



Cadrenal Therapeutics, Inc.
NASDAQ: CVKD

September 2024



Caution Concerning Forward-looking Statements

This document contains forward-looking statements. In addition, from time to time, we or our representatives may make forward-looking statements orally or in writing. We base these forward-looking statements on our expectations and projections about future events, which we derive from the information currently available to us. Such forward-looking statements relate to future events or our future performance, including: our financial performance and projections; our growth in revenue and earnings; and our business prospects and opportunities. You can identify forward-looking statements by those that are not historical in nature, particularly those that use terminology such as “may,” “should,” “expects,” “anticipates,” “contemplates,” “estimates,” “believes,” “plans,” “projected,” “predicts,” “potential,” or “hopes” or the negative of these or similar terms.

In evaluating these forward-looking statements, you should consider various factors, including: our ability to successfully develop and commercialize product candidates, our ability to raise capital when needed, and the competitive environment of our business. These and other factors may cause our actual results to differ materially from any forward-looking statement, including those risk factors disclosed in our Annual Report on Form 10-K for the year ended December 31, 2023 filed with the Securities and Exchange Commission on March 11, 2024 and our Quarterly Reports for the quarters ended March 31, 2024 and June 30, 2024. Forward-looking statements are only predictions. The forward-looking events discussed in this document and other statements made from time to time by us or our representatives may not occur, and actual events and results may differ materially and are subject to risks, uncertainties, and assumptions about us. We are not obligated to publicly update or revise any forward-looking statement, whether as a result of uncertainties and assumptions, the forward-looking events discussed in this document, and other statements made from time to time by us or our representatives might not occur.

Cadrenal Therapeutics Overview

Late-stage Biopharma Developing a New Anticoagulant to Improve Care for Underserved Warfarin-dependent Patients

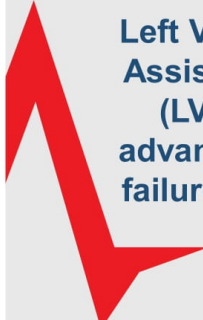
Our Phase 3-ready drug candidate, **tecarfarin**, is a new vitamin K antagonist (VKA) anticoagulant expected to be **superior and safer** than warfarin

Striving to overcome the many challenges of warfarin and result in **improved outcomes** and **fewer major events** such as heart attacks, strokes, bleeds and deaths and lower cost of care by **avoiding costly hospitalizations**




Three Top Potential Indications of Tecarfarin *Two Orphan Drug and One Fast Track Designations*

Focused on patients with implanted cardiac devices or rare cardiovascular (CV) conditions that require chronic anticoagulation



Left Ventricular Assist Devices (LVAD) for advanced heart failure patients



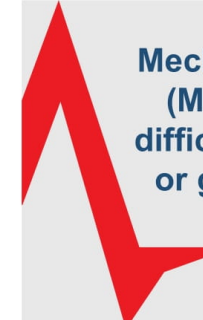
 Orphan Drug Designation (ODD)




End-stage Kidney Disease (ESKD) + Atrial Fibrillation (AFib)



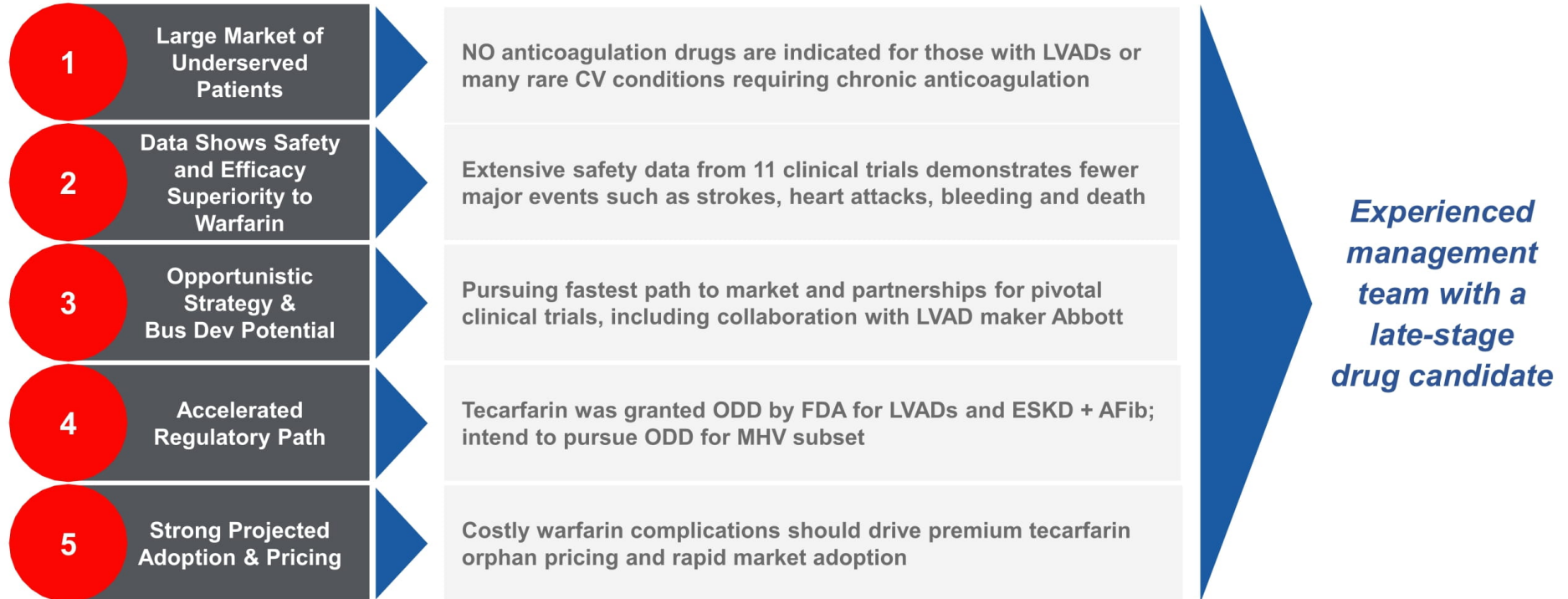
 Orphan Drug Designation + Fast Track



Mechanical Heart Valve (MHV) patients with difficult-to-control TTR* or genetic resistance to warfarin

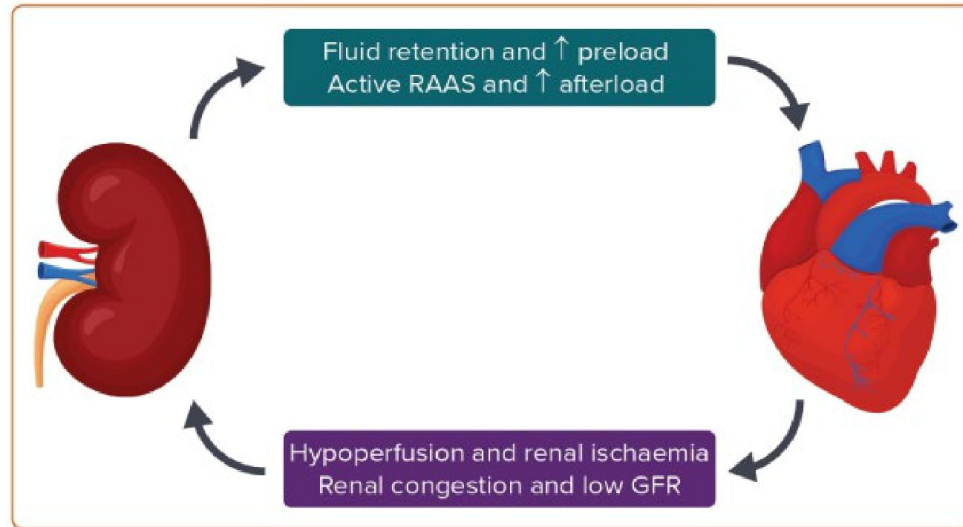


Key Investment Highlights for Cadrenal Opportunity



Gaps in Modern Heart Failure and Chronic Kidney Disease Research

Interdependence of the Heart and Kidney in Chronic Kidney Disease (CKD) and Heart Failure (HF)



GFR = glomerular filtration rate; RAAS = renin-angiotensin-aldosterone system.

