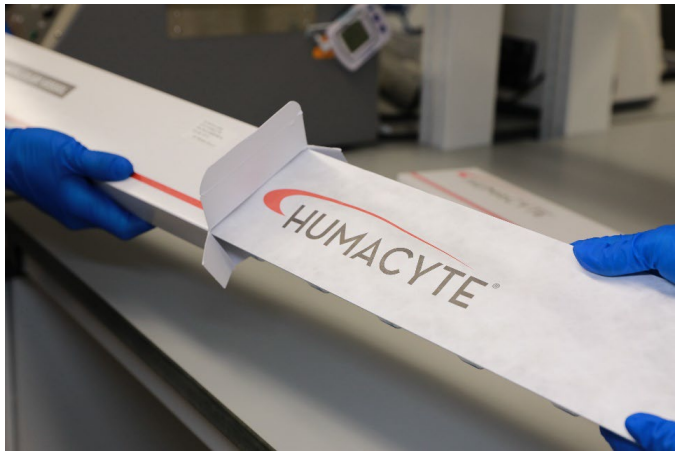
Humacyte®

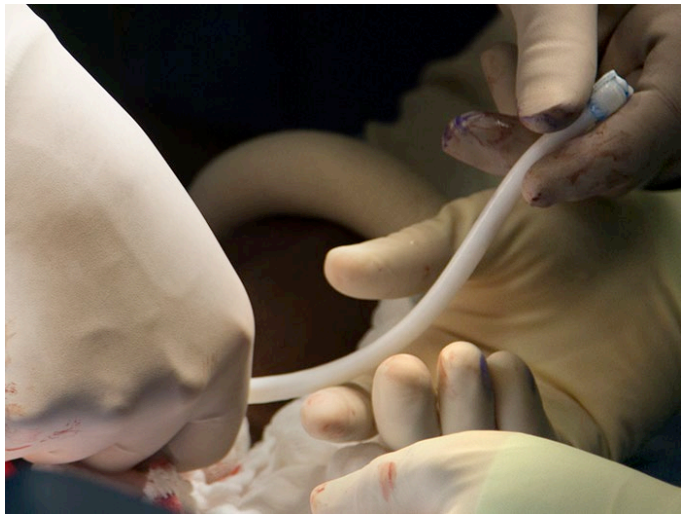
# Universally Implantable Regenerative Human Tissue

# Disclaimer

These slides and the accompanying oral presentation contain forward-looking statements. All statements, other than statements of historical fact, included in these slides and the accompanying oral presentation are forward-looking statements reflecting management's current beliefs and expectations. In some cases, you can identify forward-looking statements by terminology such as "will," "anticipate," "expect," "believe," "intend" and "should" or the negative of these terms or other comparable terminology. Forward-looking statements in these slides and the accompanying oral presentation include, but are not limited to, statements about our plans and ability to commercialize our bioengineered acellular tissue engineered vessels ("ATEV™s") in the United States under the brand name Symvess™ in vascular trauma repair; the anticipated commercialization of our ATEVs and our ability to manufacture ATEVs and other product candidates in sufficient quantities to satisfy our clinical trial and commercial needs; our plans and ability to execute product development, process development and preclinical development efforts successfully and on our anticipated timelines; our plans, anticipated timelines and ability to obtain marketing approval from the U.S. Food and Drug Administration ("FDA") and other regulatory authorities, including the European Medicines Agency, for our ATEVs in other indications and other product candidates; our ability to design, initiate and successfully complete clinical trials and other studies for our product candidates and our plans and expectations regarding our ongoing or planned preclinical and clinical trials; the outcome of our ongoing discussions with the FDA concerning the design of our clinical trials; our anticipated growth rate and market opportunities; the potential liquidity and trading of our securities; our ability to raise additional capital in the future; our ability to use our proprietary scientific technology platform to build a pipeline of additional product candidates; the anticipated characteristics and performance of our ATEVs; the expected size of the target populations and addressable markets for our product candidates; the anticipated benefits of our ATEVs relative to existing alternatives; our assessment of the competitive landscape; the degree of market acceptance of ATEVs and the availability of third-party coverage and reimbursement; the implementation of our business model and strategic plans for our business; our expectations regarding our strategic partnership with Fresenius Medical Care Holdings, Inc. to sell, market and distribute our 6 millimeter ATEV for certain specified indications and in specified markets; the performance of other third parties on which we rely, including our third-party manufacturers, our licensors, our suppliers and the organizations conducting our clinical trials; our ability to obtain and maintain intellectual property protection for our product candidates as well as our ability to operate our business without infringing, misappropriating or otherwise violating the intellectual property rights of others; our ability to maintain the confidentiality of our trade secrets, particularly with respect to our manufacturing process; our compliance with applicable laws and regulatory requirements, including FDA regulations, healthcare laws and regulations, and anti-corruption laws; our ability to attract, retain and motivate qualified personnel and to manage our growth effectively; our future financial performance and capital requirements; our ability to implement and maintain effective internal controls; and the impact of the overall global economy and increasing interest rates and inflation on our business. These statements relate to future events or to our future financial performance and involve known and unknown risks, uncertainties and other factors that may cause our actual results, performance or achievements to be materially different from any future results, performance or achievements expressed or implied by these forward-looking statements. The potential risks and uncertainties that could cause actual results to differ from the results predicted include, among others, those risks and uncertainties included under the captions "Risk Factors" and "Management's Discussion and Analysis of Financial Condition and Results of Operations" in our Form 10-K for the year ended December 31, 2024, our quarterly report on Form 10-Q for the quarter ended September 30, 2025, each filed by Humacyte with the Securities and Exchange Commission, and in future filings made with the Securities and Exchange Commission from time to time. Any forward-looking statements contained herein are based on assumptions that we believe to be reasonable as of the date hereof. Except as required by law, we assume no obligation to update these forward-looking statements, even if new information becomes available in the future. This presentation shall not constitute an offer to sell or the solicitation of an offer to buy, nor shall there be any sale of our securities, in any state or other jurisdiction in which such offer, solicitation or sale would be unlawful prior to the reregistration or qualification under the securities laws of any such state or other jurisdiction.

# Humacyte is a Leader the Field of Regenerative Medicine:
## Bioengineered Tissues & Organs



- Off-the-shelf, no special preparation required
- Universally implantable with no immuno-suppression
- Regenerate as the patient's own tissue

**Category-Defining Innovation that Creates New Tissues**

# Universally Implantable Regenerative Human Tissue

Humacyte®

## U.S. FDA Approved

**FDA approved Symvess® (ATEV) BLA** in December 2024 for treatment of extremity vascular trauma; **U.S. market launch commenced 2025**

## First-in-Class Technology and Manufacturing Platform

**Large addressable markets**

trauma, dialysis, peripheral artery disease, diabetes, coronary bypass

## Commercial-Scale Manufacturing

**Commercial-scale manufacturing** in place with annual capacity of up to 40,000 ATEVs in existing facility

## Validated through Multiple Partnerships

MAYO CLINIC

U.S. DEPT OF DEFENSE

Breakthrough T1D™

FRESENIUS MEDICAL CARE

# Humacyte Leadership & Board

## Leadership Team

**Laura E. Niklason, MD, PhD**
**Founder, President, Chief Executive Officer**

**Dale Sander**
**Chief Financial Officer, Chief Corporate Development Officer**

**Shamik Parikh, MD**
**Chief Medical Officer**

**Heather Connelly**
**Chief Quality Officer**

**Lisa Molyneux**
**EVP, Enterprise Planning & Analysis**

**Sabrina Osborne**
**Chief People Officer**

**Rick McElheny**
**SVP, Business Development**

## Board of Directors

**Kathleen Sebelius**
*Chair of the Board*

John P. Bamforth, PhD

Emery N. Brown, MD, PhD

Michael T. Constantino

Brady W. Dougan

Charles Bruce Green, MD

Keith Anthony Jones, M.D.,

Laura E. Niklason, MD, PhD

Todd M. Pope

Diane Seimetz, PhD

Max Wallace, JD

Susan Windham-Bannister, PhD

## Prior Experience

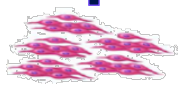
Lilly
AstraZeneca
GSK
Harvard Medical School
Merck
Pfizer
U.S. Department of Heath and Human Services
Duke University School of Medicine
Johnson & Johnson
AVITA Medical
Teleflex
Fresenius
Novartis
Yale University School of Medicine

# Platform & Manufacturing:
## Enable Broad Pipeline of Regenerative Medicine Products

Humacyte®

### Bioengineering Platform

**1 Cell seeding**



Working cell stock

Cells transferred onto polymer mesh

**2 Tissue formation**

Cells proliferate & build extracellular matrix

Polymer mesh degrades, leaving vascular cells and extracellular matrix

**3 Cell removal and packaging**

Decellularization solutions clean and remove vascular cells from vessel

*Enables creation of universally implantable tissues and organs*

### Commercial-Scale Manufacturing

*Strategically designed with modular capabilities to manufacture products at scale*

**Vascular tissue constructs (ATEV)** ⟷ **Advanced tissue constructs** ⟷ **Advanced organ systems**

**Our platform technology enables development of a broad range of product candidates**

# Symvess Demonstrates Mechanical Strength and Remodeling with Patient's Own Cells

Humacyte®

## Mechanical

- **Symvess withstands the forces associated with suturing and the arterial blood flow.[1]**

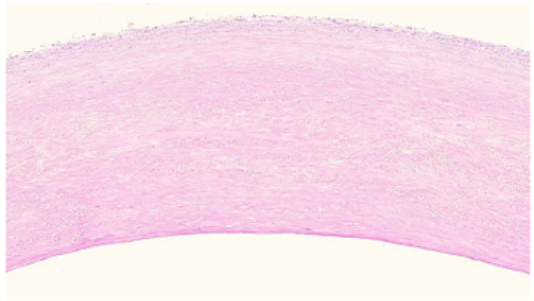
**DIFFERENCES OF VESSEL MECHANICAL PROPERTIES[2]**

| Vessel Type | Suture Strength (g) | Burst Pressure (mmHg) |
|---|---|---|
| **Symvess** | **251** | **3727** |
| Human Saphenous Vein | 196 | 1599 |
| Human Internal Mammary Artery | 138 | 3196 |

