AcelRx Pharmaceuticals, Inc.

Innovative products for medically supervised settings

Nasdaq: ACRX

October 2023

Forward-looking statements and non-GAAP financial measures

Forward-Looking Statements

Some of the information in this presentation is not historical in nature and may constitute forward-looking statements, which are made pursuant to the safe harbor provisions of the Private Securities Litigation Reform Act of 1995. These statements may be identified by the use of forward-looking terminology such as “believes,” “expects,” “anticipates,” “may,” “will,” “should,” “seeks,” “approximately,” “intends,” “plans,” “estimates,” or the negative of these words or other comparable terminology. The discussion of financial trends, strategy, plans or intentions may also include forward-looking statements. These forward-looking statements involve risks and uncertainties that could cause actual results to differ materially from those projected, anticipated or implied by such statements. Although it is not possible to predict or identify all such risks and uncertainties, they may include, but are not limited to, those described in the Company’s annual, quarterly and current reports (i.e., Form 10-K, Form 10-Q and Form 8-K) as filed or furnished with the Securities and Exchange Commission (SEC). You are cautioned not to place undue reliance on any such forward-looking statements, which speak only as of the date such statements were first made. To the degree financial information is included in this presentation, it is in summary form only and must be considered in the context of the full details provided in the Company’s most recent annual, quarterly or current report as filed or furnished with the SEC. The Company’s SEC reports are available at www.acelrx.com under the “Investors” tab. Except to the extent required by law, the Company undertakes no obligation to publicly release the result of any revisions to these forward-looking statements to reflect events or circumstances after the date hereof, or to reflect the occurrence of unanticipated events.

Non-GAAP Financial Measures

To supplement AcelRx’s financial results and guidance presented in accordance with U.S. generally accepted accounting principles (GAAP), the company uses certain non-GAAP financial measures in this presentation, in particular, excluding stock-based compensation expense from its operating expenses. The company believes that this non-GAAP financial measure provides useful supplementary information to, and facilitates additional analysis by, investors and analysts.

Portfolio Overview

Approval

Product	Administration	Phase 1	Phase 2	Phase 3	NDA submitted	Next anticipated milestone
Nafamostat product candidates						
Niyad™	Anticoagulation of the extracorporeal circuit–CRRT/IHD regulated as device					Registrational study expected to be initiated in Q4 2023 with PMA submission in 2024
LTX-608	Various indications regulated as drugs *					
Pre-filled syringe product candidates						
Fedsyra™ 	Ephedrine hydrochloride 10 ml ready to use pre-filled syringe					NDA submission expected in 2023
PFS-02 	Phenylephrine hydrochloride 10 ml ready to use pre-filled syringe					NDA submission expected in 2024

DSUVIA® (sufentanil) sublingual tablet 30 mcg Ⓒ II 

Divested to Alora Pharmaceuticals, and due **15%** royalties on commercial sales; **75%** royalties on sales to the Department of Defense, and up to **$116.5M** in milestone payments; Transaction closed in April 2023

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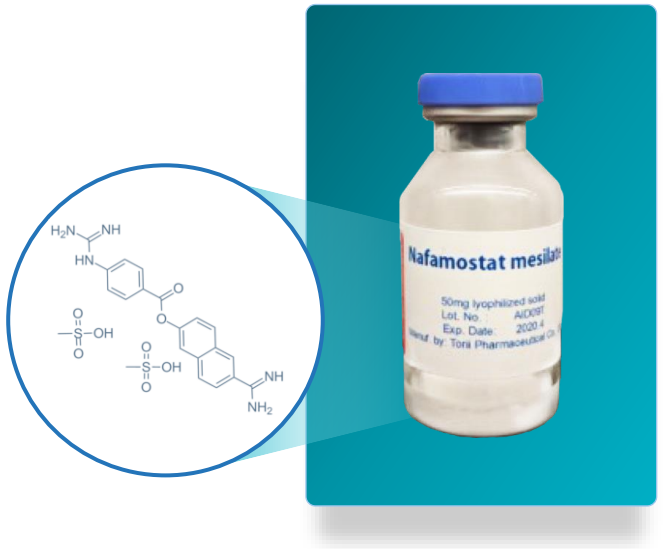
* Post-toxicology, expect to be in phase 2 development

AcelRx Investment Highlights

1. Late-stage pipeline assets with near-term commercial potential in medically supervised settings
2. Lead asset Niyad has FDA Breakthrough Designation with potential peak sales of $200M
3. Single registrational study for Niyad planned to begin enrolling in Q4 2023; 166 total patient study, expected 6-8 months timing followed by PMA submission in 2024; we believe high probability of success
4. Fedsyra™, ephedrine pre-filled syringe NDA submission expected in H2 2023
5. Royalty stream from April 2023 divestment of DSUVIA to Alora Pharmaceuticals - 15% on commercial sales, 75% on DoD sales and up to $116.5M in milestones

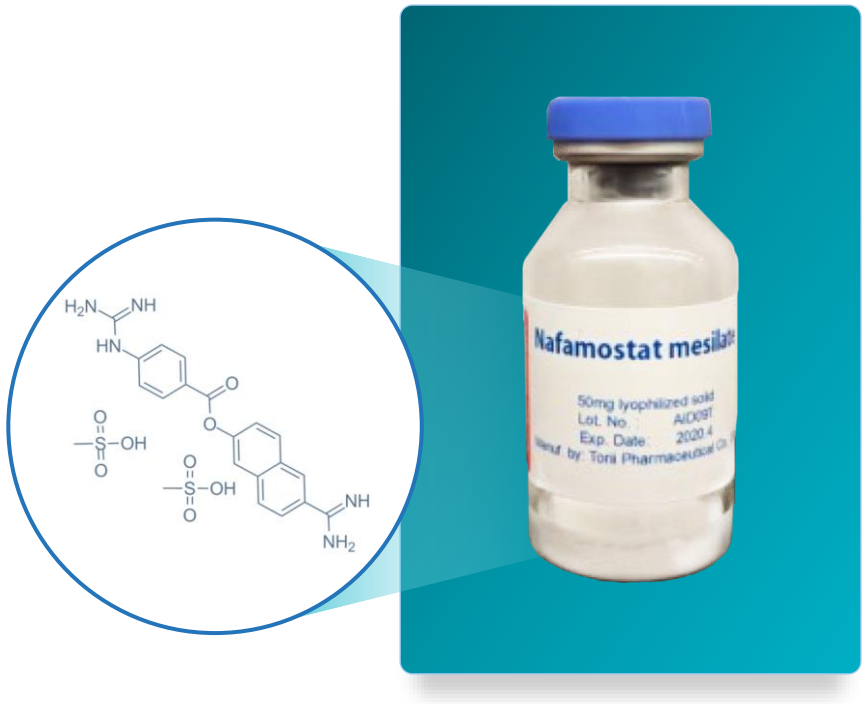


Nafamostat portfolio

Niyad™ and LTX-608

What is nafamostat?

- An investigational broad-spectrum serine protease inhibitor with anticoagulant, anti-inflammatory, mucus clearing and potential anti-viral activities
- Half-life of 8 minutes
- Multiple potential indications given its proposed mechanism of action
- Approved and used in Japan and South Korea for over 30 years
  - Anticoagulation of the extracorporeal circuit
  - Disseminated intravascular coagulation (DIC)
  - Acute pancreatitis
- Various studies performed outside the U.S. for COVID, Acute Respiratory Distress Syndrome (ARDS), Dengue fever and numerous other diseases



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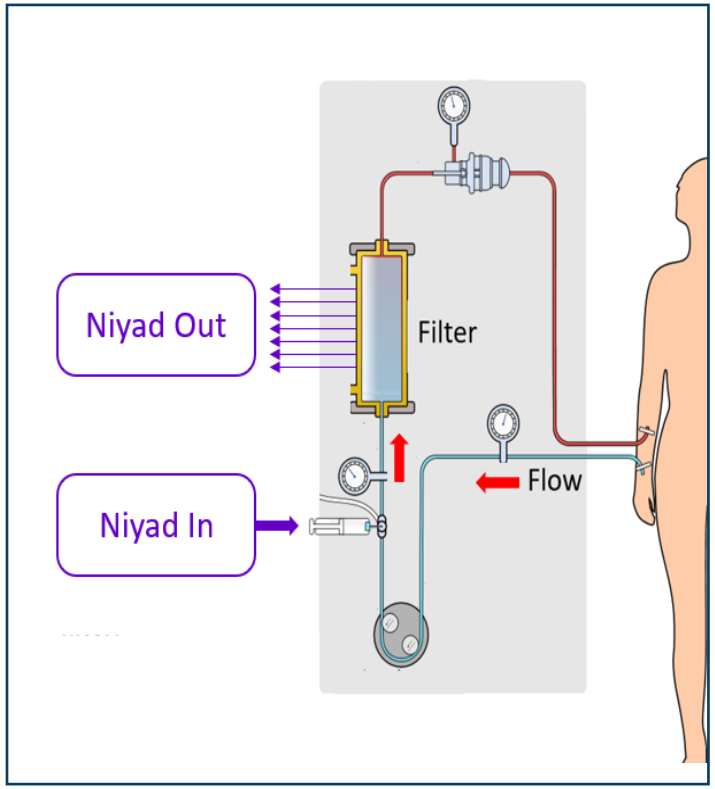
Niyad™ is our lead nafamostat product candidate

AcelRx is evaluating nafamostat as an anticoagulant for the extracorporeal circuit (blood path outside patient)