49% of HF patients also have CKD, and an estimated 17–21% of CKD patients develop de novo HF¹

Tecarfarin Clinical Development Pipeline

Potential 2024 catalysts for future milestones to build enterprise value

Program	Prioritized Target Indications	Regulatory Strategy/Status	Development Phase				
			Discovery	Preclinical	Phase I	Phase II	Phase III
Tecarfarin	Left Ventricular Assist Devices (LVADs)	<ul style="list-style-type: none"> FDA Orphan Drug Designation Granted Finalizing Trial Protocol Developing EMA Orphan Drug Application 	[Progress bar]				★
	End-stage Kidney Disease with AFib	<ul style="list-style-type: none"> FDA Orphan Drug Designation Granted FDA Fast Track Designation Granted Developing EMA Orphan Drug Application 	[Progress bar]				★
	Mechanical Heart Valve (MHV) patients with difficult-to-control TTR or genetic resistance to warfarin	<ul style="list-style-type: none"> Developing FDA and EMA Orphan Drug Applications 	[Progress bar]				★

Future milestones may include Ph 3 trial enrollment, anticipated data readouts and progress with strategic partnerships

A Review of Tecarfarin

Tecarfarin is the **ONLY** anticoagulant in development for patients with LVADs

HOW TECARFARIN COMPARES

- ➡ Tecarfarin is metabolized via a different pathway than warfarin, thus its efficacy is not affected by drug-drug interactions or kidney impairment, which are common in these patients
- ➡ Based on data from Phase 2/3 trials, tecarfarin performed better than warfarin and provided more stable anticoagulation with a higher TTR, fewer major events
- ➡ Extensive safety data (n=1000)
- ➡ Potential solution for patients with genetic variants, estimated at 18 percent of all CV patients*
- ➡ Direct Oral Anticoagulants (DOACs) such as Eliquis not indicated for LVADs and many rare CV conditions, provide little or negative data with these patients
- ➡ Being championed by LVAD and ESKD KOLs and clinicians



*Source: <https://www.nature.com/articles/jhg201073>



The Problem: Patients with Implanted Cardiac Devices and Rare CV Conditions Lack Effective Anticoagulation

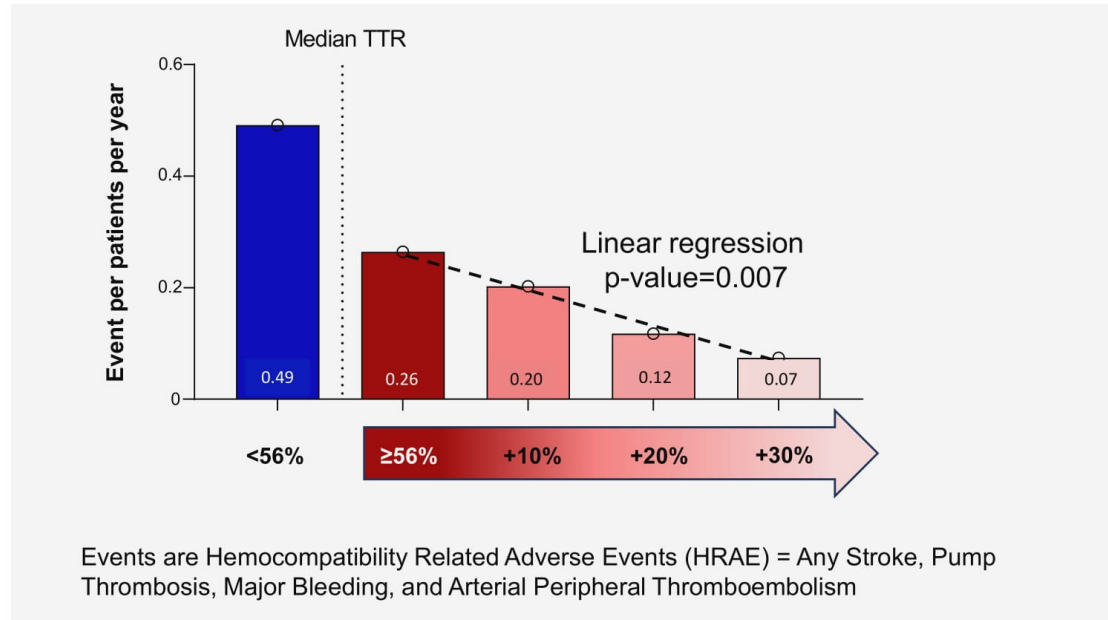
Both warfarin and DOACs are not FDA-approved for patients with LVADs or many rare CV conditions

SIGNIFICANT ISSUES WITH ONLY CHOICES FOR THESE PATIENTS

	Warfarin	DOACs (Pradaxa, Xarelto, Eliquis & Savaysa)
<p>LVAD</p> 	<ul style="list-style-type: none"> High frequency of bleeding events, with LVAD patients being hospitalized more than twice on average within six months of implant* Unstable metabolism due to drug-drug interactions, genetic variability of pathway Late-stage heart failure and kidney dysfunction are often seen in conjunction. Chronic kidney disease (CKD) inhibits the metabolism of warfarin. 	<ul style="list-style-type: none"> Cost and time of reversal compared to VKA is not acceptable for patients at high risk of bleeding or intervention LVAD patients were excluded from all approval studies, leaving void or negative data from earlier clinical trials DOACs not approved for or in guidelines for LVAD patients <p><small>*Source: Annals of Trans Medicine Antiplaetlet and anticoagulation strategies for left ventricular assist devices - PubMed (nih.gov)</small></p>
<p>ESKD+AFib</p> 	<ul style="list-style-type: none"> Higher risk of bleeding in dialysis patients with AFib compared to DOACs Multiple dose adjustments to keep patients within International Normalized Ratio (INR) range Drug interaction in patients with multiple comorbidities 	<ul style="list-style-type: none"> Limited head-to-head evidence; existing data fails to demonstrate benefit in thromboembolism and reveals stroke risk Not approved or included in ESKD treatment guidelines Ambiguity in dosing recommendations

ARIES-HM3 Study (Sponsored by Abbott) Documents the Impact of Poor Anticoagulation Quality of Adverse Events in LVAD patients

- Rate of severe bleeding significantly increased when TTR falls below 56%
- Mean TTR in LVAD patients treated with warfarin is <50% (Martinez et al 2018)



Bleeding Rate in LVAD Patients is a Major Problem

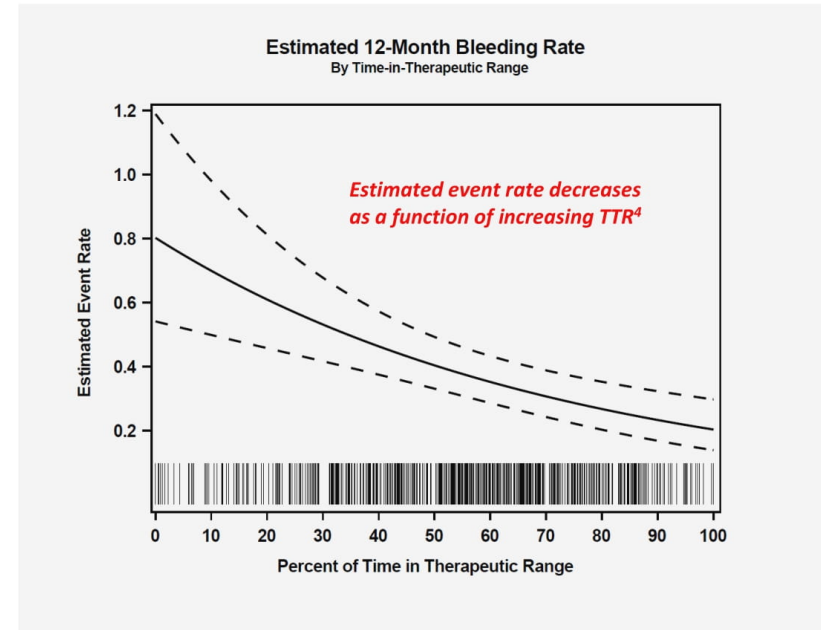
Poor quality anticoagulation, manifest as sub-target TTR, is the cause

Recent clinical evidence from the ARIES-HM3 (Abbott) study documents the consequences of suboptimal anticoagulation with warfarin in LVAD patients

- **Time in Therapeutic Range (TTR)^{1,2}**
 - Well-established marker used to evaluate anticoagulation quality (safety and efficacy)
 - Higher TTR levels correlate directly with improved clinical outcomes including rates of death, bleeding, myocardial infarction, stroke, and systemic embolism
- **TTR predictive of clinical outcomes**
 - Quality of VKA management as measured by TTR correlates strongly with the occurrence of non-surgical bleeding risk in patients with the HM3 LVAD³
 - TTR measurements correlate linearly with bleeding risk (Linear regression p-value=0.007)³