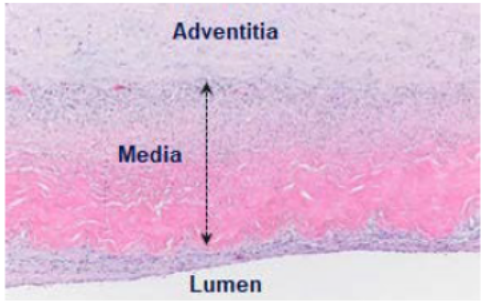
## Biological

- **Symvess extracellular matrix can support cell binding and proliferation.[1]**

**PRE-IMPLANTATION***



**4 WEEKS POST-IMPLANTATION****




Extracellular Matrix  Host Cell Infiltration

* H&E-stained cross-section of Symvess pre-implantation

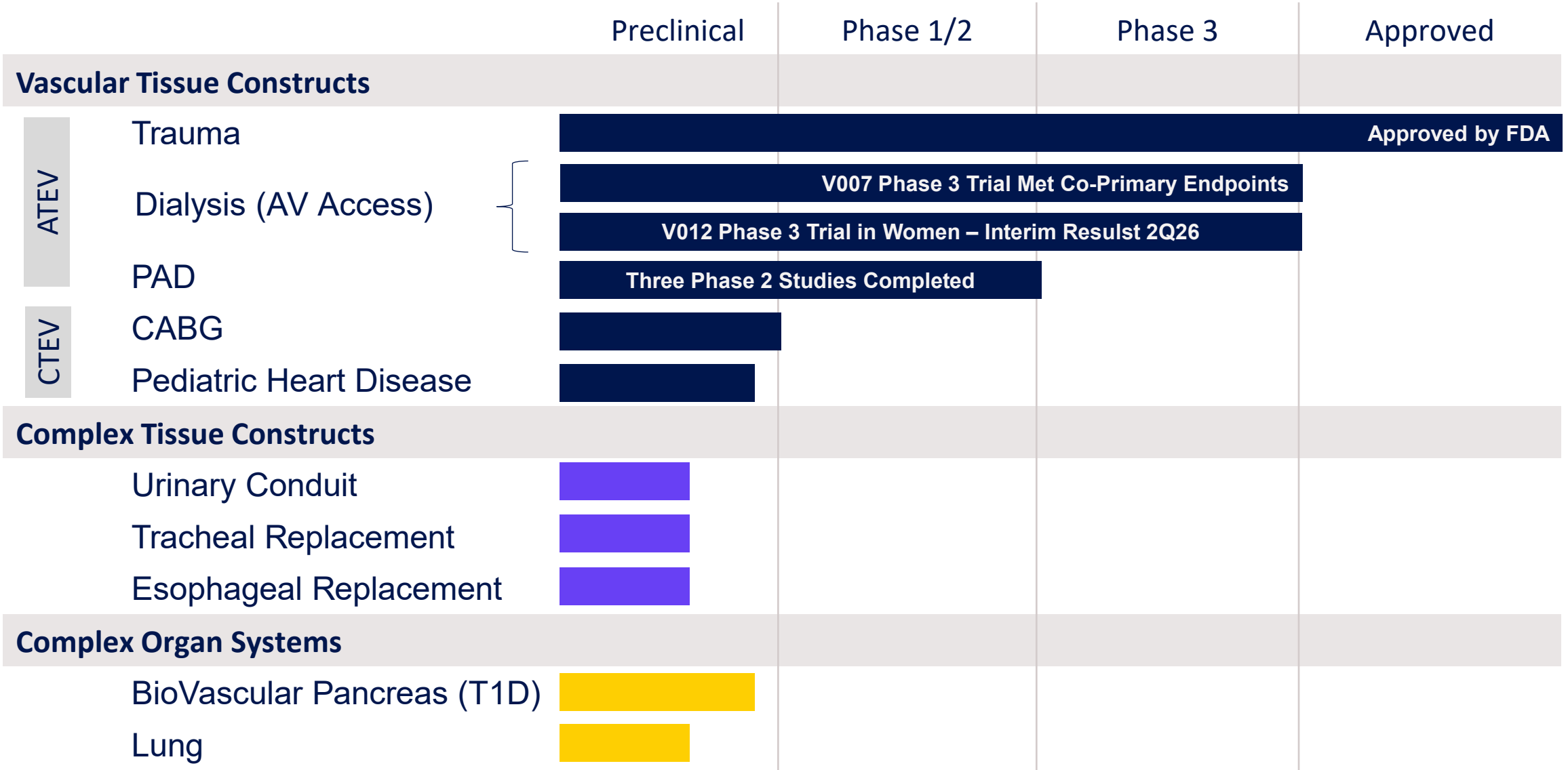
** Observed in porcine preclinical setting of H&E-stained cross-section of Symvess mid-graft tissue explant revealing high density and infiltration depth of host cells.[3]

**Once implanted, Symvess integrates with host cells.**
**The body's host cells recognize the human matrix and populate the vessel in a circumferential manner.**

1. Symvess U.S. Prescribing Information. Durham, NC. Humacyte Global, Inc. 2. Nash KM, et al. Evaluation of tissue-engineered human acellular vessels as a Blalock–Taussig–Thomas shunt in a juvenile primate model. JTCVS Open 2023;15:433-45. 3. Kirkton RD, et al. Evaluation of vascular repair by tissue-engineered human acellular vessels or expanded polytetrafluoroethylene grafts in a porcine model of limb ischemia and reperfusion. *J Trauma Acute Care Surg.* 2023;95: 234–241.

acellular tissue engineered vessel-tyod Symvess™

# Pipeline with Multiple Potential Commercial Launches




Symvess™
acellular tissue
engineered vessel-tyod
FDA Approved in
Extremity Vascular Trauma
Humacyte®

# Symvess is FDA Approved in Extremity Vascular Trauma

Humacyte®

acellular tissue engineered vessel-tyod
Symvess™

- **Repopulates with the patient's cells**[1-2,3]
- **Low susceptibility to infection**[4]
- **No immune response observed**[1-3,5]
- **Off-the-shelf, ready to use**[1,3]
- **Low amputation results**[1]

## INDICATION

SYMVESS is an acellular tissue engineered vessel indicated for use in adults as a vascular conduit for extremity arterial injury when urgent revascularization is needed to avoid imminent limb loss, and autologous vein graft is not feasible.

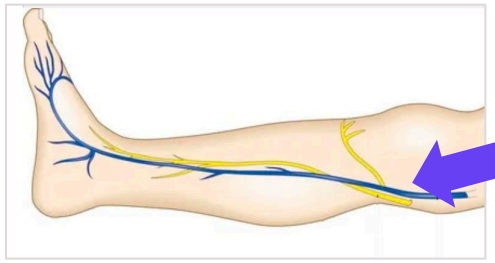
PLEASE SEE ACCOMPANYING FULL PRESCRIBING INFORMATION AT SYMVESS.COM, INCLUDING BOXED WARNING.

**REFERENCES: 1.** Symvess U.S. Prescribing Information. Durham, NC. Humacyte Global, Inc. **2.** Kirkton RD, et al. Bioengineered human acellular vessels recellularize and evolve into living blood vessels after human implantation. *Sci Transl Med*. 2019;11(485):eaau6934. **3.** Dahl S, et al. Readily available tissue-engineered vascular grafts. *Sci Transl Med*. 2011 Feb 2;3(68):68ra9. **4.** Wang J, et al. Biological mechanisms of infection resistance in tissue engineered blood vessels compared to synthetic expanded polytetrafluoroethylene grafts. *JVS Vasc Sci*. 2023;4:100120. **5.** Moore EE, et al. Bioengineered Human Arteries for the Repair of Vascular Injuries. *JAMA Surg*. 2024 Nov 20:e244893.

# Vascular Trauma Injuries – Symvess Value Proposition

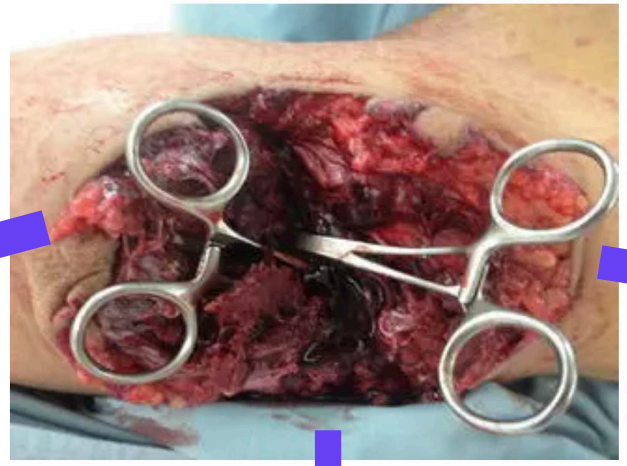
- Common causes of vascular injuries include workplace injuries, car accidents, gunshots and stabbings, and sports injuries
- Symvess address major drawbacks of current treatment options:

**Symvess is immediately available, off-the-shelf, and does not require further injuring the patient**

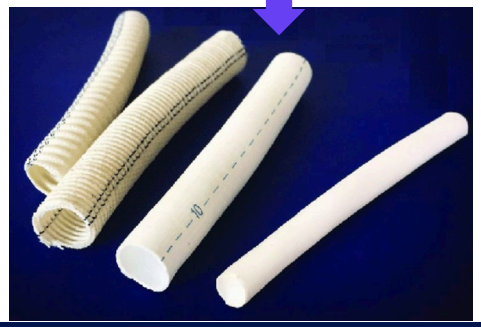


**Vein is the standard of care, but takes valuable time, delaying revascularization**

Exit wound of a shotgun injury



**Amputation**



**Prosthetic grafts are quick, but have infection risk and high rates of amputation**

# Two Studies Were Used to Support FDA Approval

## First Study: CLN-PRO-V005 Phase 2/3 Pivotal Trial In U.S. and Israel

- Single-arm, open label study
- Conducted at Level 1 trauma centers
- Arteria injury repair
- Extremity injuries at high risk of contamination / infection
- 69 patients enrolled as of data cut off
- As agreed upon with FDA, focus for BLA filing were 51 patients with extremity injuries