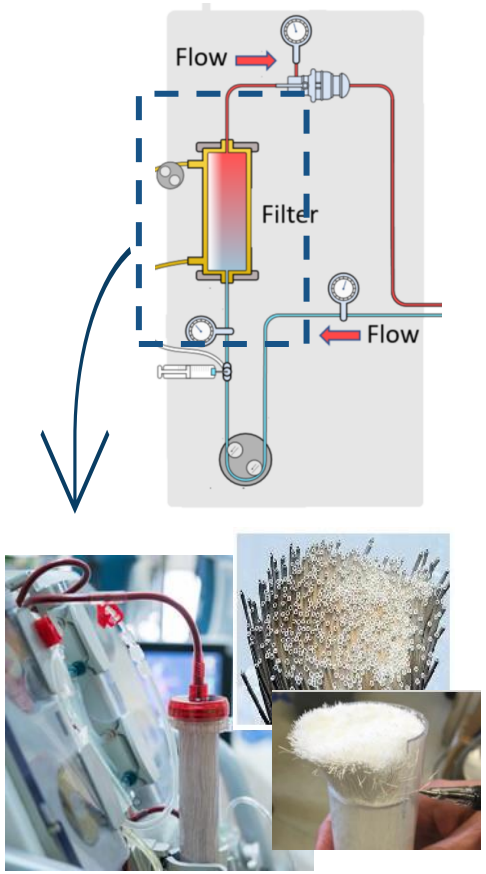
- ✓ Niyad has numerous potential **benefits** compared to the standard of care
- ✓ There are **no FDA-approved** regional anti-coagulants for the extracorporeal circuit
- ✓ Niyad is being regulated as a device (as it works in the circuit and not the body)
  - Granted **FDA Breakthrough Device Designation** status for use as a regional anticoagulant in patients receiving CRRT that cannot tolerate heparin or are at a higher risk of bleeding, providing regulatory and developmental benefits
- ✓ Approval for a **single registrational study** planned to start in Q4 2023 with endpoints agreed with the FDA
- ✓ ICD-10 CMS procedural code already received for **reimbursement**
- ✓ Niyad peak sales estimated at more than **$200 million**



Exposure of blood to the dialysis filter causes clotting

Clotting of the dialysis filter during CRRT is a major limitation to care, as it leads to inefficient dialysis, causes blood loss, and depletes limited resources[1]. Circuit clotting is the most frequent cause of therapy interruption circuit dialysis[2]

- More frequent filter changes required to ensure efficacy
- Increased blood loss; increased platelet transfusions
- Delayed/prolonged treatment time
- Burden on healthcare professional

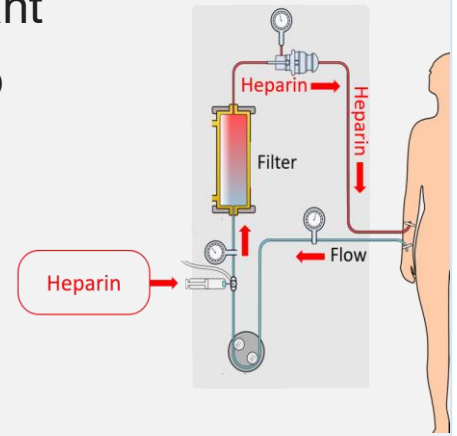


1. Uchino S, Fealy N, Baldwin I, Morimatsu H, Bellomo R. Continuous is not continuous: the incidence and impact of circuit “down-time” on uraemic control during continuous veno-venous haemofiltration. Intensive Care Med. 2003;29:575–578. Zhang Z, Ni H, Lu B. Variables associated with circuit life span in critically ill patients undergoing continuous renal replacement therapy: a prospective observational study. ASAIO J. 2012;58:46–50 2. Clinical review: Patency of the circuit in continuous renal replacement therapy.Joannidis M, Oudemans-van Straaten HM
Crit Care. 2007; 11(4):218.

Current standards for anticoagulation have many disadvantages

Heparin

- Systemic anticoagulant
- Prolonged half-life up to 6 hours makes it difficult to titrate
- Clinicians fear over anticoagulating the patient
- Significant safety concern for patients at risk of bleeding
- Thrombocytopenia



Citrate

- Citrate chelates calcium, which inhibits the generation of thrombin
- Using citrate requires infusing calcium on the return side of filter (back to patient)
- Extensive, complicated protocol
- Frequent blood draws to measure calcium are time-consuming and expensive
- Rapid changes in calcium levels which can cause hypotension, ventricular fibrillation, and possibly cardiac arrest.
- Even more complicated in patients with liver failure

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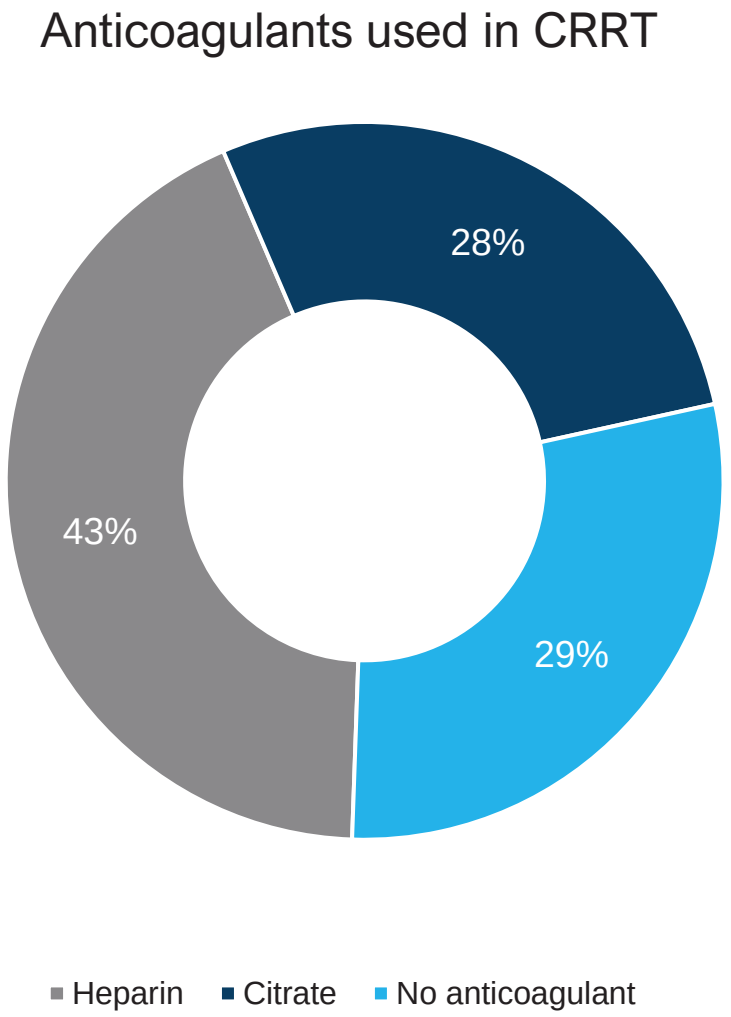
1) Ohtake Y. Nafamostat as Anticoagulant in Continuous HD. Contrib Nephrol. 1991;93;215-217.

The current market landscape for anticoagulants used during continuous renal replacement therapy (CRRT)

Heparin – 43%
(systemic anticoagulant – anticoagulation of the patient and the circuit)