1) White et al. 2007; 2) Currie et al. 2006; 3) Jones et al. 2005

2) TTR quantifies the percentage of time a patient is at the desired level of anticoagulation



3) Mehra et al; Impact Of Vitamin K Antagonist Therapy On Outcomes In a Randomized Controlled Trial of Aspirin Removal In Left Ventricular Assist Device Patients - A Pre-specified Analysis From the ARIES-HM3 Trial; Presented April 2024 at the ISHLT Annual Meeting

Phase 2/3 Trial Shows Tecarfarin results in improved TTR, with Fewer Thrombotic and Hemorrhagic Events¹

Tecarfarin had fewer thrombotic events compared to warfarin

Randomized, double-blind clinical trial



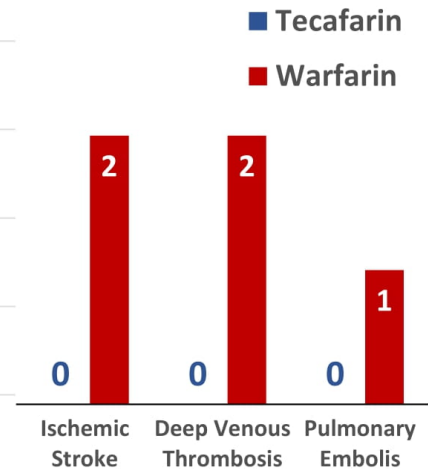
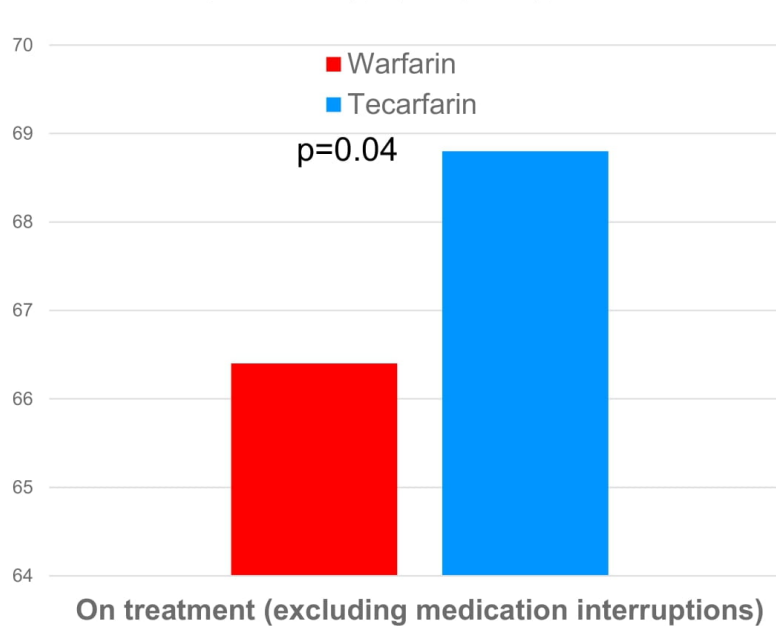
N=607

Patients with indications for chronic anticoagulation

Tecarfarin (n = 304)

Warfarin (n = 303)

Time in Therapeutic Range (TTR) using Observed Values

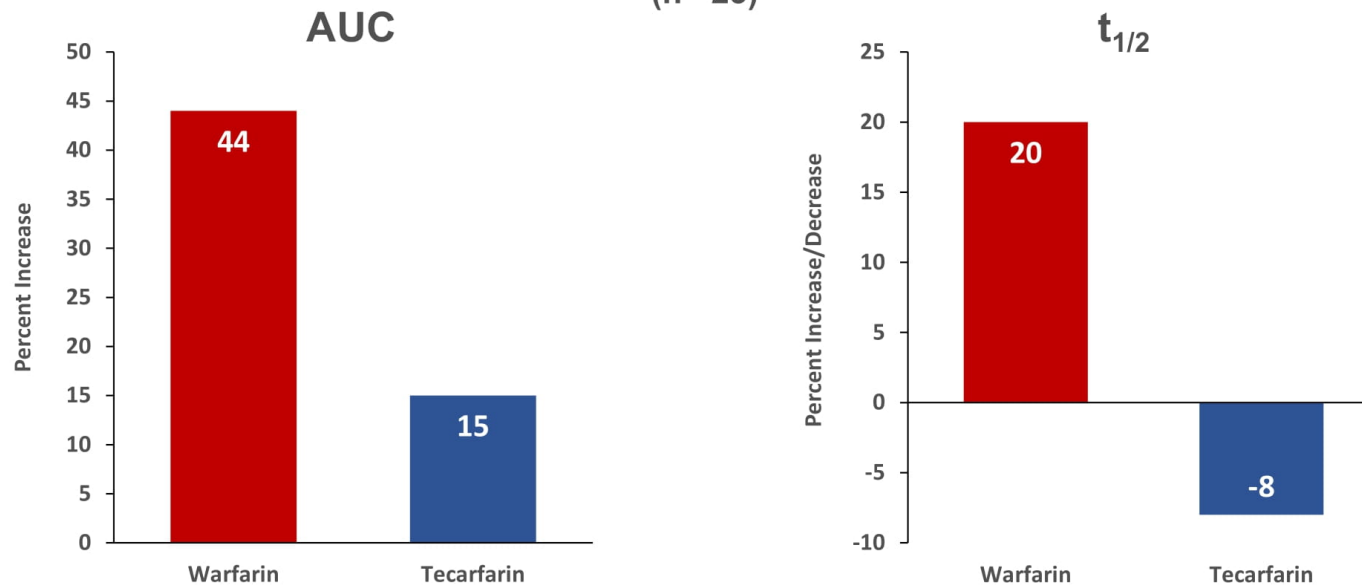


Tecarfarin-treated subjects experienced numerically fewer major hemorrhages than the warfarin-treated patients and had numerically fewer thrombotic events

Tecarfarin Phase 1 PK Trial in Stage 4 CKD Patients Provides Evidence that CKD Does Not Alter Tecarfarin Exposure While Warfarin Exposure is Increased

Tecarfarin metabolism not as impacted by kidney failure

Percent Increase in Exposure for Chronic Kidney Disease Subjects vs Healthy subjects for Warfarin and Tecarfarin (n =23)



The Solution: Tecarfarin Aims to Solve Warfarin's Major Problems and Be the Superior, Safer Choice



Warfarin: High risk for bleeding and other major events

Significant variability with frequent dosing adjustments

MAJOR PROBLEM

for implanted CV devices or rare CV patients

Challenging to control

Drug-drug interactions

Variable PK profile due to genetic variants and interference from other drugs



SOLUTION: Tecarfarin

designed to solve warfarin challenges
DECREASING MAJOR EVENTS SUCH AS STROKE & BLEEDING

Metabolized via an alternate pathway to avoid effects of common drug interactions

Reliable, stable PK profile. **Tecarfarin is not impacted by kidney impairment.**