### Statistical Analysis Plan

Historical Benchmark Comparator

> Systematic literature review of synthetic grafts in vascular trauma

Primary Comparison

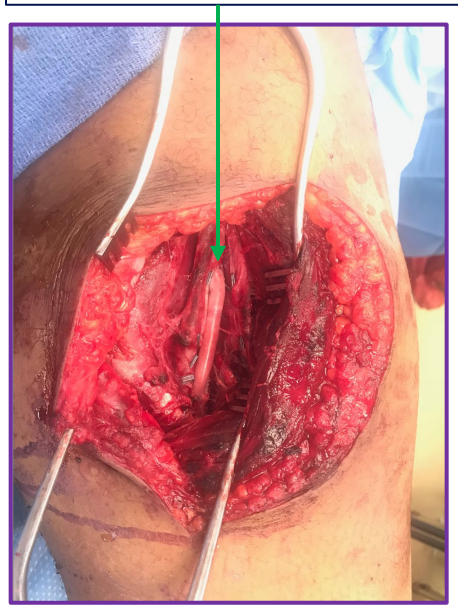
> 30-day endpoint of patency

Secondary Comparisons

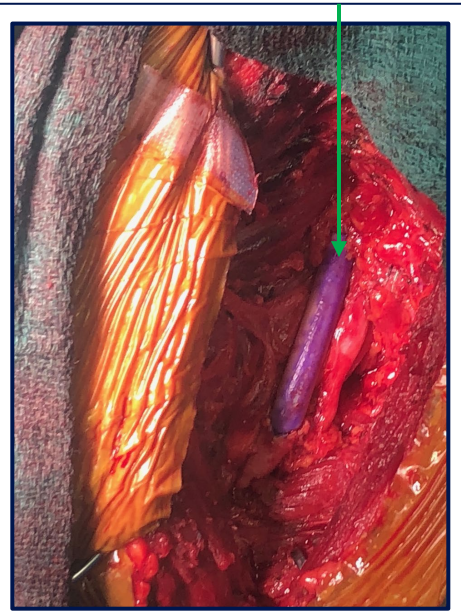
> 30-day infection rate

> 30-day amputation rate

### Examples of Symvess Implants in V005 Study



Gunshot Wound



Industrial Accident

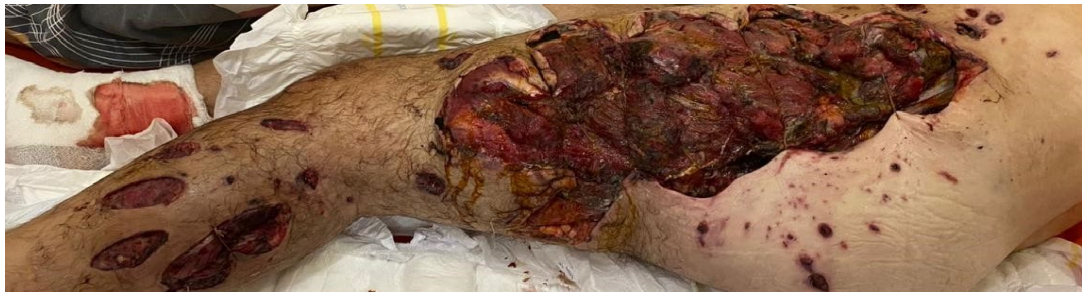
Knee Dislocation

# Ukraine Real World Experience of Symvess Use in Vascular Repair

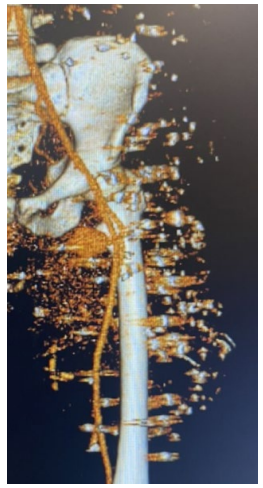
## Second Study: V017 Humanitarian Program in Ukraine

- At request of Ukraine surgeons Humacyte supported humanitarian program for patients injured in conflict
- 19 patients received Symvess
- At suggestion of FDA, patients from humanitarian program were included in BLA filing
  - 17 consented for data collection and study participation
  - 16 patients had extremity trauma repair (one patient required Symvess for Iatrogenic trauma repair)

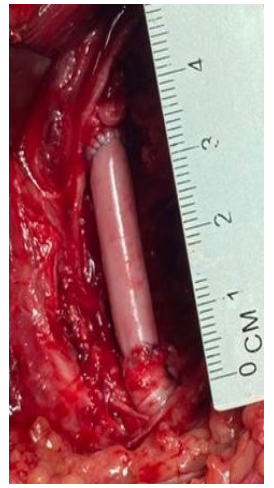
## Case Study of Patient Treated in Ukraine Program



Ukraine Patient Blast Injury



Pre-op CT Scan




Symvess repair of Femoral artery

Walking once again (Day 113)

# Clinical Improvement with Symvess over Synthetics

acellular tissue engineered vessel-tyod Symvess™



## Two studies demonstrate improved outcomes compared to synthetic graft benchmark

Symvess represents a new definitive and permanent repair option in patients with extremity arterial injury when a vascular graft is needed and no vein is available.

Symvess improves secondary patency and has lower amputation and infection rates compared to synthetic options.

| Outcome Day 30 | Combined Symvess V005 and V017 Studies (N=67) | Synthetic Graft Benchmark |
|---|---|---|
| Primary Patency | 87.1% | 78.9% |
| Secondary Patency | 91.5% | 78.9% |
| Conduit Infection rate | 0.9% | 8.4% |
| Amputation rate | 4.5% | 24.3% |
| Death rate (all cause) | 3. 5% | 3.4% |

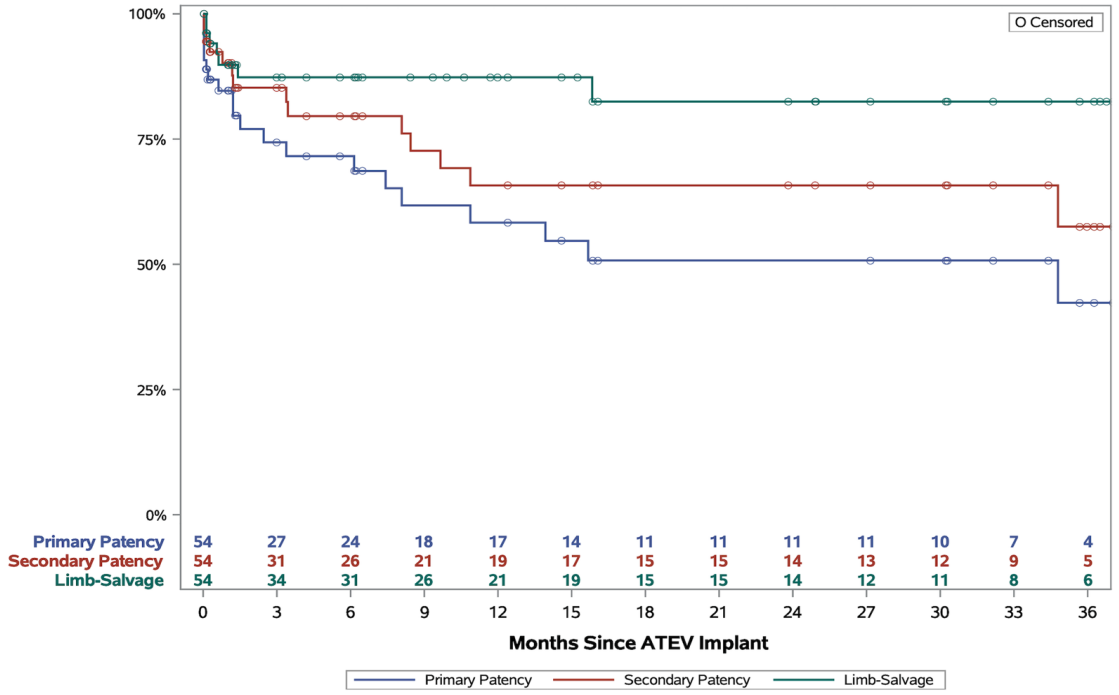
Moore EE, et al. *JAMA Surg*. 2024 Nov 20:e244893. ; Humacyte BLA filed December 11, 2023.

# Durability of Symvess in Trauma Repair

## Long-Term V005 Results[1]

After up to 36 months of follow-up, patients demonstrated:

- High rates of limb salvage
- low rates of infection
- no unprovoked structural failures




## Long-Term V017 Results[2]

- Trauma patients with battlefield injuries in Ukraine were followed for up to 18 months.
- Wartime patients treated with Symvess were observed to have:
  - High rate of patency (87.1%)
  - 100% limb salvage
  - Zero cases of conduit infection
  - Zero deaths


Publications

[1]Curi MA, et al. J Vasc Surg Cases Innov Tech. 2025 Nov

[2]Parikh S, et al.. Mil Med. 2025 Sep

# Symvess Limb Salvage and Infections are Similar to Vein

acellular tissue engineered vessel-tyod Symvess™

- Symvess compared to *Prospective* Observational *V*ascular *I*njury *T*rial (*PROOVIT*) registry
- ***Retrospective comparison to existing registry***
- Symvess patients (n=67) were propensity-matched 1:2 to PROOVIT patients (n=134) who were previously treated with vein.
  - Identical injured arteries
  - Similar injury severity scores (though SYMVESS patients were more severe)

| Day 30 Outcomes for Symvess (Average 16-day follow-up for vein) | V005 + V017 (N=67) | *PROOVIT* Autologous Vein (N=134) | P-value |
|---|---|---|---|
| Primary Patency | 86.6% | 91.8% | 0.276 |
| Secondary Patency | 91.0% | 97.7% | 0.077 |
| Amputation rate | 7.5% | 8.2% | 0.852 |
| Conduit Infection rate | 1.5% | 0.0% | 0.333 |
| Death rate (all cause) | 4.5% | 4.5% | 0.991 |
| Reintervention Thrombosis/Stenosis | 6.0% | 8.2% | 0.550 |

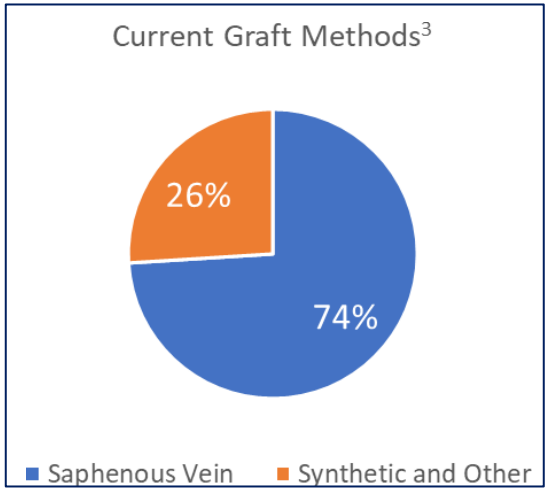
Rajani RR, et al. *Trauma Surg Acute Care Open* 2025; **10**:e001814

Clinical Data

# U.S. Vascular Trauma Market – Total Addressable Market for Symvess

| Total Vascular Trauma Patients (All Injuries)[1] |
|---|
| 79,000 |
| Emergent Vascular Trauma – 56,000<br>Iatrogenic Vascular Trauma – 23,000 |

| Target U.S. TAM for Symvess Based on Hospital Claims Data[2] |
|---|
| 26,000 |
| Emergent Vascular Trauma – 18,667<br>Iatrogenic Vascular Trauma – 7,333 |




| Symvess-Eligible Patients | Exclusions |
|---|---|
| • Type of repair: Bypass, repair, replacement, supplement, destruction or restriction<br>• Location: Extremity arteries of interest<br>• Iatrogenic: Arterial injuries co-occurring with other surgeries | • Vein injury / repair<br>• Injuries to torso, head, neck, wrist, hand, ankle, foot<br>• Primary repair: Ligation or endovascular repair |

[1]Third-party market research based on procedural volumes (2019) and secondary literature search
[2]Based on analysis of Definitive Healthcare (DHC) Claims Database 2022, claims as of November 2023. Adjusted to reflect estimate the database captures approximately 60% of procedures:
Diagnosis (Dx) Codes: Identify Injury type, location
Procedure Codes: ICD-10 PCS or CPT
[3]Based on analysis of Prospective Observational Vascular Injury Trial (PROOVIT) registry

# Drivers of U.S. Commercial Launch in Vascular Trauma

Humacyte

Symvess™

acellular tissue engineered vessel-tyod

### Concentrated Market

Approximately 200 Level 1 trauma centers in U.S.