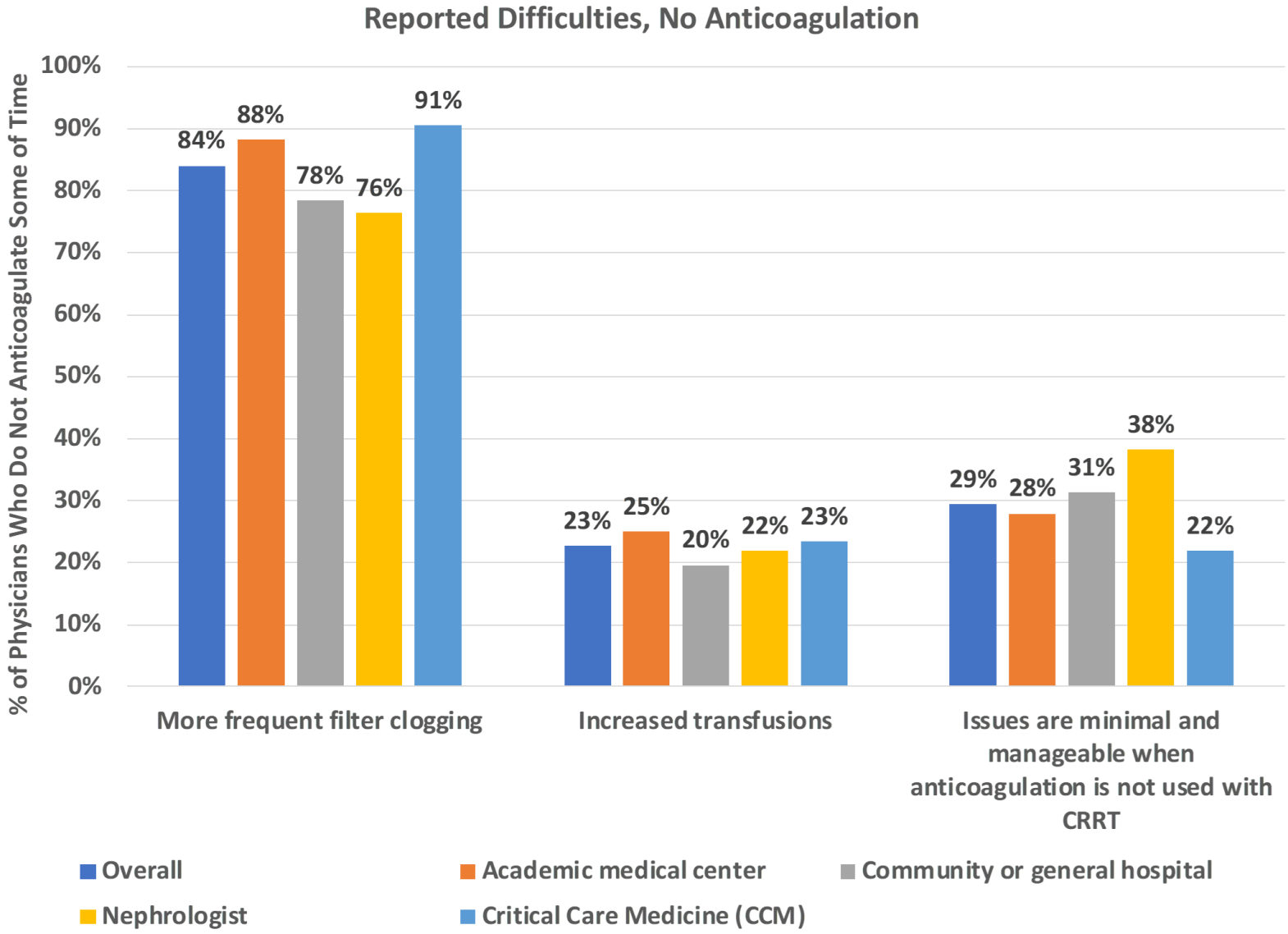


Citrate – 28%
(regional anticoagulant – anticoagulant for circuit only; used in U.S. under an Emergency Use Authorization)

No anticoagulant
29% is unfortunately the default when physicians are concerned with safety of heparin or citrate

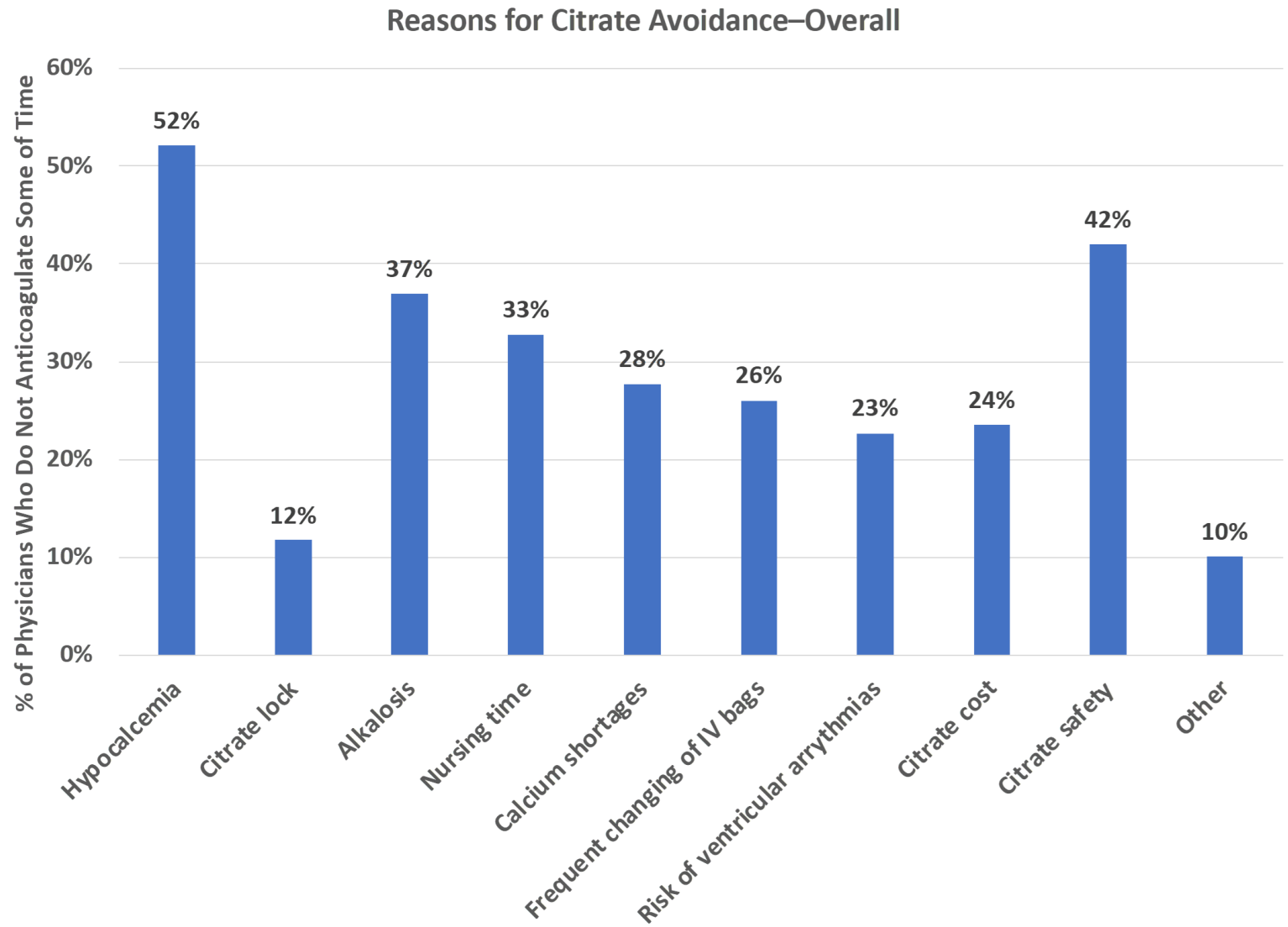
Source: 2022 AcelRx market research

When not using an anticoagulant for CRRT, frequent filter clogging was the most common issue, with 20-25% stating increased transfusions were needed



Source: 2022 AcelRx market research

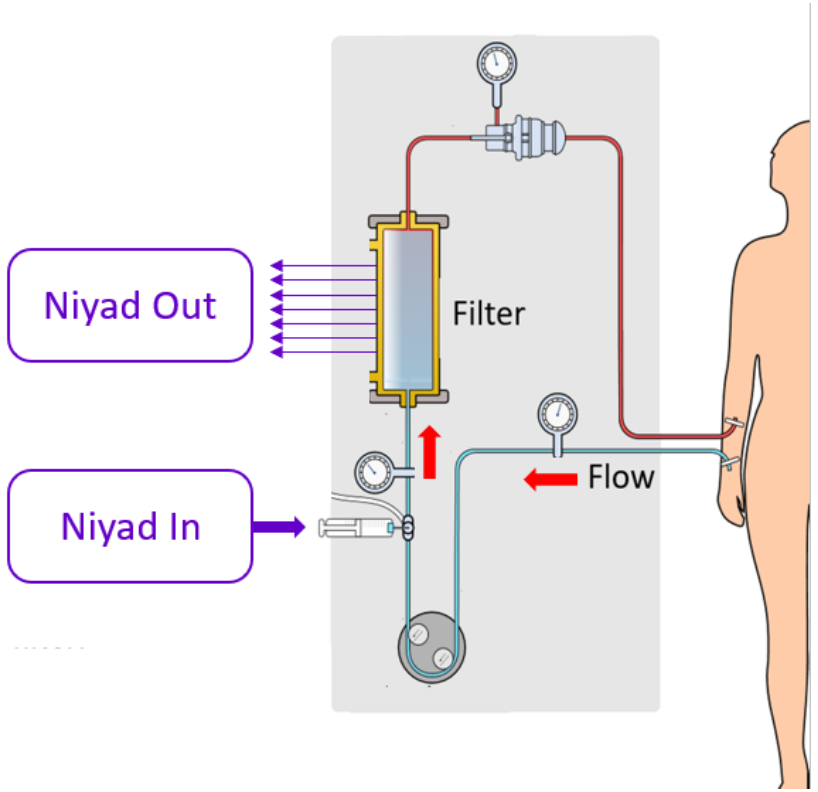
Market research indicated a number of reasons why physicians decide not to use citrate as an anticoagulant during CRRT despite it being given an EUA



Source: 2022 AcelRx market research

Potential benefits of using Niyad in the dialysis circuit

- Standardized international guidelines recommend using an anticoagulant during renal replacement therapy (RRT)
- Niyad is designed to provide a short half-life, titratable, regional anticoagulation without the shortcomings of heparin or citrate
- Potential advantages of Niyad:
  - Niyad designed to be used in patients at risk of bleeding, whereas heparin is limited
  - Niyad designed to be used easily in patients with liver failure – whereas citrate is limited
- Compared to no anticoagulation: potential for fewer filter changes, fewer transfusions, more importantly – lower cost of doctor and nursing time



	Heparin	Nafamostat
Incidence of Bleeding[1]	66.7 %	4.3 %

1) Ohtake Y. Nafamostat as Anticoagulant in Continuous HD. Contrib Nephrol. 1991;93;215-217.

Decades of use outside the U.S. and numerous studies support the benefits of nafamostat as an anticoagulant for the extracorporeal circuit

An independent, meta-analysis published in 2022 on the use of nafamostat as an anticoagulant in the extracorporeal circuit demonstrates the efficacy and safety compared to conventional therapy

11
studies

2,723
patients

Mortality

25% lower with nafamostat vs. conventional therapy (31% lower vs. no-anticoagulant)

Bleeding Risk

45% higher risk of bleeding complications on conventional therapy vs. nafamostat

Filter life

10.5 hours longer filter life compared to no-anticoagulant

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Source: Yao Lin, et al; RENAL FAILURE, 2022, VOL. 44, NO. 1, 1263–1279, https://doi.org/10.1080/0886022X.2022.2105233

FDA feedback on Emergency Use Authorization (EUA) for Niyad

Although EUA for Niyad was not considered an FDA priority due to lack of FDA resources, correspondence with FDA provided us with encouraging feedback

FDA opined on 8/24/21:

> "We believe that your device has the potential to address an unmet need in patients who cannot tolerate heparin or….who are treated in facilities that are ill-equipped for use of a citrate anticoagulant."