STABLE ANTICOAGULATION
with longer TTR

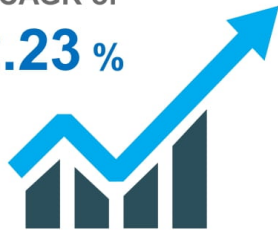
and extensive safety data

LVADs are a Double-digit Growth Market



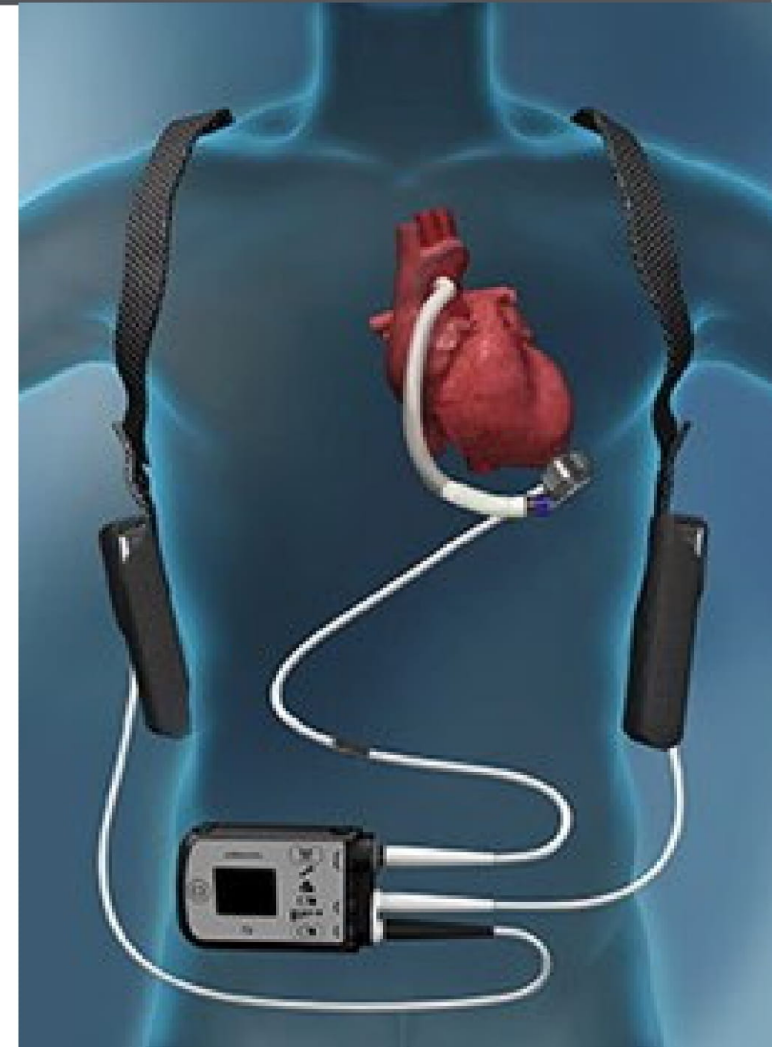
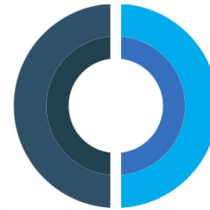
LVAD Market by Application and Geography –
Forecast and Analysis 2021-2025

Market growth will
ACCELERATE
at a CAGR of
12.23 %



46%

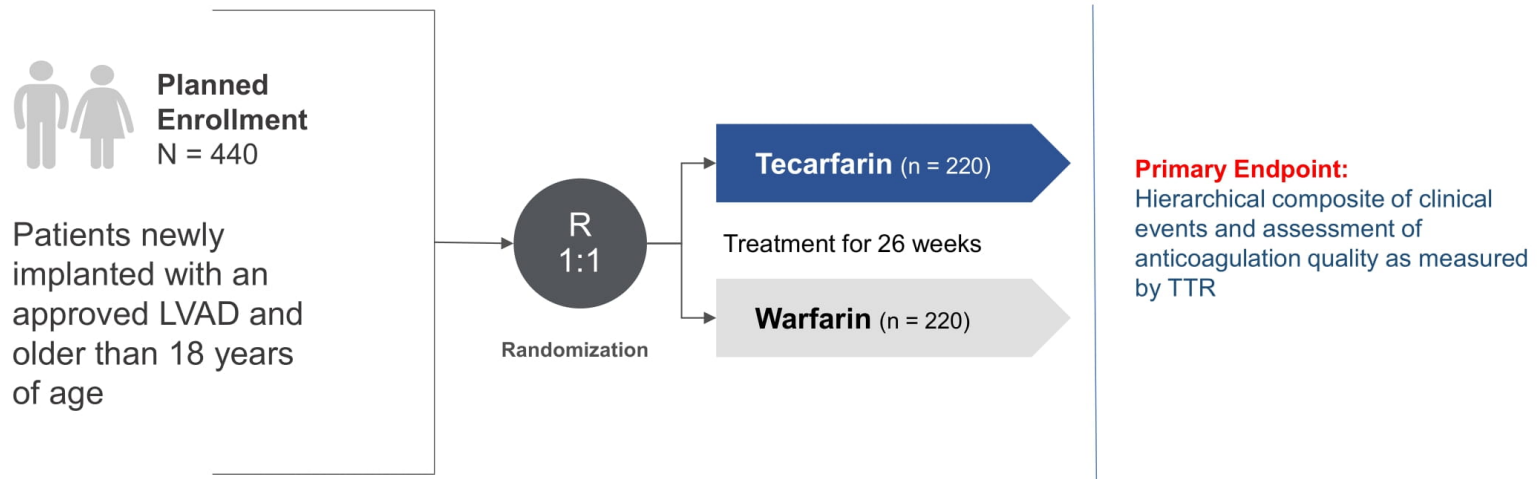
of the growth will
originate from
North America



Proposed Tecarfarin Pivotal Trial Design for LVAD Patients

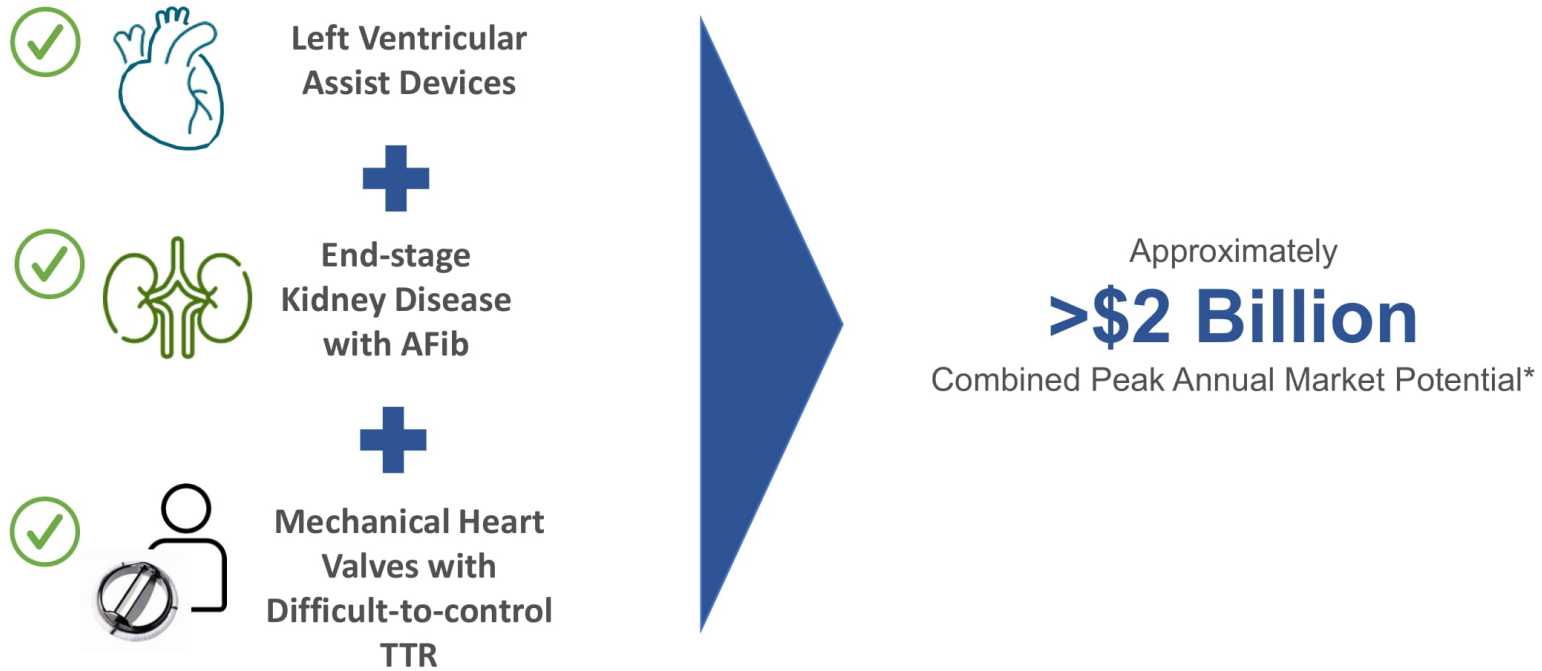
Tecarfarin Anticoagulation and Hemocompatibility in LVAD Patients

A randomized, blinded, phase 3, multicenter study to evaluate the efficacy and safety of tecarfarin compared to warfarin in patients with an approved left-ventricular assist device (LVAD)



Attractive Addressable Market Opportunities

US market potential estimated @ \$2 billion+ for three targeted implanted CV device and rare CV conditions



Financial Summary

Cap Table (reflects August '24 reverse split)

Cash (at 6/30/2024)	\$5.0 million
Debt	NONE
Common Shares Outstanding	1,182,225
Warrants – Investors (avg. \$26.25)	285,714
Warrants - Underwriter & Place Agt. Warrants (avg. \$40.20)	25,938
Stock Options Outstanding (avg. \$13.20)	156,333