Approximately 3,000 vascular surgeons across civilian and military market opportunities

### Superior Clinical Results

In the civilian and military clinical studies, Symvess was observed to have high rates of patency and low rates of amputation and infection

### The Right Team

Sales team of 12 executives who are experienced in vascular and/or trauma surgery and regenerative therapies

Sales team is complemented by Medical Affairs, market access, and marketing teams

### Health Economics

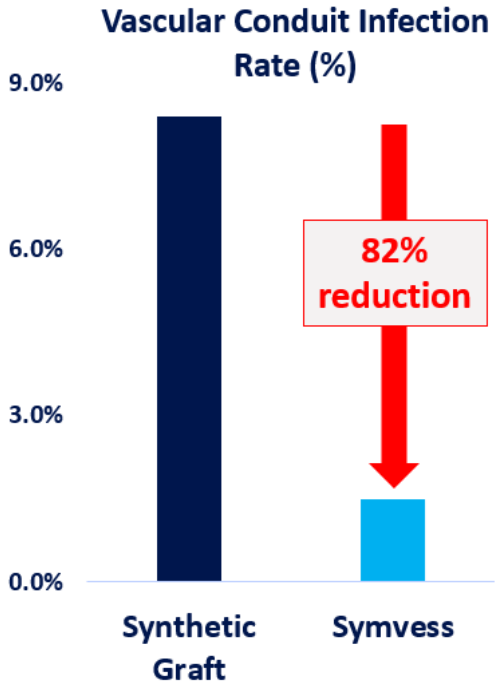
Budget Impact Model projects that the per-patient cost of treating patients with Symvess is estimated to be less than the cost of treating with synthetic grafts and other conduits

# Symvess in Extremity Injury: Savings in Hospital Charges

acellular tissue engineered vessel-tyod Symvess™

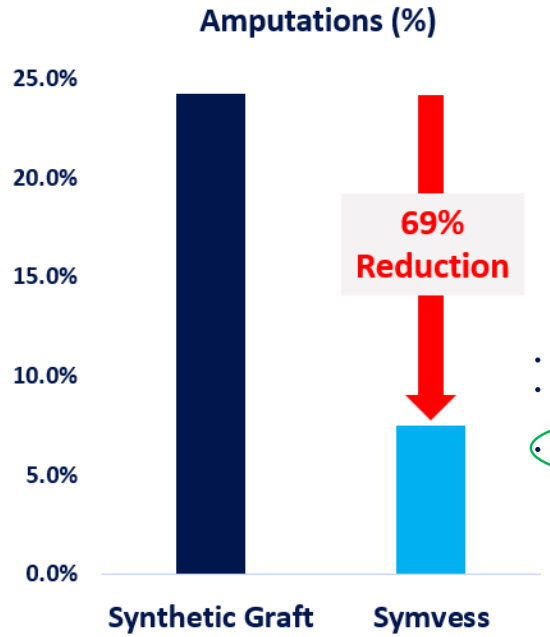
Healthcare Economics

Symvess is associated with meaningful reductions in hospital charges when used in patients lacking feasible saphenous vein




Additional hospital charges associated with each vascular graft infection:
**$589,921**

- Infection charge per Synthetic graft: $49,553
- Infection charge per Symvess: $8,848
- Potential Savings with EACH SYMVESS: $40,705




Additional hospital charges associated with each amputation:
**$492,986**

- Amputation cost per Synthetic graft: $119,796
- Amputation cost per Symvess: $36,974
- Potential Savings with EACH SYMVESS: $82,822

**1.** Velez, F. F., Rajani, R. R., Malone, D. C., et al. Journal of Medical Economics, 28(1), 323–334. **2.** Brouwer E, Velez FF, Tan J. Submitted manuscript undergoing peer review.

# Symvess Budget Impact Model (BIM) in Extremity Arterial Injury

acellular tissue engineered vessel-tyod Symvess™

Healthcare Economics

**Published in *J Med Econ,* showed use of Symvess in patients without feasible saphenous vein resulted in a net cost reduction[1]**

JOURNAL OF MEDICAL ECONOMICS
2025, VOL. 28, NO. 1, 323–334
https://doi.org/10.1080/13696998.2025.2469460
Article /2469460

Taylor & Francis
Taylor & Francis Group

ORIGINAL RESEARCH

OPEN ACCESS

Budget impact model of acellular tissue engineered vessel for the repair of extremity arterial trauma when autologous vein is not feasible

Fulton F. Velez[a], Ravi R. Rajani[b], Daniel C. Malone[c], Lucille A. Sun[d], Lisa Bloudek[d], Kai Carter[a], Mary Panaccio[a] and Laura E. Niklason[a]

[a]Humacyte Global, Inc, Durham, NC, USA; [b]Department of Surgery, Emory University, Atlanta, GA, USA; [c]Strategic Therapeutics, LLC, Tucson, AZ, USA; [d]Curta, Inc, Seattle, WA, USA; [e]Independent Consultant, New York City, NY, USA

ABSTRACT

**Aims:** To predict the budget impact of Symvess (Symvess is a trademark of Humacyte Global, Inc.) (acellular tissue engineered vessel-tyod [ATEV]) for extremity arterial trauma repair when autologous vein repair is not feasible.

**Materials and methods:** The 3-year budget impact of adding ATEV as a repair option alongside autologous vein, prosthetic graft, and "non-autologous other" grafts was evaluated from the perspectives of a Level I trauma center and third-party commercial payers. Conduit-specific complication rates were obtained from two clinical studies for ATEV and from the published literature and analysis of the PROOVIT registry for other conduits. Costs were compared pre- and post-ATEV availability. Conduit-related costs and complications included conduit infections, amputations, vein harvest site infection, surgical re-interventions, rehabilitation after amputation, and 12-month post-discharge costs. Impact on operating room (OR) time and readmissions was evaluated. A sensitivity analysis was conducted to evaluate parameter uncertainty.

**Results:** With introduction of ATEV, there was a 29.8% reduction in amputations and a 29.5% reduction in graft infections over 3 years. From a Level I trauma center perspective, seven patients were expected to receive an ATEV over 3 years, with cumulative cost savings of $80,650 (2.3% decrease). OR time would decrease by 8.6 h, and readmission-related costs would be reduced by 16.7% with ATEV availability. From the third-party commercial payer perspective, 35 patients were expected to receive ATEV, with a budget impact showing a savings of −$0.08 per member per month after 3 years. For trauma centers, sensitivity analysis showed that cost drivers were amputation risk associated with "non-autologous other" graft types and market share of autologous vein (short ischemia time).

**Limitations:** Uncertainty surrounding model parameters.

**Conclusions:** ATEV was projected to be cost-saving over 3 years for both trauma centers and third-party payers due to reductions in the costs related to amputations and conduit infections.

ARTICLE HISTORY
Received 28 January 2025
Revised 14 February 2025
Accepted 17 February 2025

KEYWORDS
Acellular tissue engineered vessel; cryopreserved allograft; bovine xenograft; prosthetic graft; vascular trauma; arterial repair; autologous vein; budget impact; cost

JEL CLASSIFICATION CODES
A12; I10; H51

Introduction

Vascular trauma poses a significant clinical burden in terms of disability and loss of life[1]. The use of autologous vein, typically the greater saphenous vein, remains the gold standard for extremity arterial injury repair due to favorable patency outcomes, infection resistance, low amputation rates, and improved rates of freedom from conduit-related complications[2–4]. Unfortunately, many patients do not possess an adequate vein for autologous injury repair, and the field has seen limited innovations in conduits over the past 60 years[4].

An analysis of patients with lower extremity arterial injuries from the National Trauma Data Bank (NTDB) research dataset ($n = 4,406$) found that the overall mortality was 3.2%, and 11.3% of patients underwent amputation[5]. A recently published analysis of 8,780 patients in the NTDB with extremity arterial trauma found that, compared to repair with autologous vein, use of a prosthetic (i.e. synthetic) conduit was associated with a 2.8-fold higher rate of upper limb amputation and a 1.3-fold higher rate of lower limb amputation[6]. Additionally, reintervention rates were 50% higher with prosthetic conduit compared to autologous vein repairs[6]. Furthermore, recent unpublished analyses of linked hospital chargemaster and claims data have shown the impact of in-hospital and post-discharge complications on costs, which disproportionately affect patients treated with grafts other than autologous vein[2]. Hence, when use of autologous vein is not feasible, the treatment options available to patients and surgeons for repair of extremity arterial injury are suboptimal[4–6].