> "Additionally, we recognize that there may be an unmet need for patients…who also cannot tolerate citrate due to another condition such as liver disease."

> "We believe that you have provided significant evidence demonstrating that the potential benefits of the Niyad device could be greater than the reasonably foreseen risks."

Single registrational study on Niyad

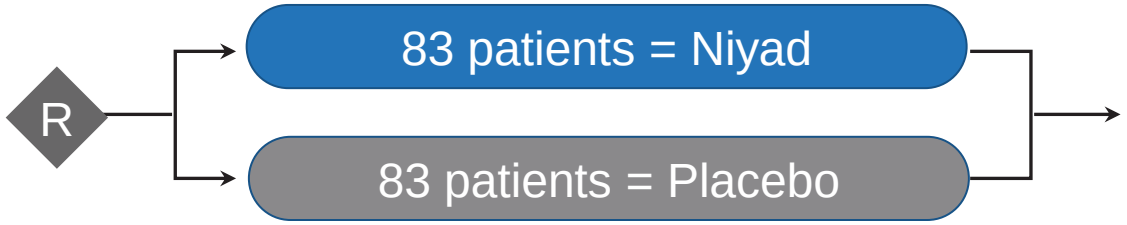
FDA has approved the IDE with a single registrational study being initiated in Q4 2023

Prospective, randomized, placebo-controlled study at up to 10 clinical sites

Randomization

166 adult patients undergoing RRT who cannot tolerate heparin or are at risk for bleeding

Dosing period (7 days)



Safety:

Bleeding, electrolyte disorders, 28-day all-cause mortality

Primary Endpoints:

- mean post-filter activated clotting time (ACT) over first 24 hours versus placebo

Key Secondary Endpoints:

- Filter lifespan
- Number of filter changes over 72 hours
- Number of transfusions over 72 hours
- Dialysis efficacy (based on urea concentration) over first 24 hours

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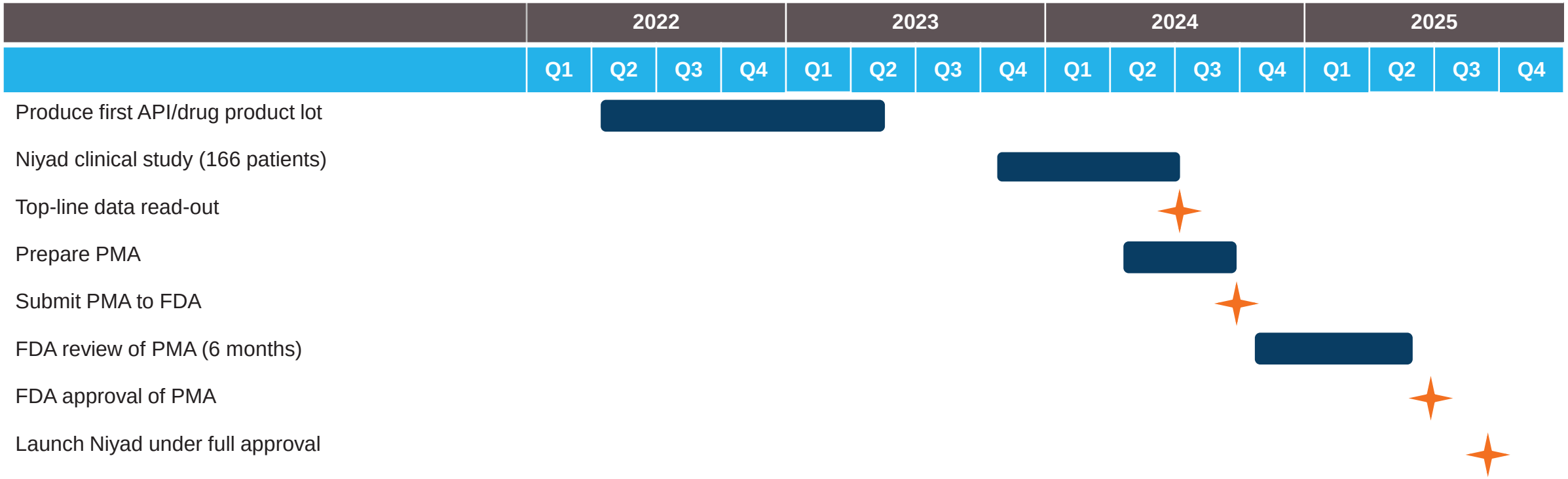
Anticipated timeline to PMA approval for Niyad™

FDA review of IDE is complete with approval for a single study of 166 patients with primary and secondary endpoints established



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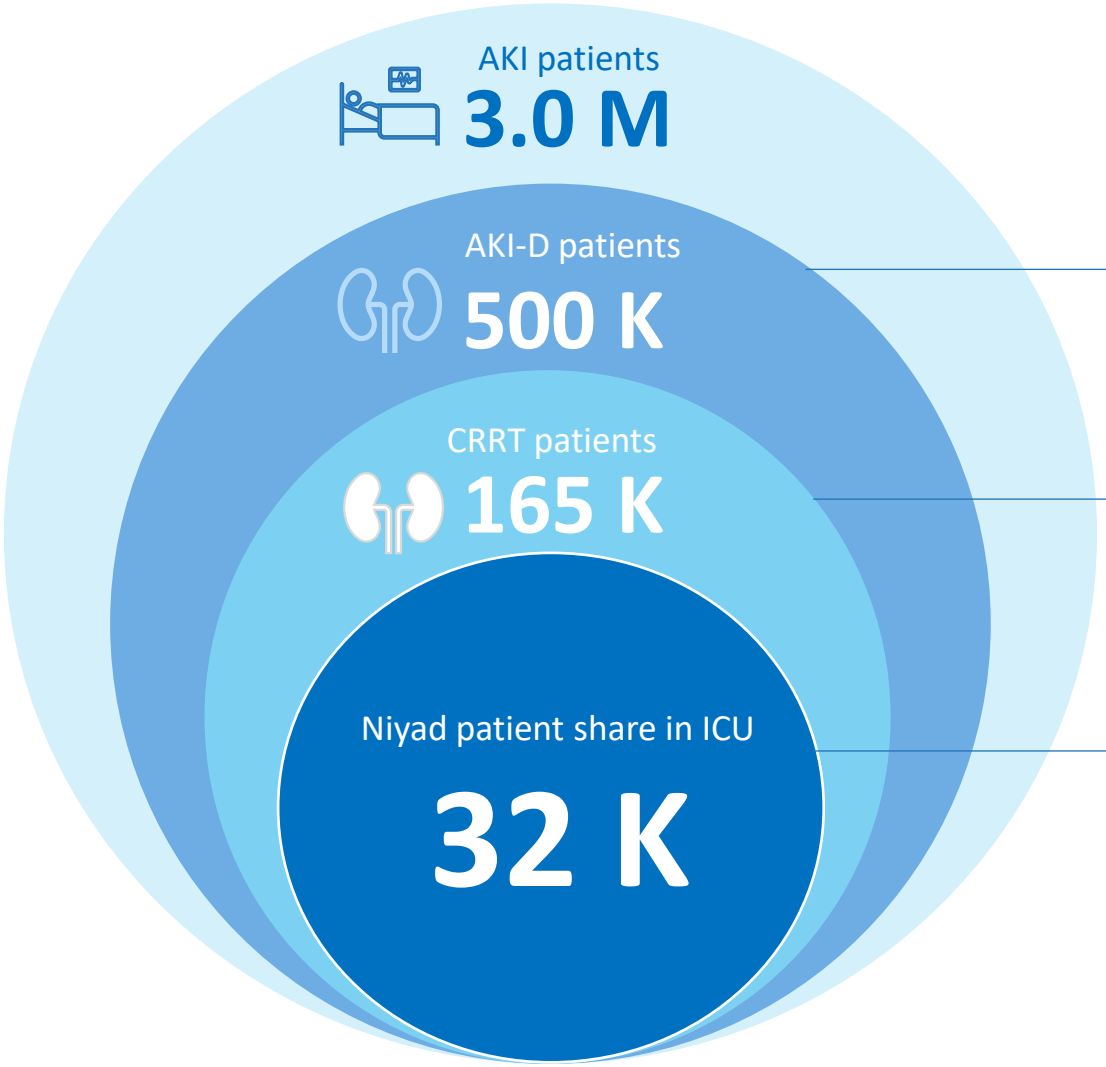
* Pending successful completion of IDE study

Niyad™ market opportunity in CRRT

If approved, Niyad would be the only FDA approved regional anticoagulant for the extracorporeal circuit