2024 Financial Results – 6 Months ended June 30th

Operating Expenses (excluding non-cash items)	\$3.9 million
Cash used in operating activities	\$3.4 million

Market Capitalization

As of 9/24/24	\$14 million
---------------	--------------

Insider Ownership (Common Stock)

Insider Ownership as Percent of Shares Outstanding	42%
--	-----

Leadership Team: Clinical to Commercial Expertise



Quang Pham
CEO & Founder, Chairman



Douglas Losordo, MD
Chief Medical Officer



Matthew Szot, CPA
Chief Financial Officer



Jeff Cole
Chief Operating Officer



John R. Murphy
Board Member



Steven Zelenkofske, DO
Board Member



Glynn Wilson, PhD
Board Member



Robert Lisicki
Board Member



Scientific Advisors with Deep Experience in CV and Beyond



**Mandeep Mehra MD, MSc,
FRCP**

Medical Director of the
Brigham Heart and Vascular Center,
William Harvey Distinguished Chair in
Advanced Cardiovascular Medicine



Richard Whitlock, MD

Cardiac Surgeon and Professor of Surgery,
McMaster
University Medical Center Investigator,
Population Health Research Institute



Michael Lincoff, MD

Vice Chairman, Dept. of Cardiovascular Medicine,
Cleveland Clinic
Director of Clinical Research,
Lerner Research Institute



Elaine M. Hylek, MD, MPH

Professor of Medicine,
Boston University School of Medicine
Director of the Thrombosis and Anticoagulation
Service at **Boston Medical Center (BMC)**



Wolfgang C. Winkelmayr, MD, MPH

Chief, Section of Nephrology,
Professor of Medicine,
Baylor University
Director,
Selzman Institute for Kidney Health



C. Michael Gibson, MD

Professor of Medicine,
Harvard Medical School
Interventional Cardiologist,
Beth Israel Deaconess Medical Center
President & CEO,
Baim Institute for Clinical Research



Christopher Granger, MD

Professor of Medicine in the Division of Cardiology,
Duke University
Member, Duke Clinical Research Institute (DCRI)



Sean Pokorney, MD, MBA

Electrophysiologist and Assistant
Professor of Medicine,
Duke University

Why Cadrenal Now?

CLEAR FROM RECENT DATA that tecarfarin has attractive, defined opportunity in patients where warfarin CHALLENGES ARE HUGE BURDEN and DOACs, with little or negative relevant data, are not the solution



The image displays five blue banners, each with a white icon and a green checkmark in a circle. The banners are arranged horizontally and contain the following text:

- Phase 3-ready Candidate**
Tecarfarin is advancing toward pivotal trials in patients with implanted CV devices or rare CV conditions. KOLs express need and support for a new VKA that is superior, safer and saves the healthcare system hospitalization costs.
- Data Shows Superior Efficacy and Safety**
Phase 1 and 2/3 clinical data shows that tecarfarin is an effective, stable and safe anticoagulant and expected to be superior to warfarin in these underserved patients.
- Bus Dev Progress and Opportunistic Approach**
Pursuing business development strategies to help fund pivotal clinical trials; Multiple potential indications provides optionality.
- Orphan Regulatory Pathway**
Tecarfarin has been granted two Orphan Drug Designations and a Fast-track designation by FDA providing potential seven-year marketing exclusivity post-approval.
- Attractive Market with Orphan Drug Pricing**
Drugs for rare CV conditions that save money and lives command price premiums that value the tecarfarin addressable market @ \$2B+; Experienced team to deliver results.



Contact Us



Quang Pham
CEO & Founder
quang.pham@cadrenal.com

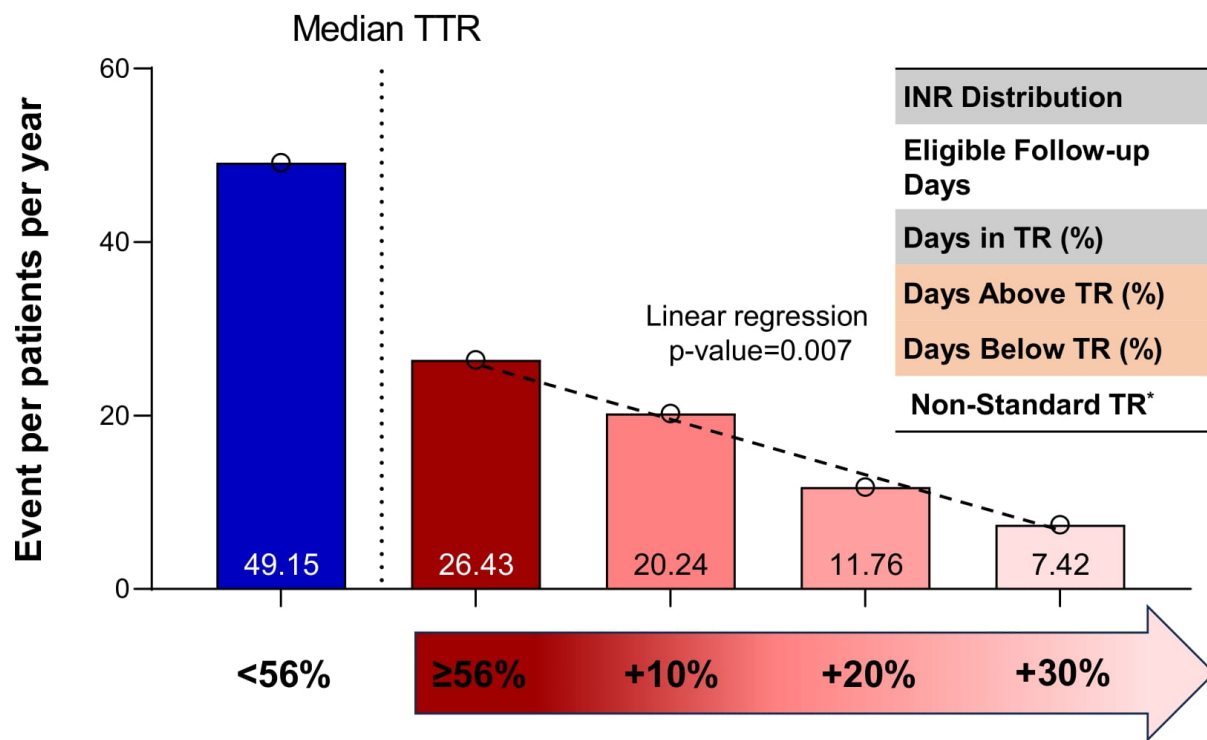
Matthew Szot
CFO
matthew.szot@cadrenal.com

APPENDIX



Bleeding Rate by TTR Increments

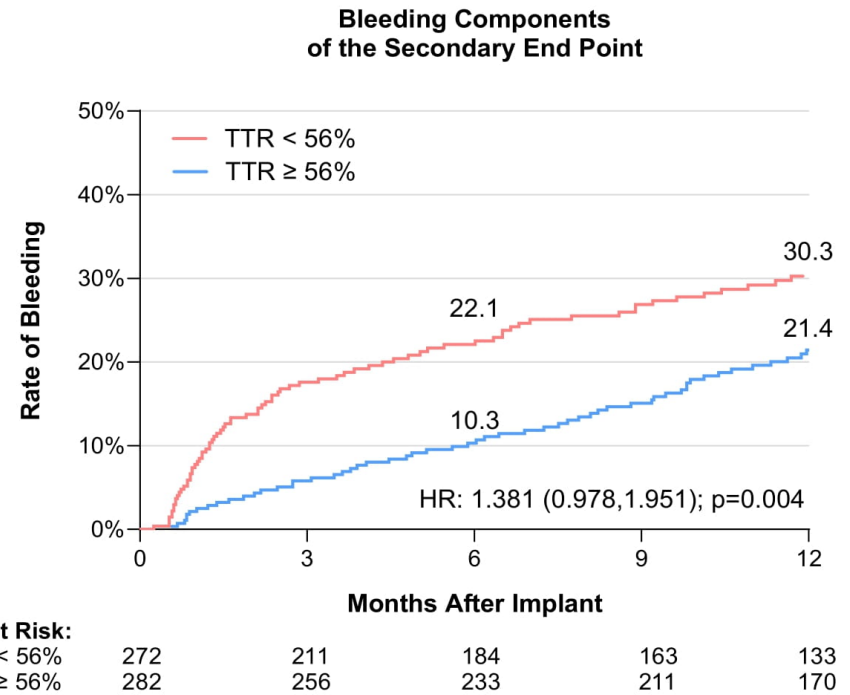
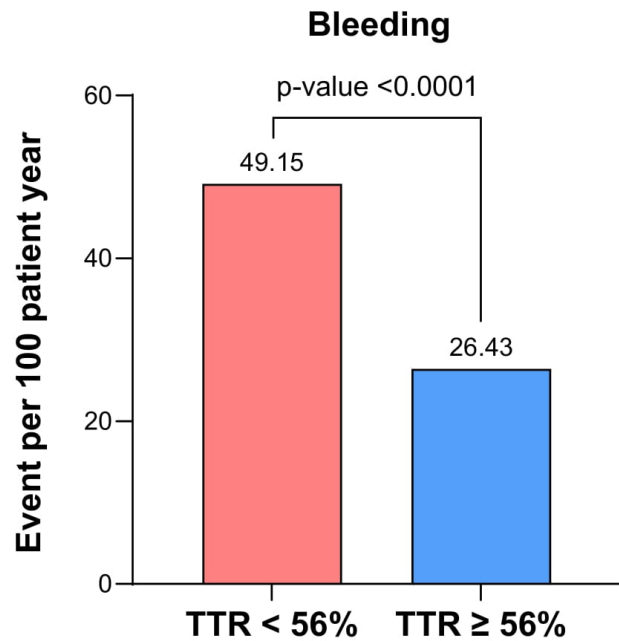
Incremental improvement of 10% above the median of 56% trends in a significant reduction in bleeding rate