CONTACT Fulton F. Velez fvelez@humacyte.com Field Value and Market Access, Humacyte, Inc., 2525 E. Highway NC 54, Durham, NC 27713, USA

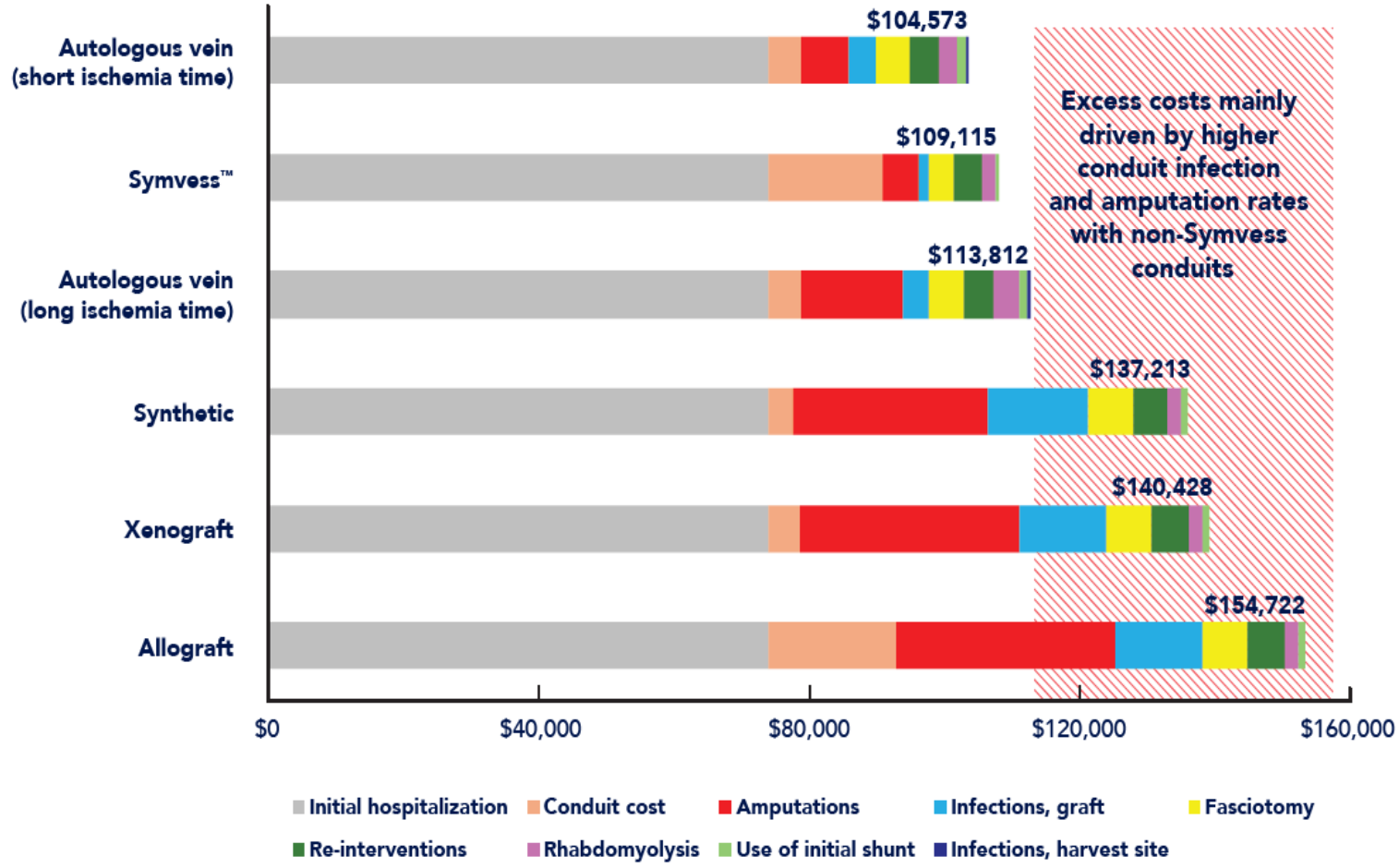
Supplemental data for this article can be accessed online at https://doi.org/10.1080/13696998.2025.2469460.

This article was originally published with errors, which have now been corrected in the online version. Please see Correction (https://doi.org/10.1080/13696998.2025.2477875).



www.tandfonline.com/ijme

**At its current price point of $17,000, Symvess was shown to be the second-most economical arterial graft, after saphenous vein[1]**




**1.** Velez, F. F., Rajani, R. R., Malone, D. C., et al. Journal of Medical Economics, 28(1), 323–334. **2.** Brouwer E, Velez FF, Tan J. Submitted manuscript undergoing peer review.

# Department of Defense Support

acellular tissue engineered vessel-tyod Symvess™

**Symvess was invested in, and vetted by, the Department of Defense (DoD) in recognition of its benefit in battlefield injuries for warfighters**

| DEPARTMENT OF DEFENSE SUPPORT |
| --- |
| Symvess (ATEV) for Vascular Trauma designated as a **"Priority Product"** by DoD<br>• designation created by Public Law 115-92 to expedite the development and FDA review of DoD priority technologies |
| V005 Phase 3 clinical trial was partially funded by the DoD |
| Symvess successfully treated Ukrainian warfighters, resulting in 100% limb salvage |
| FY 2026 DoD Appropriations Act includes funding for the evaluation and incorporation of biologic vascular repair technologies for warfighters |

*In civilian mass-casualty situations, having Symvess on the shelf can also help with response to terrorism/other threats, since surgeons can operate more quickly and treat more patients, not having to take time to harvest vein*

# AV Access for Dialysis

Humacyte®

# AV Access for Hemodialysis Has Limitations

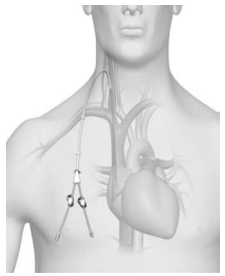
## Estimate of Permanent Access Procedures Performed in U.S.

**~60% AV fistulas**

Primary/AV Fistula (Autogenous)

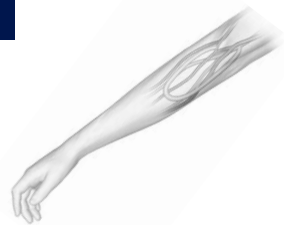
Market targeted by ongoing V007 Phase 3 Trial

**~20% Catheters**



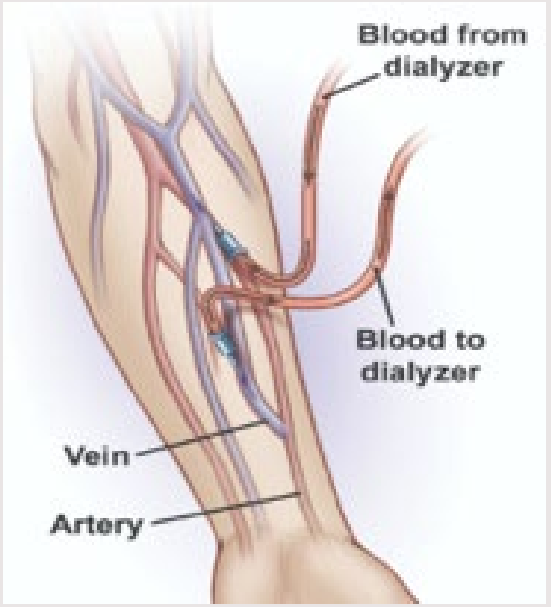
Venous / Temporary Catheter

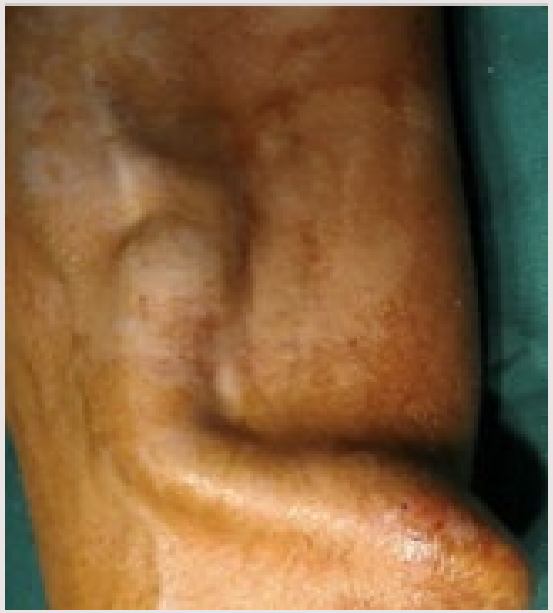
**~20% Grafts**



Secondary / Graft

## Limitations of AV Fistulas (Current Standard of Care)



- ~40% of fistulas fail to mature
- Even the fistulas that do mature take 3-6 months to become usable for dialysis
  - Catheter infection rates are up to 200% per patient-year

# ATEV is Designed to Address Failures in AV Access

***ATEV provides potential for improved patient outcomes***

- ATEV usable for dialysis after only four weeks
- ATEV reduces catheter contact time, thereby reducing risk of catheter infection
- >80% of ATEVs functional for dialysis at 6 months
- ATEV infection rate is comparable to AVF
- Opportunity to reduce cost of access failures and other complications:
  - Access failures and complications
  - Dialysis complications
  - Infections

FRESENIUS MEDICAL CARE

Strategic collaboration with FMC, the largest provider of renal care services

RMAT

RMAT designation granted by FDA

# Current AV Access in Women Work Poorly and is Expensive

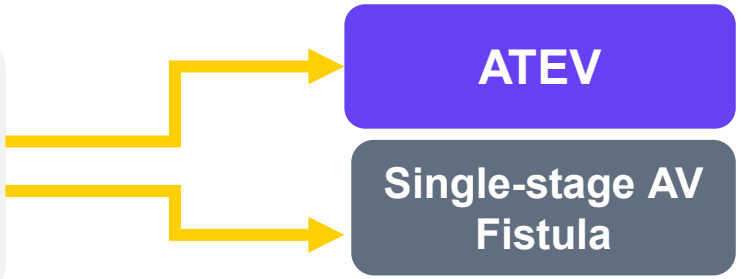
**Partnered with Fresenius / Frenova Renal Research to identify the hemodialysis subpopulations with highest unmet needs**

**Analysis of 178,575 adults with in-center hemodialysis established that:**

- Women are more likely to use AVG ± CVC for access within 90 days of initiation
  - Women have up to 90% increased risk of AVG ± CVC use, as compared to men
- AVG ± CVC access has much higher complication rates: ~2X higher than AVF
  - Nearly $3 billion spent by Medicare in 2013 for on access complications/maintenance
  - Top quintile of dialysis patients cost between **$91,841 to >$155,632 annually to maintain access**
- Women are more likely to fail AVF maturation: **Cost >$30,000 in first year**
  - Women are 20% more likely to fail AVF maturation
  - Women are 20% more likely to have multiple access failures in the first 6 months
  - Women are 24% more likely to have multiple hospitalizations for access complications
- Some female sub-groups are at especially high risk
  - Example: Obese, diabetic women have **excess costs of ~$27,000 to $91,000 during the first year**