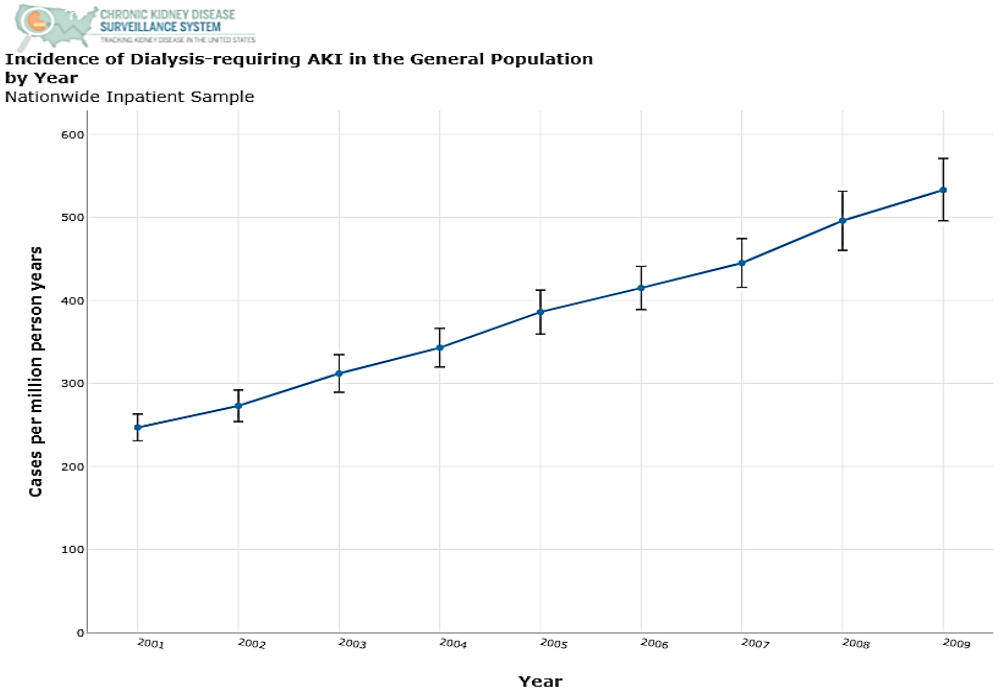
Some patients receive intermittent hemodialysis (IHD) and others continuous (CRRT)

5-7 days average CRRT; then possible transition to IHD

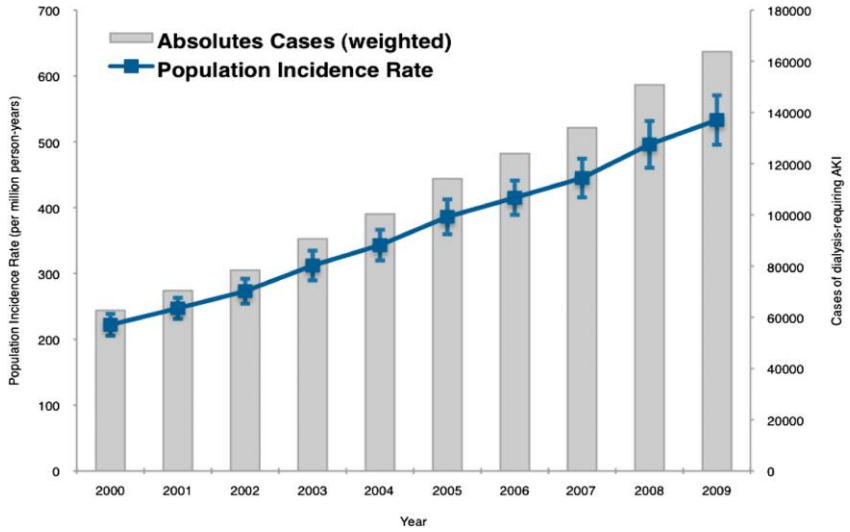
Estimated 19.5% share taken from (a) no anticoagulant used because of safety with current products; (b) some from heparin and (c) some from citrate.

Excludes other in-hospital anticoagulation of extracorporeal circuits (ECMO, CRRT outside of ICU)

Acute kidney injury rates are rapidly increasing



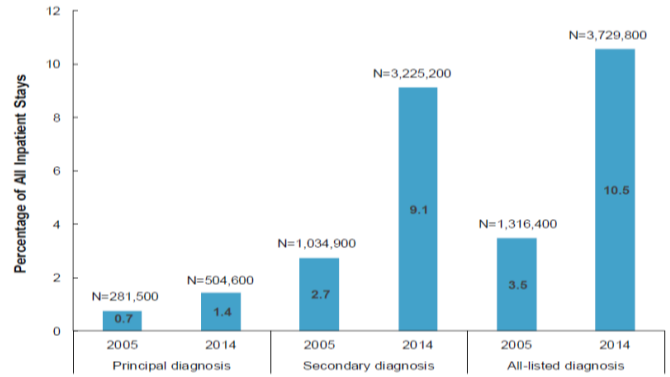
Centers for Disease Control and Prevention. Chronic Kidney Disease Surveillance System—United States. website. https://nccd.cdc.gov/ckd



Hsu RK, McCulloch CE, Dudley RA, Lo LJ, Hsu CY. Temporal changes in incidence of dialysis-requiring AKI. J Am Soc Nephrol. 2013;24(1):37-42.

Acute kidney injury (AKI) is defined by a rapid increase in serum creatinine, decrease in urine output, or both. AKI occurs in approximately 10-15% of patients admitted to hospital, while its incidence in intensive care has been reported in more than 50% of patients.[1]

Figure 1. Number and percentage of inpatient stays with a diagnosis of acute renal failure, 2005 and 2014

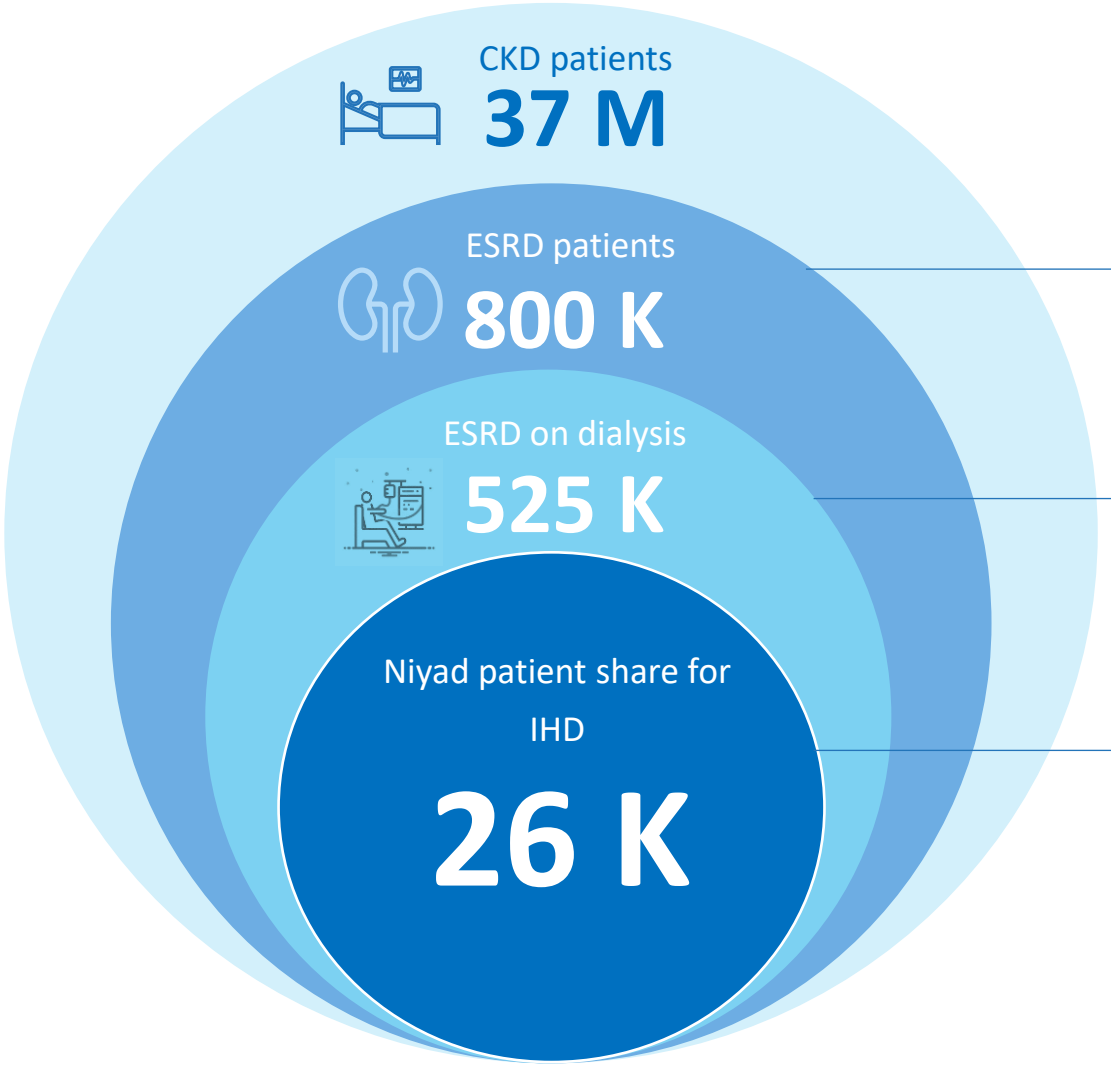


Note: Diagnoses were identified using the Clinical Classifications Software (CCS).
Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), National (Nationwide) Inpatient Sample (NIS), 2005â€“2014

1. Acute kidney injury. Lancet. 2019; 394(10212):1949-1964 (ISSN: 1474-547X), Ronco C; Bellomo R; Kellum JA

Niyad™ market opportunity in IHD

Intermittent hemodialysis is shorter in duration than CRRT, however, frequency of the procedure is 3x per week, year-round

