUSE; LIFE-THREATENING RESPIRATORY DEPRESSION; NEONATAL OPIOID WITHDRAWAL SYNDROME; and RISKS FROM CONCOMITANT USE WITH BENZODIAZEPINES OR OTHER CENTRAL NERVOUS SYSTEM (CNS) DEPRESSANTS**

**Addiction, Abuse, and Misuse**

OLINVYK exposes patients and other users to the risks of opioid addiction, abuse, and misuse, which can lead to overdose and death. Assess each patient's risk before prescribing OLINVYK, and monitor all patients regularly for the development of behaviors or conditions.

**Life-Threatening Respiratory Depression**

Serious, life-threatening, or fatal respiratory depression may occur with use of OLINVYK. Monitor for respiratory depression, especially during initiation of OLINVYK or following a dose increase.

**Neonatal Opioid Withdrawal Syndrome**

Prolonged use of OLINVYK during pregnancy can result in neonatal opioid withdrawal syndrome, which may be life-threatening if not recognized and treated, and requires management according to protocols developed by neonatology experts. If opioid use is required for a prolonged period in a pregnant woman, advise the patient of the risk of neonatal opioid withdrawal syndrome and ensure that appropriate treatment will be available.

**Risk From Concomitant Use With Benzodiazepines or Other CNS Depressants**

Concomitant use of opioids with benzodiazepines or other CNS depressants, including alcohol, may result in profound sedation, respiratory depression, coma, and death. Reserve concomitant prescribing for use in patients for whom alternative treatment options are inadequate; limit dosages and durations to the minimum required; and follow patients for signs and symptoms of respiratory depression and sedation.

**INDICATIONS AND USAGE**

OLINVYK is a new chemical entity indicated in adults for the management of acute pain severe enough to require an intravenous opioid analgesic and for whom alternative treatments are inadequate.



**Limitations of Use**

Because of the risks of addiction, abuse, and misuse with opioids, even at recommended doses, reserve OLINVYK for use in patients for whom alternative treatment options [e.g., non-opioid analgesics or opioid combination products]:

- Have not been tolerated, or are not expected to be tolerated
- Have not provided adequate analgesia, or are not expected to provide adequate analgesia.

The cumulative total daily dose should not exceed 27 mg, as total daily doses greater than 27 mg may increase the risk for QTc interval prolongation.

**CONTRAINDICATIONS**

OLINVYK is contraindicated in patients with:

- Significant respiratory depression
- Acute or severe bronchial asthma in an unmonitored setting or in the absence of resuscitative equipment
- Known or suspected gastrointestinal obstruction, including paralytic ileus
- Known hypersensitivity to oliceridine (e.g., anaphylaxis)

**WARNINGS AND PRECAUTIONS**

- OLINVYK contains oliceridine, a Schedule II controlled substance, that exposes users to the risks of addiction, abuse, and misuse. Although the risk of addiction in any individual is unknown, it can occur in patients appropriately prescribed OLINVYK. Assess risk, counsel, and monitor all patients receiving opioids.
- Serious, life-threatening respiratory depression has been reported with the use of opioids, even when used as recommended, especially in patients with chronic pulmonary disease, or in elderly, cachectic and debilitated patients. The risk is greatest during initiation of OLINVYK therapy, following a dose increase, or when used with other drugs that depress respiration. Proper dosing of OLINVYK is essential, especially when converting patients from another opioid product to avoid overdose. Management of respiratory depression may include close observation, supportive measures, and use of opioid antagonists, depending on the patient's clinical status.
- Opioids can cause sleep-related breathing disorders including central sleep apnea (CSA) and sleep-related hypoxemia with risk increasing in a dose-dependent fashion. In patients who present with CSA, consider decreasing the dose of opioid using best practices for opioid taper.