# V007 Top-Line Results – ATEV Met Co-Primary Endpoints

- Subjects with end-stage renal disease in need of dialysis
- Enrollment completed April 2023, 242 total subjects




***ATEV demonstrated superior function and patency at six and 12 months (co-primary endpoints) compared to autogenous fistula, the current standard of care for hemodialysis***

| Co-Primary Endpoints | ATEV (N=123) | AVF (N=119) | p-value |
|---|---|---|---|
| Functional Patency at Month 6 | 81.3% | 66.4% | 0.0071 |
| Secondary Patency at Month 12 | 68.3% | 62.2% | |

- More adverse events were reported in patients on the ATEV treatment arm than those on the AV fistula treatment arm:
  - More thromboses in the ATEV group, but virtually all were resolved
  - A number serious events occurred more frequently in the AVF arm:
    - Two ruptures of AVF (a potentially fatal event), none for ATEV
    - Substantially more "steal" (ischemia of the hand), surgical revisions, and balloon-assisted maturation in the AVF group compared to the ATEV group

# V007 Superior Subgroup Results

***ATEV showed superior function and patency in subgroups with historically poor outcomes***

| Females | ATEV (N=37) | AVF (N=33) | p-value | |
|---|---|---|---|---|
| Functional Patency at Month 6 | 89.2% | 54.5% | <0.0001 | |
| Secondary Patency at Month 12 | 81.1% | 48.5% | | |
| | | | Difference | p-value |
| Duration of Use Over First 12 Months | 8.3 months | 5.0 months | 3.3 months | 0.0011 |

| Females, and males with BMI ≥ 30 and diabetes | ATEV (N=56) | AVF (N=54) | p-value | |
|---|---|---|---|---|
| Functional Patency at Month 6 | 85.7% | 51.9% | <0.0001 | |
| Secondary Patency at Month 12 | 76.8% | 46.3% | | |
| | | | Difference | p-value |
| Duration of Use Over First 12 Months | 8.0 months | 4.5 months | 3.5 months | 0.0002 |

# V007 Safety Results in Key Subgroup

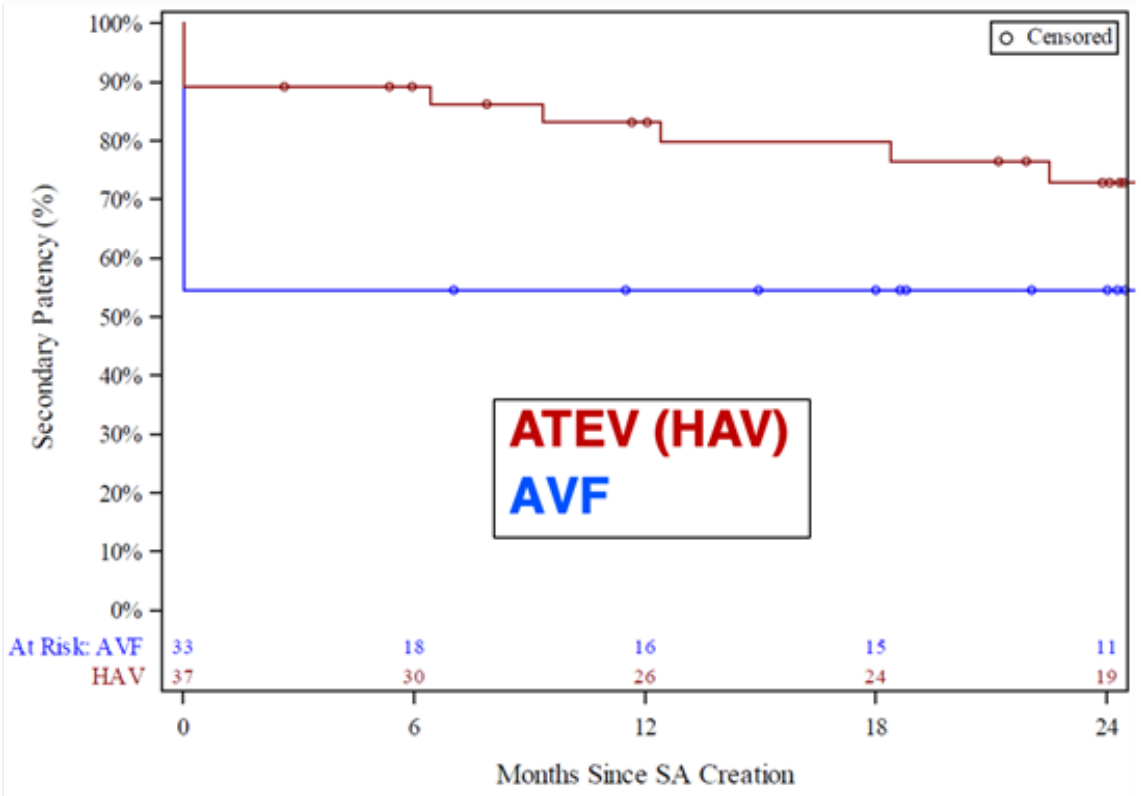
***ATEV has shown no increased safety events per year of usability in the expected target population (all females and males with BMI ≥ 30 kg/m2 and diabetes)***

| 12-Month Safety Summary | ATEV | | AVF | |
|---|---|---|---|---|
| | Subjects (%) n=54 | Events per Patient Year | Subjects (%) n=56 | Events per Patient Year |
| Treatment Emergent Adverse Events | 96.3% | 14.8 | 98.2% | 21.8 |
| Serios Adverse Events | 77.8% | 4.2 | 67.9% | 6.1 |
| Adverse Events of Special Interest: | | | | |
| CEC SA-related infections | 7.4% | 0.1 | 5.5% | 0.1 |
| Thrombosis | 51.9% | 1.2 | 12.5% | 0.3 |
| Stenosis | 64.8% | 3.0 | 51.8% | 2.9 |
| Clinically significant Steal Syndrome | 1.9% | 0.0 | 3.6% | 0.1 |
| Rupture of SA | 0.0% | 0.0 | 3.6% | 0.1 |
| Leading to SA revision or ligation | 11.1% | 0.2 | 28.6% | 1.2 |
| Leading to SA excision | 5.6% | 0.2 | 3.6% | 0.1 |

# V007 Two-Year Results in Female Patients

***ATEV has shown superior long-term patency at 24 months in females, and in all females and males with BMI ≥ 30 kg/m2 and diabetes***

## Higher 2-Yr Secondary Patency with ATEV in Females



# V012 (HUMAXX) Trial in Women Dialysis Patients

Trial comparing Humacyte's (ATEV™) to AVF in women

**To Compare the Efficacy and Safety of the ATEV With AVF in Female Patients With End-Stage Renal Disease Requiring Hemodialysis (HUMAXX)**

Female patients currently receiving hemodialysis via catheter and who are candidates for creation of an AVF or implantation of an ATEV.

- **Enrollment:**
- Target 150 total subjects (interim analysis after 80 patients)
- 1:1 Prospective randomization ATEV vs. Autogenous fistula

**Objectives:**

- **Primary Efficacy:** Total days free from in-dwelling catheter ("catheter-free days") until 365 days, or until access abandonment, whichever occurs first.
- **Primary Safety:** Number and severity of infections related to all accesses (including catheters) from access creation until 365 days.

**File supplemental BLA based after interim analysis of V012 study results:**
**Planned supplemental BLA filling in 2nd half of 2026**

**Target subgroups in which the ATEV showed the best results in the V007 study:**
**All females, and potentially males with one or more risk factors**

# Peripheral Arterial Disease (PAD)

Humacyte®

# Peripheral Artery Disease (PAD)

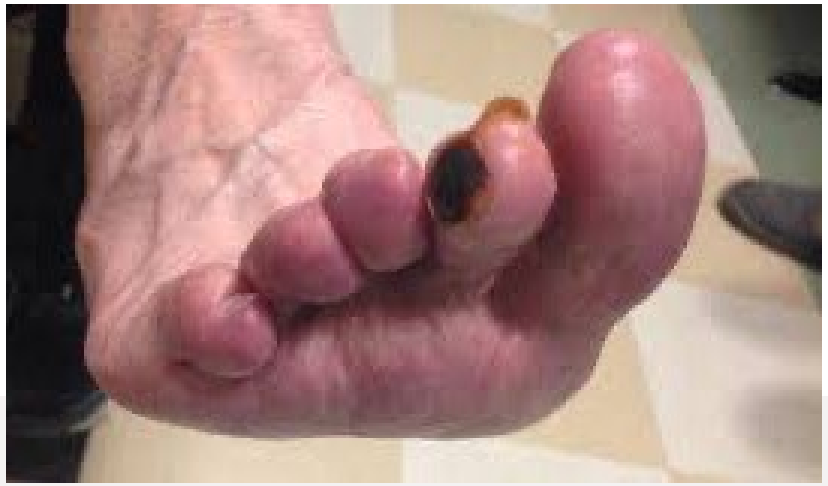
**Can progress to multiple leg arteries, further reducing circulation**

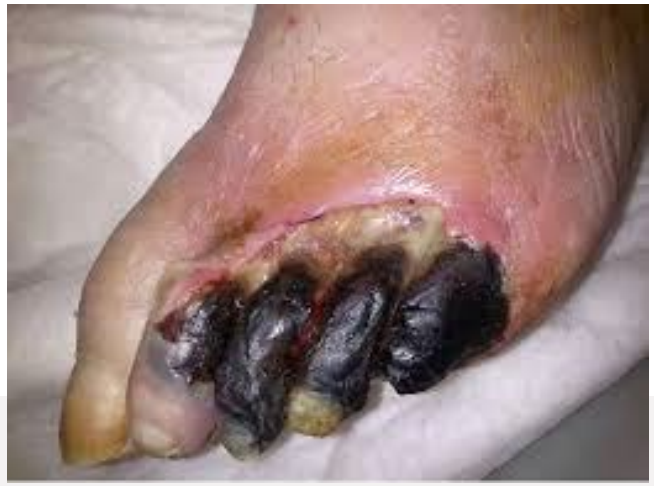
## Critical Limb Threatening Ischemia

- Tissue does not receive enough blood flow to survive
- If untreated, leads to tissue loss, gangrene, and ultimately amputation

## Treatment Requires Restoration of Blood Flow

- Non-surgical, catheter-based intervention
- Surgical bypass





For the 40% of PAD patients who do not have an ipsilateral saphenous vein for arterial bypass, ATEV may represent a promising means of revascularization and limb salvage

Humacyte®



32

# Current Clinical Experience with ATEV in Peripheral Arterial Disease

**Phase 2 Trials**

- V002 – 20 patients (EU)
- V004 – 15 patients (US)