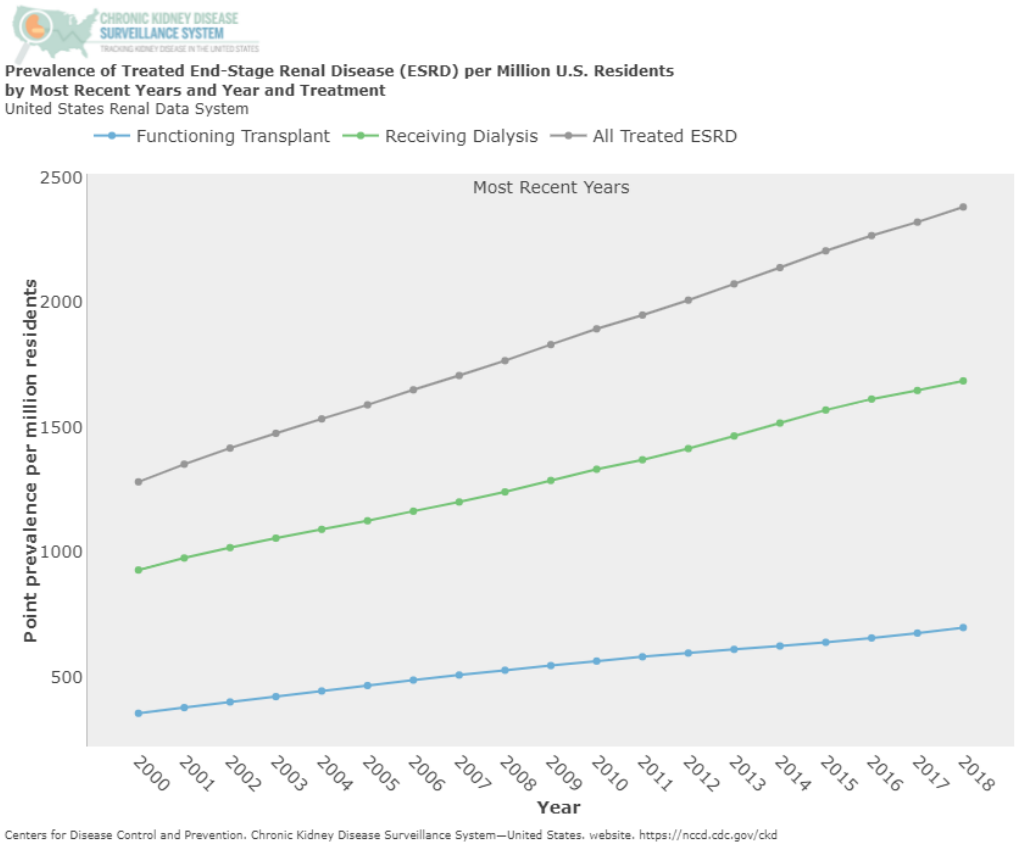


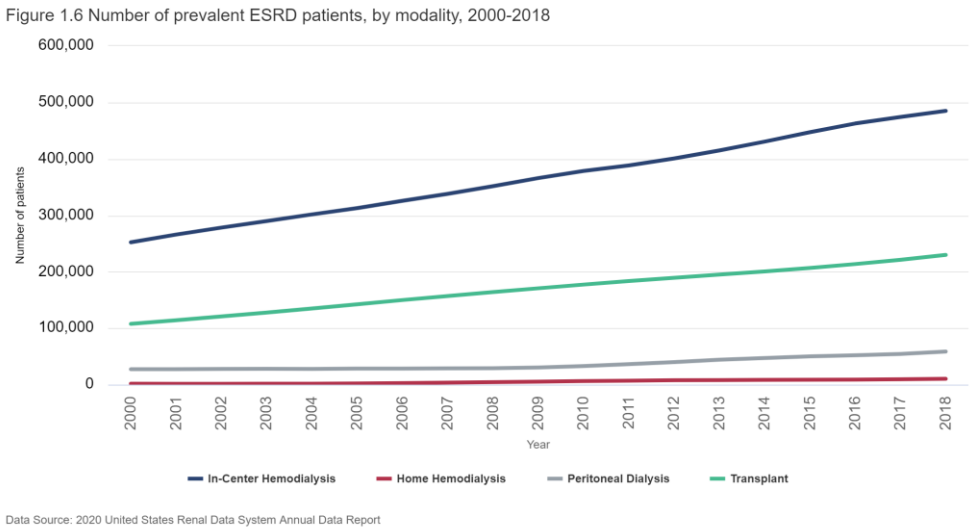
ESRD is the fifth stage of chronic kidney disease (CKD) and requires dialysis

Patients receive dialysis 3x per week

Estimated 6% share due to patients who can't tolerate heparin, but $ opportunity is larger at 3x per week dialysis

End stage renal disease (ESRD) and outpatient dialysis continues to increase





End stage renal disease (ESRD) is the fifth stage of chronic kidney disease (CKD) and requires dialysis or transplant; The prevalence of ESRD has more than tripled since 1990 [1]

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1. Centers for Disease Control and Prevention. Chronic Kidney Disease Surveillance System—United States.website. http://www.cdc.gov/ckd

LTX-608: The other nafamostat opportunity with broad potential

Nafamostat is a "pipeline in a product" that has potential beyond Niyad

Disseminated intravascular coagulation (DIC)	Approved indication in Japan and South Korea; intellectual property protection will focus on method of use patents based on the complexity of DIC treatment
COVID treatment	Various ex-US studies have demonstrated positive results; publications support development as a potential COVID treatment by inhibiting TMPRSS2; A potent broad-spectrum serine protease inhibitor that blocks host protease activation of the viral spike protein [1] Lowell has a published patent regarding nafamostat antiviral for COVID and others
Acute respiratory distress syndrome (ARDS)	A life-threatening lung injury that allows fluid to leak into lungs; Nafamostat potential modes of action of anticoagulation, anti-inflammation and sustaining endothelial barrier function/preventing vascular leak could support exploring development
Acute pancreatitis	Approved indication in Japan and South Korea

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1. B. F. Niemeyer, C. M.Miller, C. Ledesma-Feliciano, J. H. Morrison, R.Jimenez-Valdes,C.Clifton,E.M.Poeschla,K.H.Benam, Nano Select ????,

Nafamostat intellectual property status and data exclusivity

Potential for six years data exclusivity upon Niyad PMA approval before issuance of pending patents

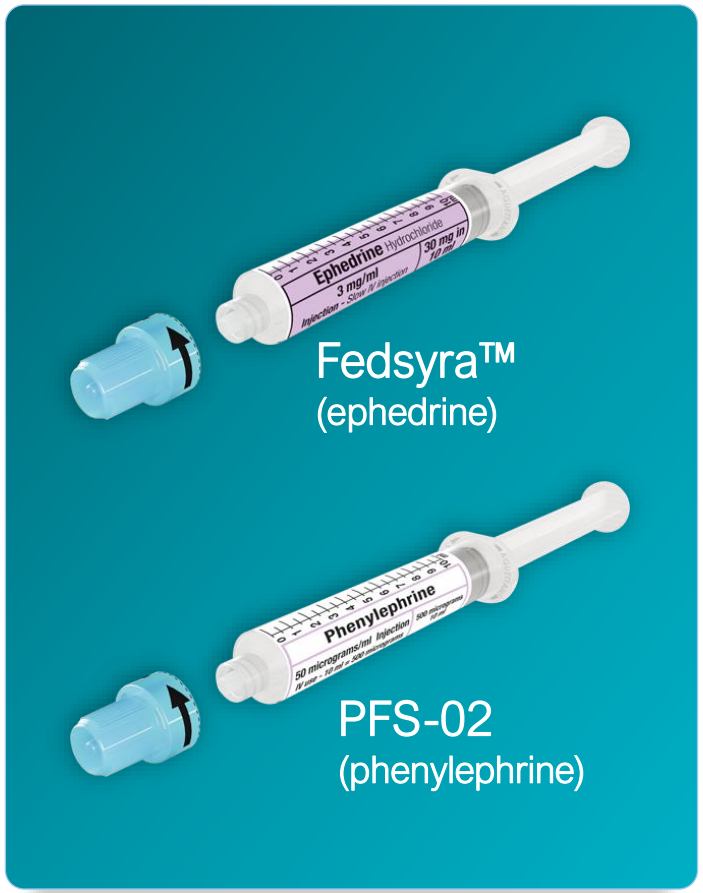
Niyad™ patent pending	LTX-608 (nafamostat) multiple patents pending
Claims drawn to priming of the extracorporeal circuit and blood flow when using nafamostat.	Claims drawn to use of nafamostat in disseminated intravascular coagulation (DIC), as an antiviral agent (e.g., COVID treatment), in acute respiratory distress (ARDS) and other conditions.

Pre-filled syringe portfolio

Fedsyra™ - Ephedrine hydrochloride 10 ml pre-filled syringe
Phenylephrine hydrochloride 10 ml pre-filled syringe

Two complementary pipeline products added in July 2021 through a licensing agreement with France-based pharmaceutical company Laboratoire Aguettant

- Pre-filled, ready-to-use syringes of commonly used products for acute care
- Pre-filled, ready-to-use ephedrine and phenylephrine syringes combined market opportunity is estimated at over $100 million
- Minimal expected cost to get the products through NDA submissions and potential approval
- NDA submission for ephedrine expected in 2023 and phenylephrine expected in 2024
- Approved and marketed products in Europe and other regions outside the U.S.



Ephedrine and phenylephrine: Commonly used medicines in the perioperative settings for hypotension

Ephedrine is a first-line treatment for hypotension under general anesthesia[1]

Ephedrine is an alpha- and beta- adrenergic agonist and a norepinephrine-releasing agent that is indicated for the treatment of clinically important hypotension occurring in the setting of anesthesia

Phenylephrine is a first line treatment for hypotension for obstetrics and spinal anesthesia[2]

Phenylephrine is an alpha-1 adrenergic receptor agonist for the treatment of clinically important hypotension resulting primarily from vasodilation in the setting of anesthesia

Generic concentrate vial

Ready-to-use vial/ampoule

Ready-to-use Syringe *

Evolving to pre-filled syringes

1. Lonjaret et al. Integr Blood Press Control. 2014;7:49-59.
2. Bishop et al. Anesth Analg. 2017;125(3):904-906.

* Not an FDA approved product; Aguettant pre-filled syringe and AcelRx's formulations of ephedrine and phenylephrine are investigational in the U.S.