	Placebo Median (Q1, Q3)	Aspirin Median (Q1, Q3)	P-value
INR Distribution	2.3 (2.1, 2.4)	2.3 (2.0, 2.5)	0.8227
Eligible Follow-up Days	344.0 (247.0, 364.0)	336.0 (213.0, 365.0)	0.4620
Days in TR (%)	55.8 (41.2, 73.9)	57.3 (38.3, 68.0)	0.4127
Days Above TR (%)	8.4 (0.8, 17.4)	9.5 (2.2, 19.3)	0.2206
Days Below TR (%)	26.2 (13.2, 44.5)	27.4 (14.4, 47.6)	0.3653
Non-Standard TR*	14.4% (40/277)	16.6% (46/277)	0.5576

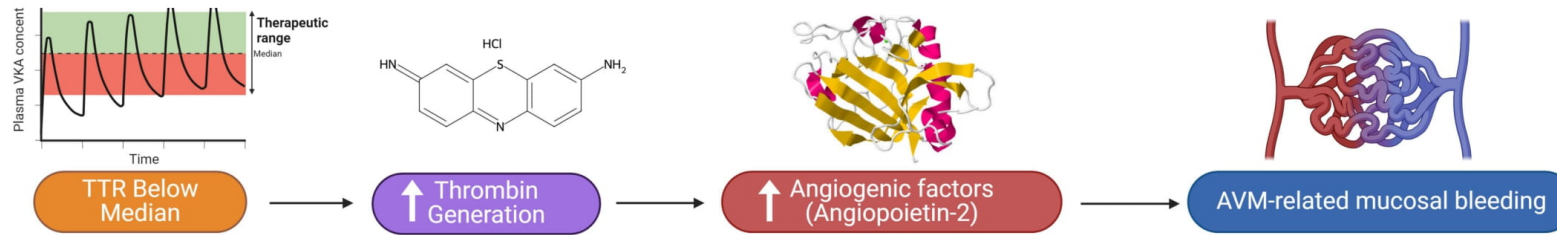
*TR=Therapeutic Range (INR from 2 to 3)

The Impact of TTR on Bleeding in ARIES-HM3



Strategies to Mitigate Bleeding Complications with HM3 LVAD


A Bleeding Paradox?



Residual Bleeding Risk

- 30% at 2-years even after Aspirin elimination
- Related closely to a lower TTR for VKA

POTENTIAL MITIGATION STRATEGIES

- Improve TTR**
 - Resource-intensive VKA management
 - Novel VKA without interactions (Tecarfarin) 
- Switch VKA to DOAC**
 - Requires conclusive safety studies
 - Concern with bridge to heart transplant
- Lower Target INR with VKA**
 - Requires conclusive studies
 - Practically limited
 - Uncertain effect on thrombin

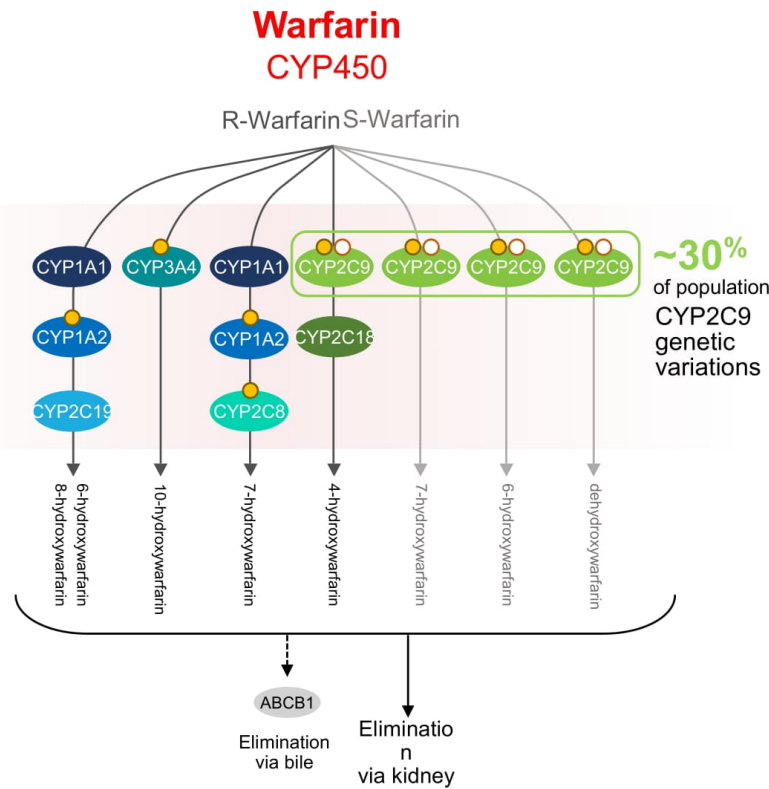
VKA, Vitamin K Antagonist; HM 3, HeartMate 3; DOAC, Direct Oral Anticoagulant; INR, International Normalized Ratio; TTR, Time in Therapeutic Range; AVM, Arteriovenous Malformation.

Tecarfarin's Metabolic Advantage

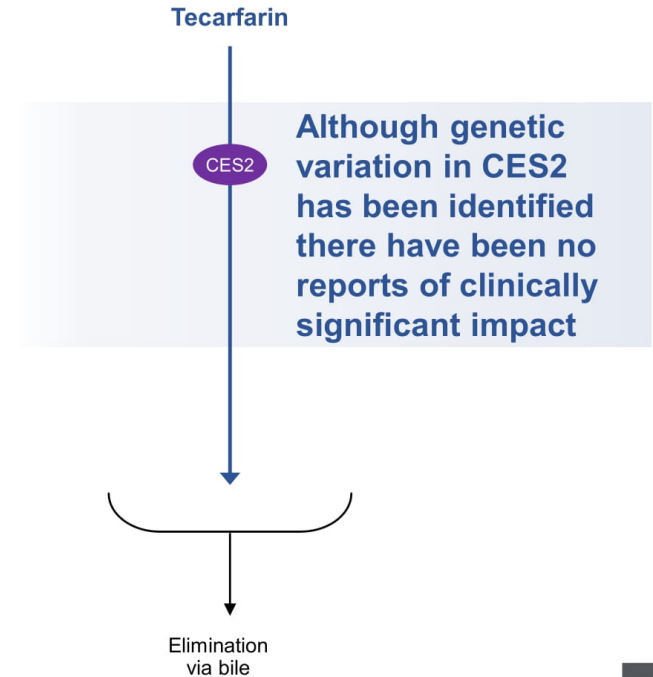
Tecarfarin is metabolized via an alternate pathway that is abundant and essentially insaturable, thereby avoiding the bottleneck in the CYP450 pathway where warfarin is metabolized.