**EA**

Over 20 U.S. patients with critical limb ischemia treated under FDA Expanded Access program

**Mayo IND**

Investigator-sponsored IND

- 29 patients with severe PAD at risk of limb loss
- Patients did no have saphenous vein available

- Six-year results from V002 published in *Journal of Vascular Surgery – Vascular Science*[1]
- Publication of First Eight Expanded Access Cases in *Annals of Vascular Surgery*[2]
- Outcomes published in *Midwestern Vascular Surgical Society* showing 86% limb salvage rate

[1]Piotr Gutowski, et al, 6-Year Outcomes of a Phase 2 Study of Human-Tissue Engineered Blood Vessels for Peripheral Arterial Bypass, JVS: Vascular Science (2023)

[2]Lauria A, Kersey A, Propper B, et al. *Annals of Vascular Surgery*. 2022 Apr 6:S0890-5096(22)00180-7



Humacyte®

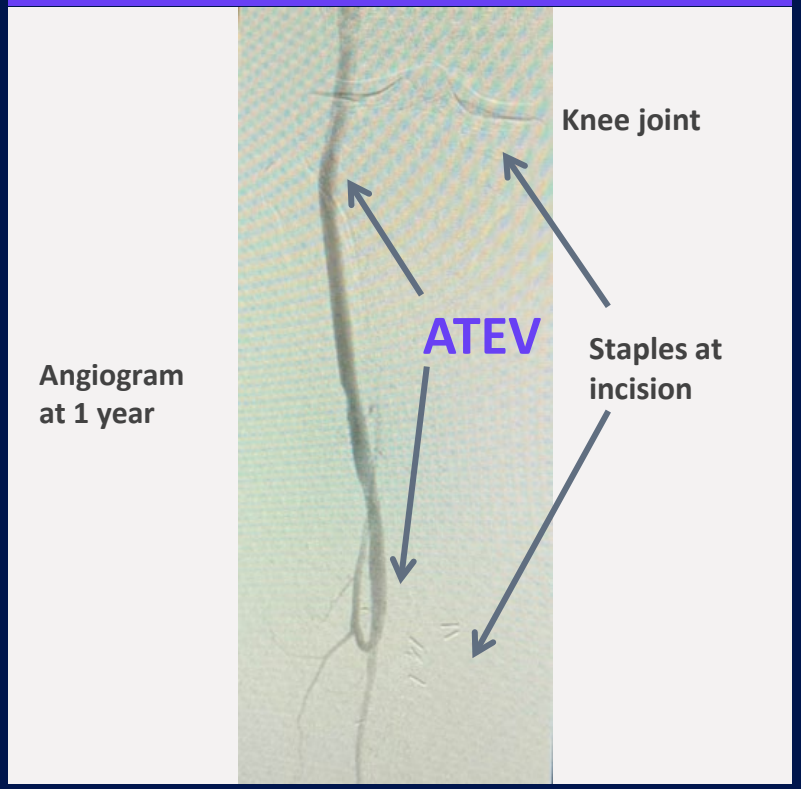
# Expanded Access: Restoring Mobility with ATEV

- The ATEV was used under compassionate use program in 70-year-old patient with severe vascular disease
- No vein was available to perform a bypass, as the vein was previously harvested for a CABG
- A right distal superficial femoral artery-to-peroneal artery bypass was performed using an ATEV
- The patient's postoperative course was unremarkable
- At 1-year follow-up the angiography showed a patent ATEV without significant stenosis at the distal anastomosis
- **Four years after ATEV implantation, the patient continues to do well and is walking.**

VESS Vascular & Endovascular Surgery Society

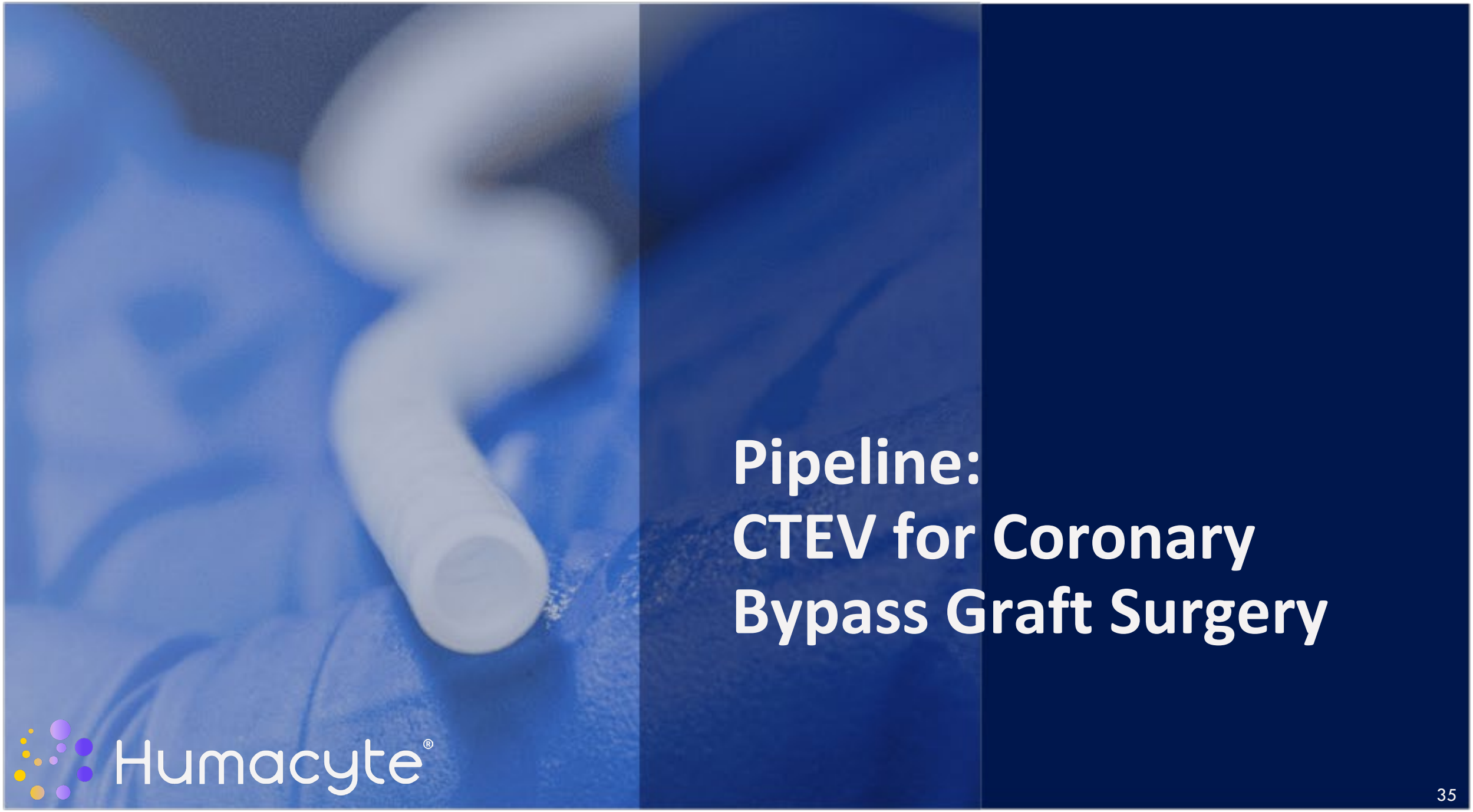
This case was included in ATEV results in critical limb ischemia presented at VESS meeting in January 2022

**Bypass performed using the ATEV in patient with severe vascular disease**





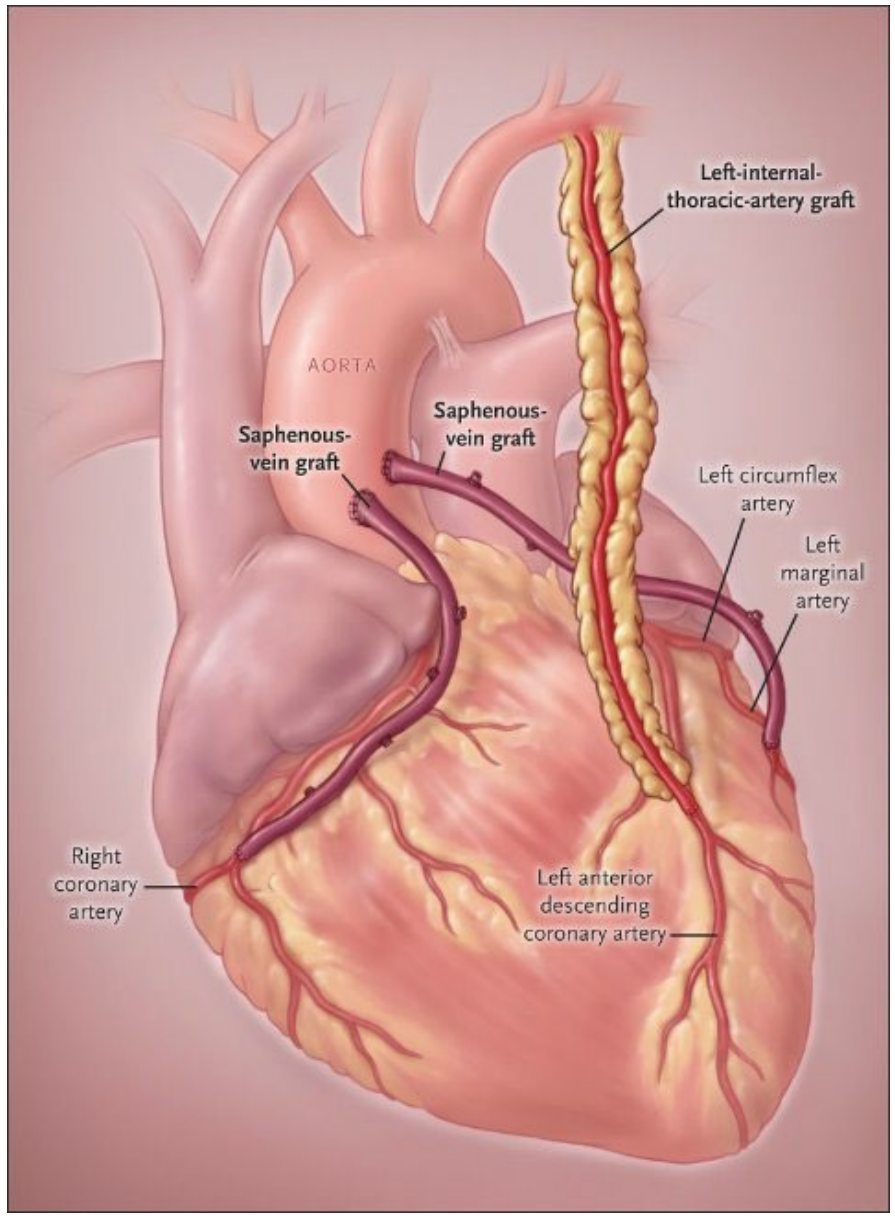

Humacyte®



# Pipeline: CTEV for Coronary Bypass Graft Surgery

Humacyte®

# Coronary Artery Bypass Grafting (CABG)




## Introduction

- The most commonly performed cardiac surgical procedure in the U.S. (approx. 300,000 per year)
- In the United States, 79 people per 100,000 have triple bypass surgery each year.
- CABG is generally recommended when there are high-grade blockages in any of the major coronary arteries and/or percutaneous coronary intervention (PCI) has failed to clear the blockages