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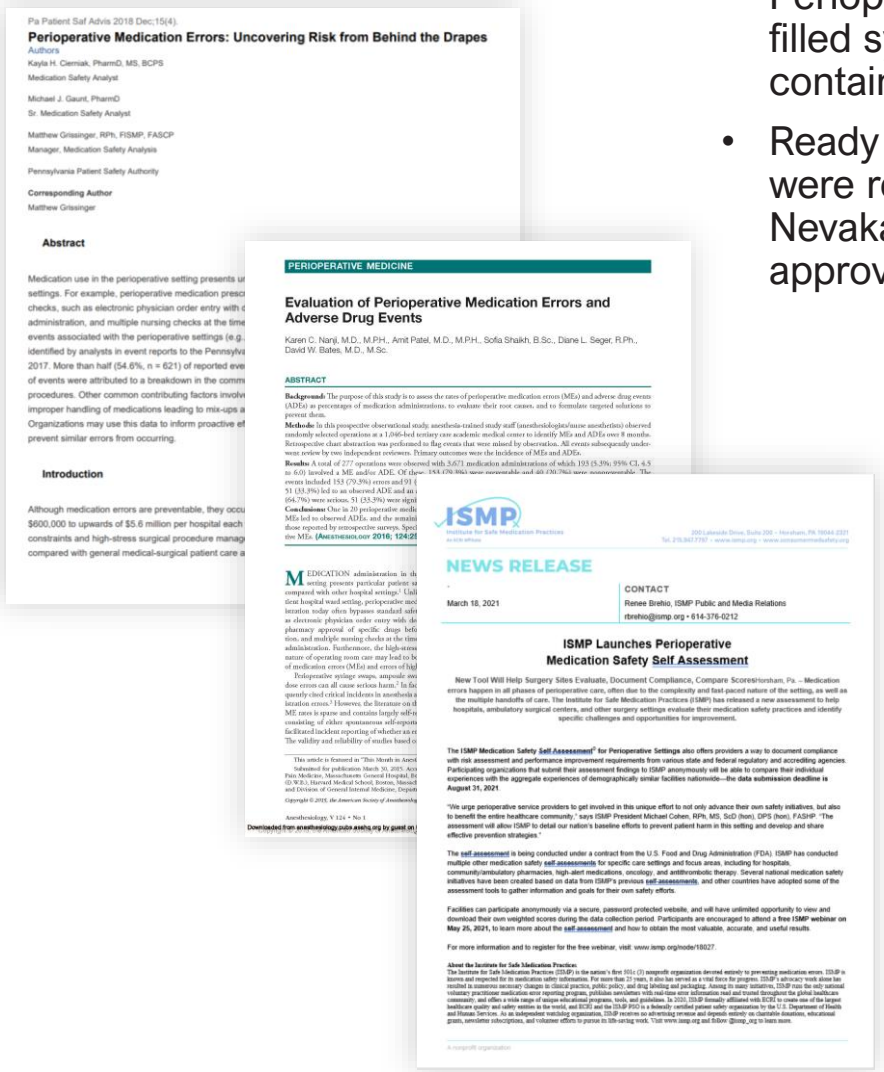
Aguettant pre-filled syringes are focused on delivering commonly used medicines safely and efficiently



Pa Patient Saf Advis 2018 Dec;15(4).

Perioperative Medication Errors: Uncovering Risk from Behind the Drapes

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Abstract

Medication use in the perioperative setting presents u
settings. For example, perioperative medication presc
checks, such as electronic physician order entry with
administration, and multiple nursing checks at the time
events associated with the perioperative settings (e.g.,
identified by analysts in event reports to the Pennsylva
2017. More than half (54.6%, n = 621) of reported eve
of events were attributed to a breakdown in the comm
procedures. Other common contributing factors involv
improper handling of medications leading to mix-ups a
Organizations may use this data to inform proactive ef
prevent similar errors from occurring.

Introduction

Although medication errors are preventable, they occu
$600,000 to upwards of $5.6 million per hospital each
constraints and high-stress surgical procedure manag
compared with general medical-surgical patient care a

PERIOPERATIVE MEDICINE

Evaluation of Perioperative Medication Errors and Adverse Drug Events

Karen C. Nanji, M.D., M.P.H., Amit Patel, M.D., M.P.H., Sofia Shaikh, B.Sc., Diane L. Seger, R.Ph., David W. Bates, M.D., M.Sc.

ABSTRACT

Background: The purpose of this study is to assess the rates of perioperative medication errors (MEs) and adverse drug events (ADEs) as percentages of medication administrations, to evaluate their root causes, and to formulate targeted solutions to prevent them.

Methods: In this prospective observational study, anesthesia-trained study staff (anesthesiologists/nurse anesthetists) observed randomly selected operations at a 1,046-bed tertiary care academic medical center to identify MEs and ADEs over 8 months. Retrospective chart abstraction was performed to flag events that were missed by observation. All events subsequently underwent review by two independent reviewers. Primary outcomes were the incidence of MEs and ADEs.

Results: A total of 277 operations were observed with 3,671 medication administrations of which 193 (5.3%; 95% CI, 4.5 to 6.0) involved a ME and/or ADE. Of these 184 (95.3%) were severable and 40 (20.7%) were nonpreventable. The events included 153 (79.3%) errors and 91 (
51 (33.3%) led to an observed ADE and an
(64.7%) were serious. 51 (33.3%) were sign

Conclusions: One in 20 perioperative medi
MEs led to observed ADEs, and the remain
those reported by retrospective surveys. Spec
the MEs. (ANESTHESIOLOGY 2016; 124:25

MEDICATION administration in th
setting presents particular patient s
compared with other hospital settings.[1] Unli
first hospital ward setting, perioperative med
istration today often bypasses standard safet
as electronic physician order entry with de
pharmacy approval of specific drugs befo
tion, and multiple nursing checks at the time
administration. Furthermore, the high-stress
nature of operating room care may lead to h
of medication errors (MEs) and errors of hig
Perioperative syringe swaps, ampoule ow
dose errors can all cause serious harm.[2] In fa
quently cited critical incidents in anesthesia
istration errors.[3] However, the literature on t
ME rates is sparse and contains largely self-r
consisting of either spontaneous self-reporti
facilitated incident reporting of whether an e
The validity and reliability of studies based o

This article is featured in "This Month in Anest
Submitted for publication March 30, 2015. Acce
Pain Medicine, Massachusetts General Hospital, Bo
(D.W.B.), Harvard Medical School, Boston, Massach
and Division of General Internal Medicine, Depart

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NEWS RELEASE

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ISMP Launches Perioperative Medication Safety Self Assessment

New Tool Will Help Surgery Sites Evaluate, Document Compliance, Compare ScoresHorsham, Pa. – Medication errors happen in all phases of perioperative care, often due to the complexity and fast-paced nature of the setting, as well as the multiple handoffs of care. The Institute for Safe Medication Practices (ISMP) has released a new assessment to help hospitals, ambulatory surgical centers, and other surgery settings evaluate their medication safety practices and identify specific challenges and opportunities for improvement.

The ISMP Medication Safety Self Assessment® for Perioperative Settings also offers providers a way to document compliance with risk assessment and performance improvement requirements from various state and federal regulatory and accrediting agencies. Participating organizations that submit their assessment findings to ISMP anonymously will be able to compare their individual experiences with the aggregate experiences of demographically similar facilities nationwide—the data submission deadline is August 31, 2021.

"We urge perioperative service providers to get involved in this unique effort to not only advance their own safety initiatives, but also to benefit the entire healthcare community," says ISMP President Michael Cohen, RPh, MS, ScD (hon), DPS (hon), FASHP. "The assessment will allow ISMP to detail our nation's baseline efforts to prevent patient harm in this setting and develop and share effective prevention strategies."

The self assessment is being conducted under a contract from the U.S. Food and Drug Administration (FDA). ISMP has conducted multiple other medication safety self-assessments for specific care settings and focus areas, including for hospitals, community/ambulatory pharmacies, high-alert medications, oncology, and antithrombotic therapy. Several national medication safety initiatives have been created based on data from ISMP's previous self-assessments, and other countries have adopted some of the assessment tools to gather information and goals for their own safety efforts.

Facilities can participate anonymously via a secure, password protected website, and will have unlimited opportunity to view and download their own weighted scores during the data collection period. Participants are encouraged to attend a free ISMP webinar on May 25, 2021, to learn more about the self assessment and how to obtain the most valuable, accurate, and useful results.

For more information and to register for the free webinar, visit: www.ismp.org/node/18027.

About the Institute for Safe Medication Practices:
The Institute for Safe Medication Practices (ISMP) is the nation's first 501c (3) nonprofit organization devoted entirely to preventing medication errors. ISMP is known and respected for its medication safety information. For more than 27 years, it also has served as a vital force for progress. ISMP's advocacy work alone has resulted in numerous necessary changes in clinical practice, public policy, and drug labeling and packaging. Among its many initiatives, ISMP runs the only national voluntary practitioner medication error reporting program, publishes newsletters with real-time error information read and trusted throughout the global healthcare community, and offers a wide range of unique educational programs, tools, and guidelines. In 2020, ISMP formally affiliated with ECRI to create one of the largest healthcare quality and safety entities in the world, and ECRI and the ISMP-PSO is a federally certified patient safety organization by the U.S. Department of Health and Human Services. As an independent watchdog organization, ISMP receives no advertising revenue and depends entirely on charitable donations, educational grant, newsletter subscriptions, and volunteer efforts to pursue its life-saving work. Visit www.ismp.org and follow @ismp_org to learn more.