**WARNINGS AND PRECAUTIONS**

- Prolonged use of opioids during pregnancy can result in withdrawal in the neonate that may be life-threatening. Observe newborns for signs of neonatal opioid withdrawal syndrome and manage accordingly. Advise pregnant women using OLINVYK for a prolonged period of the risk of neonatal opioid withdrawal syndrome and ensure that appropriate treatment will be available.
- Profound sedation, respiratory depression, coma, and death may result from the concomitant use of OLINVYK with benzodiazepines or other CNS depressants (e.g., non-benzodiazepine sedatives/hypnotics, anxiolytics, tranquilizers, muscle relaxants, general anesthetics, antipsychotics, other opioids, or alcohol). Because of these risks, reserve concomitant prescribing of these drugs for use in patients for whom alternative treatment options are inadequate, prescribe the lowest effective dose, and minimize the duration.
- OLINVYK was shown to have mild QTc interval prolongation in thorough QT studies where patients were dosed up to 27 mg. Total cumulative daily doses exceeding 27 mg per day were not studied and may increase the risk for QTc interval prolongation. Therefore, the cumulative total daily dose of OLINVYK should not exceed 27 mg.
- Increased plasma concentrations of OLINVYK may occur in patients with decreased Cytochrome P450 (CYP) 2D6 function or normal metabolizers taking moderate or strong CYP2D6 inhibitors; also in patients taking a moderate or strong CYP3A4 inhibitor, in patients with decreased CYP2D6 function who are also receiving a moderate or strong CYP3A4 inhibitor, or with discontinuation of a CYP3A4 inducer. These patients may require less frequent dosing and should be closely monitored for respiratory depression and sedation at frequent intervals. Concomitant use of OLINVYK with CYP3A4 inducers or discontinuation of a moderate or strong CYP3A4 inhibitor can lower the expected concentration, which may decrease efficacy, and may require supplemental doses.
- Cases of adrenal insufficiency have been reported with opioid use (usually greater than one month). Presentation and symptoms may be nonspecific and include nausea, vomiting, anorexia, fatigue, weakness, dizziness, and low blood pressure. If confirmed, treat with physiologic replacement doses of corticosteroids and wean patient from the opioid.
- OLINVYK may cause severe hypotension, including orthostatic hypotension and syncope in ambulatory patients.
- There is increased risk in patients whose ability to maintain blood pressure has already been compromised by a reduced blood volume or concurrent administration of certain CNS depressant drugs (e.g., phenothiazines or general anesthetics). Monitor these patients for signs of hypotension. In patients with circulatory shock, avoid the use of OLINVYK as it may cause vasodilation that can further reduce cardiac output and blood pressure.
- Avoid the use of OLINVYK in patients with impaired consciousness or coma. OLINVYK should be used with caution in patients who may be susceptible to the intracranial effects of CO<sub>2</sub> retention, such as those with evidence of increased intracranial pressure or brain tumors, as a reduction in respiratory drive and the resultant CO<sub>2</sub> retention can further increase intracranial pressure. Monitor such patients for signs of sedation and respiratory depression, particularly when initiating therapy.
- As with all opioids, OLINVYK may cause spasm of the sphincter of Oddi, and may cause increases in

serum amylase. Monitor patients with biliary tract disease, including acute pancreatitis, for worsening symptoms.

- There is increased risk in patients whose ability to maintain blood pressure has already been compromised by a reduced blood volume or concurrent administration of certain CNS depressant drugs (e.g., phenothiazines or general anesthetics). Monitor these patients for signs of hypotension. In patients with circulatory shock, avoid the use of OLINVYK as it may cause vasodilation that can further reduce cardiac output and blood pressure.
- Avoid the use of OLINVYK in patients with impaired consciousness or coma. OLINVYK should be used with caution in patients who may be susceptible to the intracranial effects of CO<sub>2</sub> retention, such as those with evidence of increased intracranial pressure or brain tumors, as a reduction in respiratory drive and the resultant CO<sub>2</sub> retention can further increase intracranial pressure. Monitor such patients for signs of sedation and respiratory depression, particularly when initiating therapy.
- As with all opioids, OLINVYK may cause spasm of the sphincter of Oddi, and may cause increases in serum amylase. Monitor patients with biliary tract disease, including acute pancreatitis, for worsening symptoms.
- OLINVYK may increase the frequency of seizures in patients with seizure disorders and may increase the risk of seizures in vulnerable patients. Monitor patients with a history of seizure disorders for worsened seizure control.
- Do not abruptly discontinue OLINVYK in a patient physically dependent on opioids. Gradually taper the dosage to avoid a withdrawal syndrome and return of pain. Avoid the use of mixed agonist/antagonist (e.g., pentazocine, nalbuphine, and butorphanol) or partial agonist (e.g., buprenorphine) analgesics in patients who are receiving OLINVYK, as they may reduce the analgesic effect and/or precipitate withdrawal symptoms.
- OLINVYK may impair the mental or physical abilities needed to perform potentially hazardous activities such as driving a car or operating machinery.
- Although self-administration of opioids by patient-controlled analgesia (PCA) may allow each patient to individually titrate to an acceptable level of analgesia, PCA administration has resulted in adverse outcomes and episodes of respiratory depression. Health care providers and family members monitoring patients receiving PCA analgesia should be instructed in the need for appropriate monitoring for excessive sedation, respiratory depression, or other adverse effects of opioid medications.

**ADVERSE REACTIONS**

Adverse reactions are described in greater detail in the Prescribing Information.

The most common (incidence ≥10%) adverse reactions in Phase 3 controlled clinical trials were nausea, vomiting, dizziness, headache, constipation, pruritus, and hypoxia.

PLEASE see [www.OLINVYK.com](http://www.OLINVYK.com) for full prescribing information including **BOXED** warning and important safety information