- Drug interactions
- Genetic variations

7 Different CYP450 Isoenzymes involved in Warfarin Metabolism!



Tecarfarin
Human Carboxylesterase 2 (CES2)



Warfarin Metabolism via CYP450 is Complicated by Known Competitors, Inhibitors and Inducers and the Established Impact of Genetic Variants

Enzymes	Substrates	Inhibitors	Inducers
CYP 3A4	amlodipine, simvastatin, warfarin , amiodarone, sildenafil, midazolam, fluoxetine, haloperidol, codeine, oxycodone, methadone, fentanyl	ciprofloxacin, ketoconazole, ritonavir, methylprednisone, imatinib, tamoxifen, cimetidine, grapefruit juice	simvastatin, efavirenz, pentobarbital, carbamazepine, phenobarbital, phenytoin, valproic acid, caffeine
CYP 1A2	alose tron, caffeine, duloxetine, melatonin, ramelteon, tacrine, tizanidine	ciprofloxacin, enoxacin, fluvoxamine, oral contraceptives, phenylpropanolamine	montelukast, phenytoin, smoking components of cigarettes
CYP 2C8	repaglinide, paclitaxel, methadone	gemfibrozil, fluvoxamine, ketoconazole, trimethoprim	rifampin
CYP 2C9	celecoxib, warfarin , phenytoin	amiodarone, fluconazole, miconazole, oxandrolone, capecitabine, etravirine, fluvastatin, metronidazole, Sulfinpyrazone, tigecycline	carbamazepine, rifampin, aprepitant, bosentan, phenobarbital, St. John's wort
CYP 2D6	lidocaine, metoprolol, haloperidol, fluoxetine, amitriptyline, metoclopramide, codeine, oxycosone, tramadol	amiodarone, chlorpromazine, citalopram, bupropion	rifampin, dexamethasone

Tecarfarin was specifically designed to avoid metabolism via the CYP450 Pathway, thus improving safety and efficacy over warfarin

Tecarfarin is Metabolized via the Human Carboxyl Esterase 2 Pathway (CES2) Provides More Effective, Safe, and More Consistent Anti-coagulation

Enzymes	Substrates	Inhibitors	Inducers
CYP 3A4	amlodipine, simvastatin, warfarin , amiodarone, sildenafil, midazolam, fluoxetine, haloperidol, codeine, oxycodone, methadone, fentanyl	ciprofloxacin, ketoconazole, ritonavir, methylprednisone, imatinib, tamoxifen, cimetidine, grapefruit juice	simvastatin, efavirenz, pentobarbital, carbamazepine, phenobarbital, phenytoin, valproic acid, caffeine
CYP IA2	alosetron, caffeine, duloxetine, melatonin, ramelteon, tacrine, tizanidine	ciprofloxacin, enoxacin, fluvoxamine, oral contraceptives, phenylpropanolamine	montelukast, phenytoin, smoking components of cigarettes
CYP 2C8	repaglinide, paclitaxel, methadone	gemfibrozil, fluvoxamine, ketoconazole, trimethoprim	rifampin
CYP 2C9	celecoxib, warfarin , phenytoin	amiodarone, fluconazole, miconazole, oxandrolone, capecitabine, etravirine, fluvastatin, metronidazole, Sulfinpyrazone, tigecycline	carbamazepine, rifampin, aprepitant, bosentan, phenobarbital, St. John's wort
CYP 2D6	lidocaine, metoprolol, haloperidol, fluoxetine, amitriptyline, metoclopramide, codeine, oxycosone, tramadol	amiodarone, chlorpromazine, citalopram, bupropion	rifampin, dexamethasone

CES2 Substrate Drugs

Antiplatelet/Anticoagulants

- Acetylsalicylic acid
- Prasugrel
- Dabigatran etexilate

Angiotensin receptor blockers

- Candesartan cilexetil
- Olmesartan medoxomil
- Azilsartan medoxomil

Antiviral agents

- Tenofovir disoproxil
- Adefovir dipivoxil
- Valacyclovir

CNS agents

- Cocaine
- Heroin
- 6-monoacetylmorphine

Immunosuppressive agents

- Methylprednisolone sodium succinate
- Deflazacort

Oncology agents

- Irinotecan
- Capecitabine

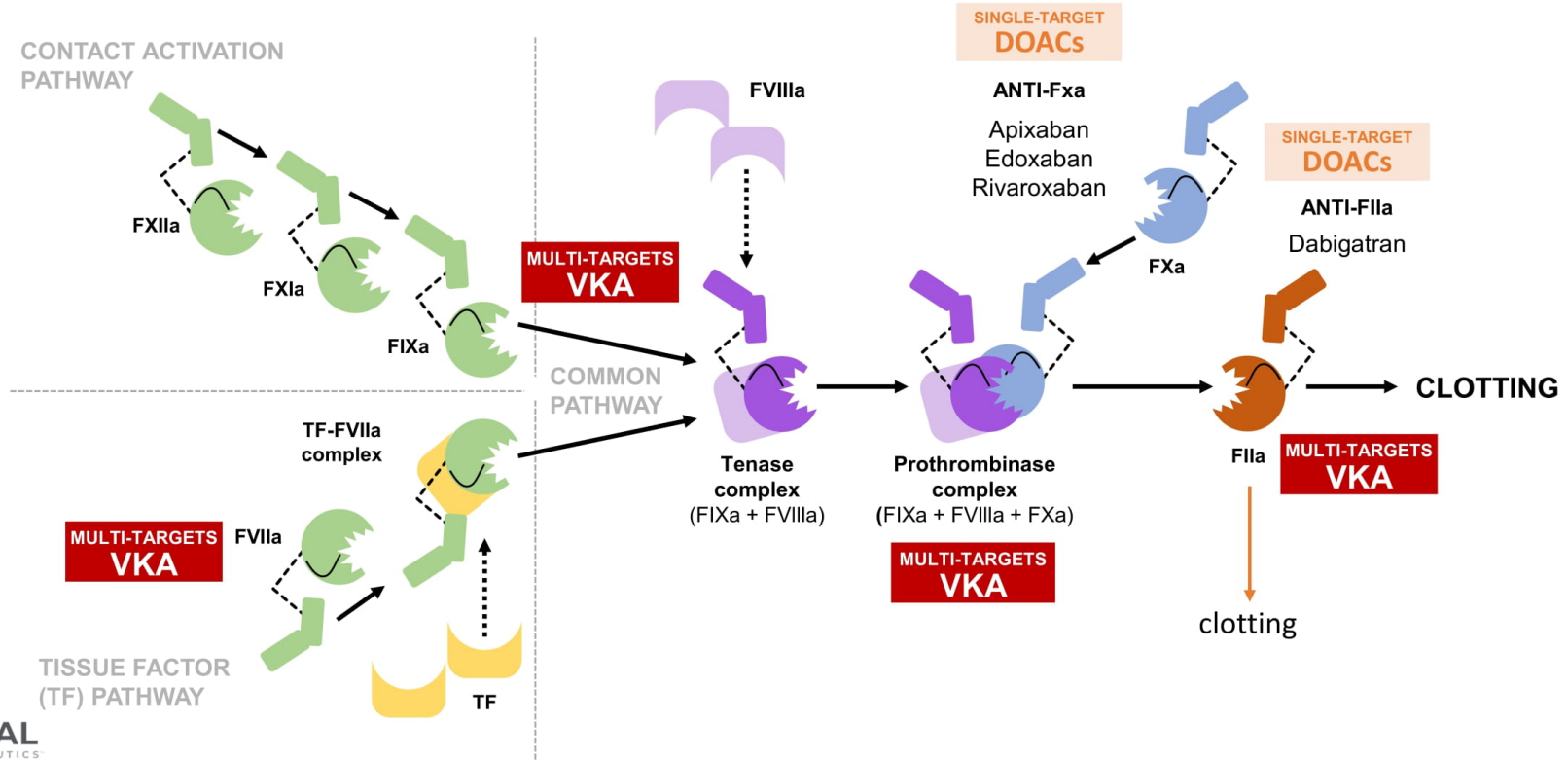
Anesthetic drug

- Procaine

Limited Substrates Identified
Genetic variation exists, but
limited evidence of clinical impact