A nonprofit organization

- Perioperative medication errors continue, and pre-filled syringes are preferred for improving safety while containing costs
- Ready to use vials of ephedrine and phenylephrine were recently approved: Emerphed (in 2020), Eton, Nevakar; Pre-filled ephedrine syringes were recently approved (in 2022 and 2023): Akovaz, Emerphed

Outpatient Surgery Magazine | Empowering Excelle in Ambulatory Surgery
A Division of AORN

Prefilled Syringes Are the Preferred Choice

Waste reduction, time-savings and increased safety are among the benefits of purchasing preloaded medications.

Sheldon Sones

Publish Date: April 8, 2021 | Tags: Supply Management (/outpatient-surgery/search#sort=date%20descending&f:@osmtopicfacet=[Supply Management])

QUICK DRAW Prefilled syringes allow you to bypass the time-consuming task of drawing up medications and complying with safe labeling practices. | *Pamela Bevelhymer*

AcelRx Pharmaceuticals, Inc.

DSUVIA was divested to Alora Pharmaceuticals in April 2023 with long-term value creation expected from royalties and milestones

DSUVIA®
(sufentanil)
sublingual tablet 30 mcg C II

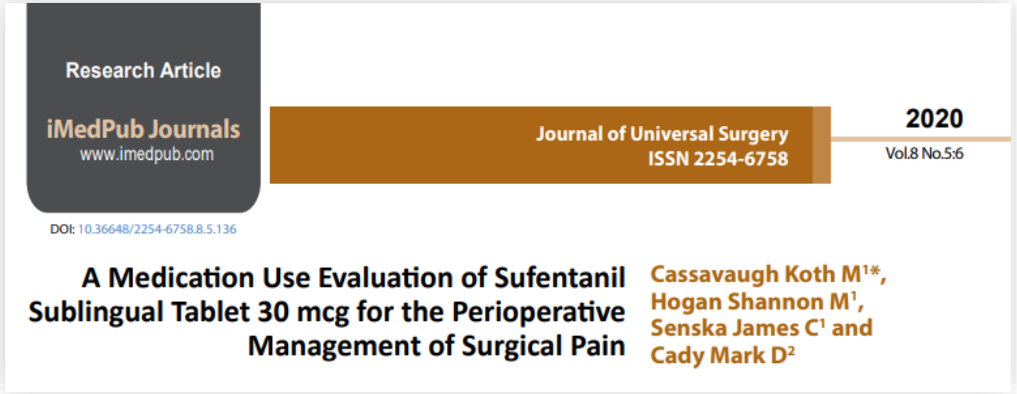
The Department of Defense provided $22M to develop DSUVIA and approved DSUVIA for all Army SKO's

- The DoD provided $22M in funding for the development of DSUVIA as the next battlefield analgesic
- The US Army approved DSUVIA for inclusion in all troop's sets, kits and outfits (SKO's), with initial stocking estimated to generated $30M in revenues over 3 years
- Joint Deployment Formulary approval received in September 2020
- US Army study at UPMC expected to be completed in January 2024

AcelRx Pharmaceuticals, Inc.

DSUVIA enables opioid stewardship and potentially reduces patient time in the PACU

- Multiple recent studies demonstrating significantly lower amounts of perioperative opioids administered, and reduced patient time in the PACU when DSUVIA was used for analgesia
- When administering DSUVIA there was an overall greater than 50% reduction in opioid equivalents administered, with an 80% reduction in opioids administered post-op in the institution versus the control group.



Research Article

iMedPub Journals
www.imedpub.com

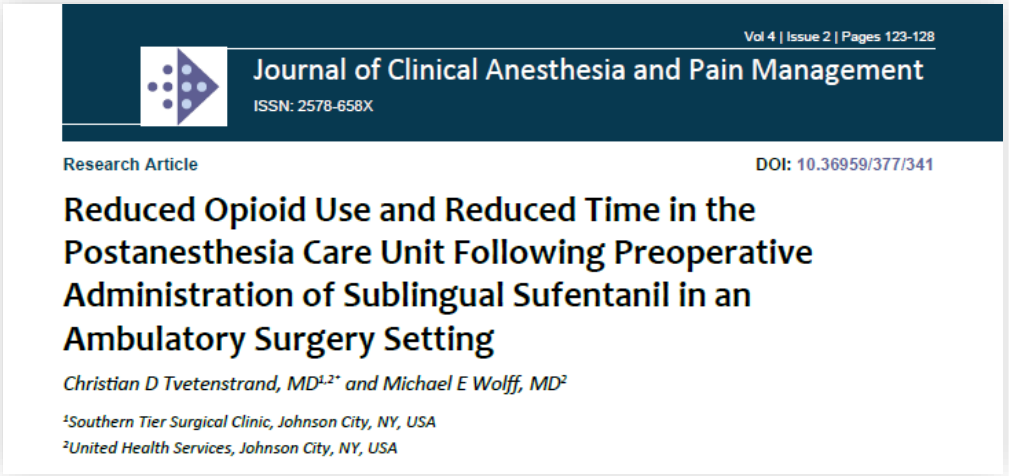
Journal of Universal Surgery
ISSN 2254-6758

2020
Vol.8 No.5:6

DOI: 10.36648/2254-6758.8.5.136

A Medication Use Evaluation of Sufentanil Sublingual Tablet 30 mcg for the Perioperative Management of Surgical Pain

Cassavaugh Koth M[1]*, Hogan Shannon M[1], Senska James C[1] and Cady Mark D[2]



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Journal of Clinical Anesthesia and Pain Management

ISSN: 2578-658X

Research Article

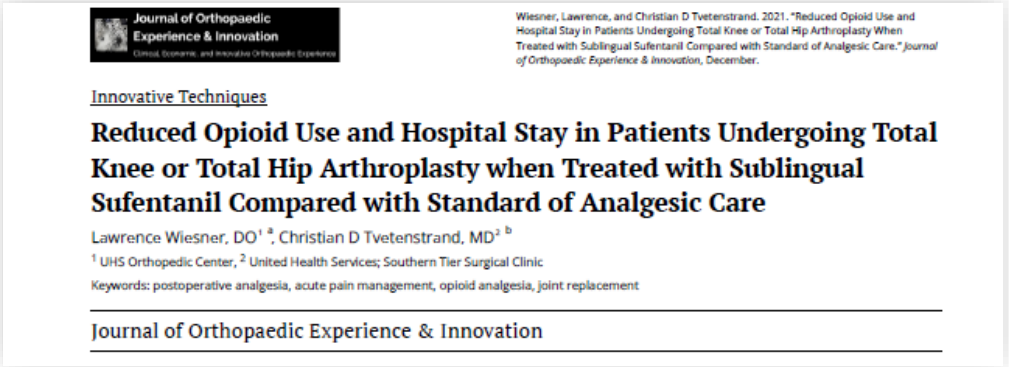
DOI: 10.36959/377/341

Reduced Opioid Use and Reduced Time in the Postanesthesia Care Unit Following Preoperative Administration of Sublingual Sufentanil in an Ambulatory Surgery Setting

Christian D Tvetenstrand, MD[1,2] and Michael E Wolff, MD[2]*

[1]Southern Tier Surgical Clinic, Johnson City, NY, USA

[2]United Health Services, Johnson City, NY, USA



Journal of Orthopaedic Experience & Innovation

Wiesner, Lawrence, and Christian D Tvetenstrand. 2021. "Reduced Opioid Use and Hospital Stay in Patients Undergoing Total Knee or Total Hip Arthroplasty When Treated with Sublingual Sufentanil Compared with Standard of Analgesic Care." *Journal of Orthopaedic Experience & Innovation*, December.

Innovative Techniques

Reduced Opioid Use and Hospital Stay in Patients Undergoing Total Knee or Total Hip Arthroplasty when Treated with Sublingual Sufentanil Compared with Standard of Analgesic Care

Lawrence Wiesner, DO[1 a], Christian D Tvetenstrand, MD[2 b]

[1] UHS Orthopedic Center, [2] United Health Services; Southern Tier Surgical Clinic

Keywords: postoperative analgesia, acute pain management, opioid analgesia, joint replacement

Journal of Orthopaedic Experience & Innovation

AcelRx Pharmaceuticals, Inc.

Q2 2023 financial information/metrics

$0.3M
Q2 2023 revenues

$26.3M
Total gross proceeds potential from July capital raise upon exercise of all warrants

$3.8M
Q2 2023 combined R&D and SG&A(2)

$17.4M
Proforma cash and cash equivalents (1)
(proforma at June 30, 2023)

$ - M
Senior Debt at June 30, 2023

$16-20M
FY 2023 estimated cash operating expense

(1) June 30, 2023 cash balance of $7.4 million plus $10 million of gross proceeds received from the July capital raise
(2) Combined R&D and SG&A excluding $0.5M non-cash stock-based compensation

AcelRx Pharmaceuticals, Inc.

AcelRx Investment Highlights

1. Late-stage pipeline assets with near-term commercial potential in medically supervised settings
2. Lead asset Niyad has FDA Breakthrough Designation with potential peak sales of $200M
3. Single registrational study for Niyad planned to begin enrolling in H2 2023; 160 total patient study, expected 6-9 months timing followed by PMA submission in 2024; we believe high probability of success
4. Fedsyra™, ephedrine pre-filled syringe NDA submission expected in H2 2023
5. Royalty stream from recently divested commercial product DSUVIA - 15% on commercial sales, 75% on DoD sales and up to $116.5M in milestones

Thank You

Nasdaq: ACRX