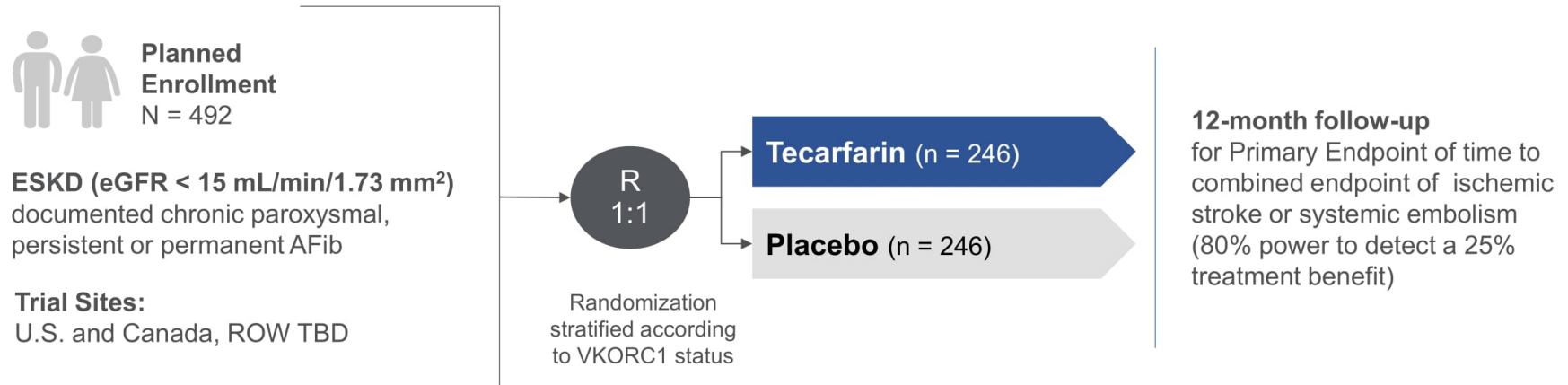
Vitamin K Antagonism Inhibits Multiple Factors (II, VII, IX, X, Proteins C & S) in the Clotting Cascade vs. Single Targets of Newer Agents

Proven mechanism of action resulting in clinically meaningful anticoagulation in certain conditions where DOACs have failed



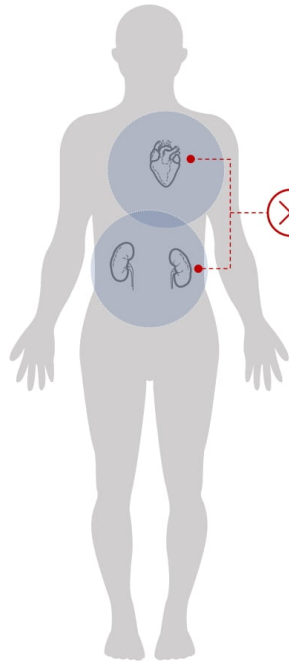
Tecarfarin Phase 3 Trial Design for ESKD and AFib

Tecarfarin vs. Placebo in Patients with ESKD and AFib Randomized, Double-Blind, Placebo-Controlled



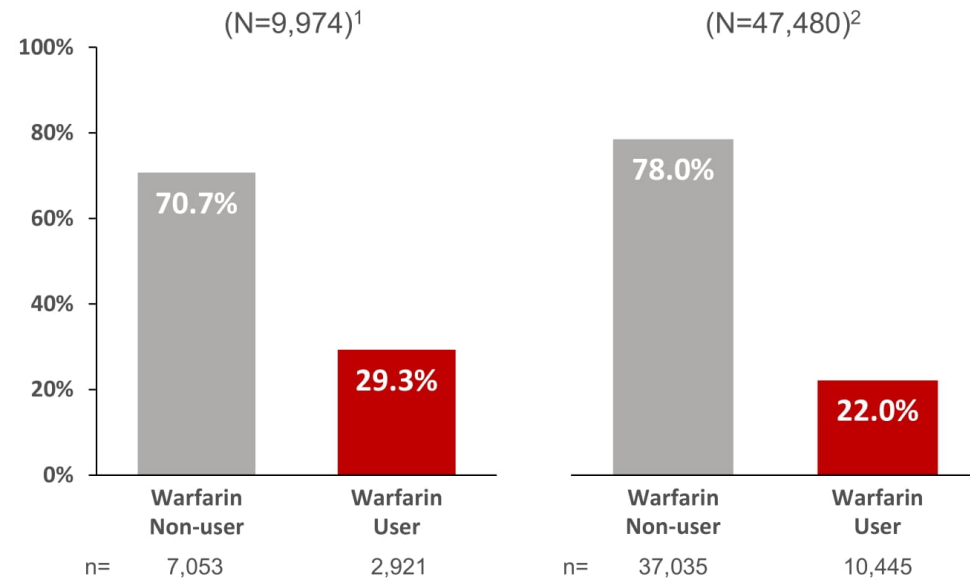
Significant Underserved Patient Populations

Despite the significantly increased risk of stroke in ESKD patients with AFib, most patients are not anticoagulated due to the lack of evidence of benefit



Most patients with ESKD + AFib are not prescribed ANY anticoagulation to reduce their risk of stroke

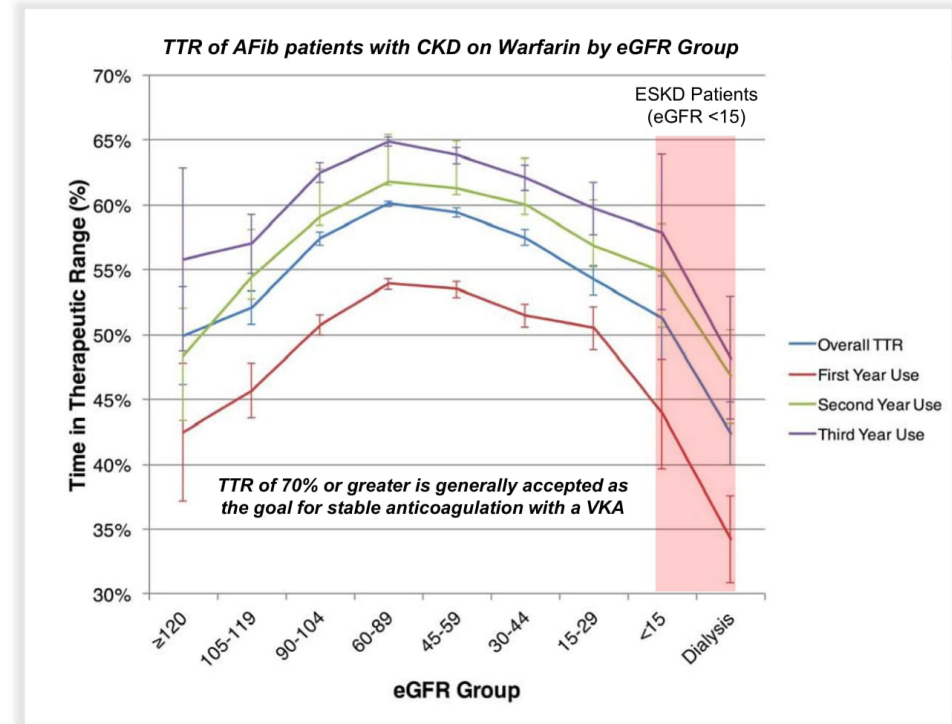
Use of warfarin in ESKD + AFib Patients¹



TTR Decreases with CKD Severity for AFib Patients on Warfarin

AFib Patients with ESKD on Warfarin are Poorly Controlled with TTR of 42-51%, compared to the TTR goal of 70% or greater

- ❖ Time in Therapeutic Range (TTR)^{1,2,5}
 - Well-established FDA metric used to evaluate quality of anticoagulation control (safety and efficacy)
 - Higher TTR levels correlate directly with improved clinical outcomes including rates of death, bleeding, myocardial infarction, stroke, and systemic embolism
- ❖ TTR predictive of clinical outcomes
 - Stage 4 and 5 CKD with AFib: Similar TTR cutoffs predictive of mortality and cardiovascular outcomes^{3,4}
- ❖ Overall TTR for AFib Patients with ESKD on warfarin is 42-51%⁶
- ❖ Only 21% of ESKD patients on dialysis using warfarin achieve TTR ≥60%⁶



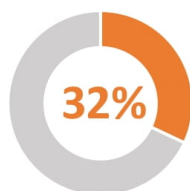
Dabigatran Versus Warfarin in Patients with Mechanical Heart Valves

EXCESS RISK AND NO BENEFIT



Trial terminated prematurely
due to an excess of thromboembolic and bleeding events among patients in the **dabigatran group**

	Dabigatran N=168 N (%)	Warfarin N=84 n (%)
Ischemic or unspecified stroke	9 (5.4)	0
Major bleeding	7 (4.2)	2 (2%)



32%
Dose adjustment or discontinuation of dabigatran
(as-treated analysis)