## Most commonly used autologous grafts

- **Left internal mammary artery (LIMA)**
  - Most often used to bypass Left Anterior Descending (LAD) Artery
  - >90% patency at 10 years
- **Saphenous vein graft (SVG)**
  - Often used to bypass Right Coronary Artery (RCA) or Left Circumflex Artery
  - SVGs used in 80-90% of CABG procedures
  - 10%-25% failure rate at 1 year, 40%-50% failure rate at 10 years
- Radial artery and other arm veins

# Concerns with Saphenous Vein Grafts

Humacyte®

## Vein Quality Issues

- Varicosities (20-30% of patients)
- Previous vein stripping or ablation
- Small diameter (<3mm)
- Sclerotic or diseased veins
- Peripheral vascular disease effects

## Harvest-Related Morbidity

- Wound complications (5-10%)
- Leg edema and pain
- Infection risk
- Nerve injury (saphenous nerve)
- Prolonged recovery time

## Medical Co-morbidities

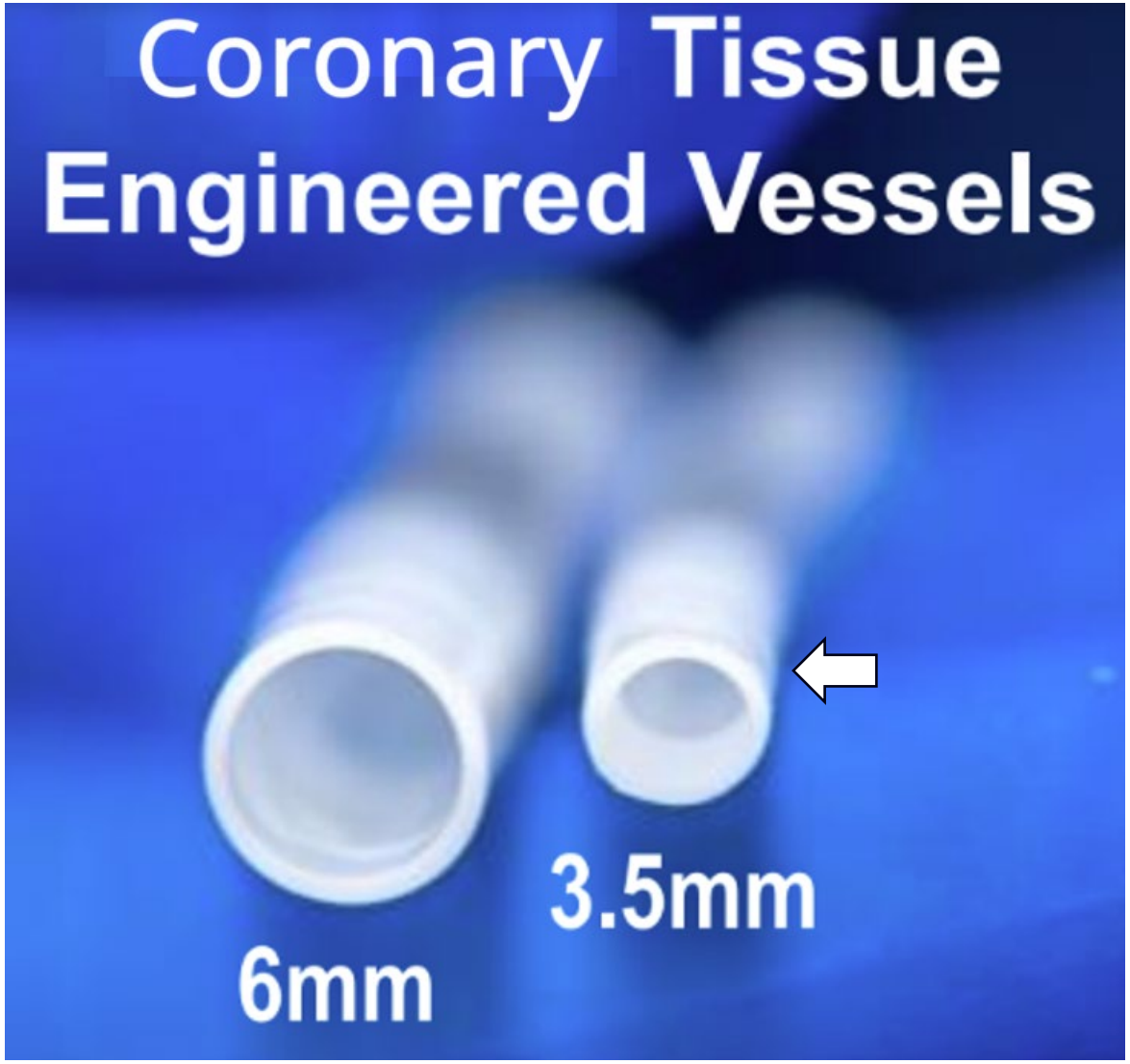
- Bilateral leg amputations
- Need to preserve vein for future peripheral bypass
- Prior vein harvest for CABG or peripheral surgery
- Obesity (difficult harvest)
- Patients with diabetes (higher failure rates)

## Long-Term Clinical Impact

- Need for repeat revascularization
- Recurrent angina (20-30% at 5 years)
- Risk of graft atherosclerosis
- Reduced event-free survival
- Higher healthcare costs


- Zenati MA et al. N Engl J Med. 2019;380:2069-77
- Hess CN et al. Circulation. 2014;130:815-27
- Lopes RD et al. JAMA. 2012;307:265-74

# Coronary Tissue Engineered Vessel (CTEV): Addressing an Unmet Need in Multivessel CABG

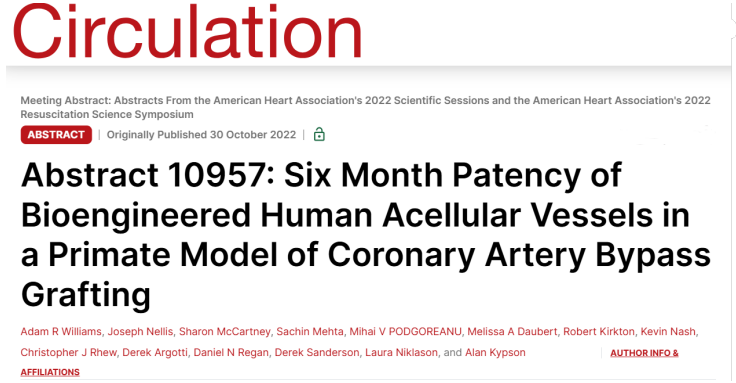


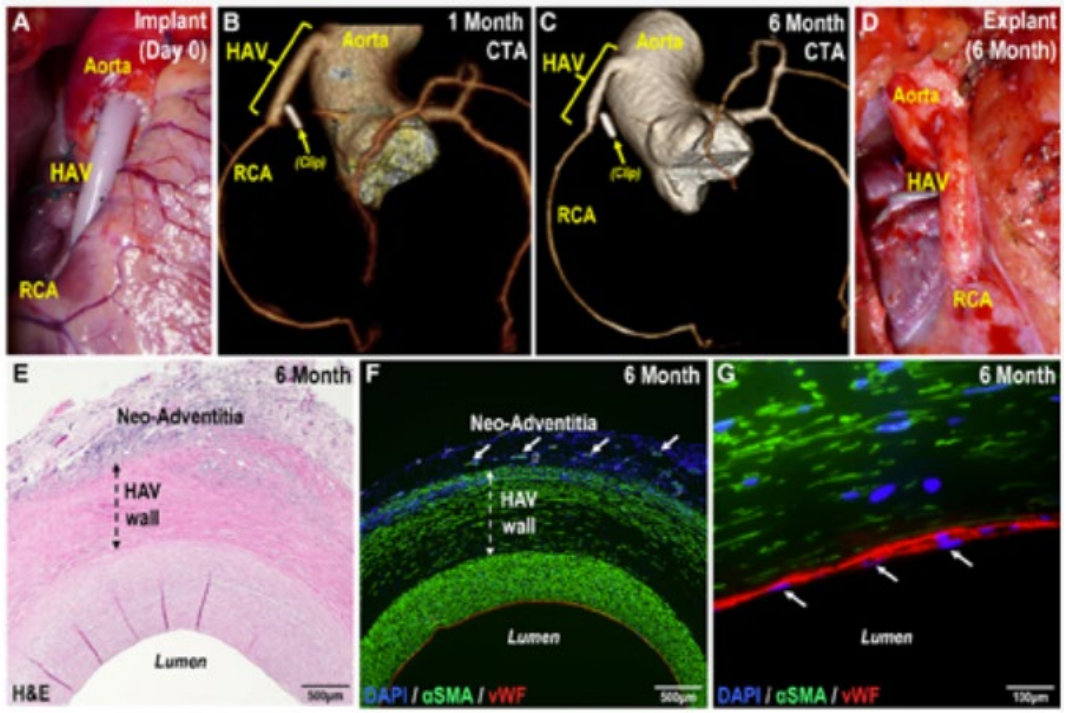

- The CTEV is a first-of-its-kind, sterile, off-the-shelf human-derived vessel that requires no preparation, is non-immunogenic, and resists infection.
- The CTEV has an inner diameter of 3.5 mm and is approximately 23 cm in length.
- It can address unmet conduit needs in CABG patients lacking autologous options, offering patency and durability comparable to or better than saphenous vein without the need for harvesting.
- First human study of CTEV planned for 2nd Half 2026.

Humacyte®

# Early Animal Models Demonstrate Successful Efficacy

Humacyte®




Three primates were successfully bypassed with a 3.5 mm CTEV as aorta-Right Coronary Artery CABG conduits.

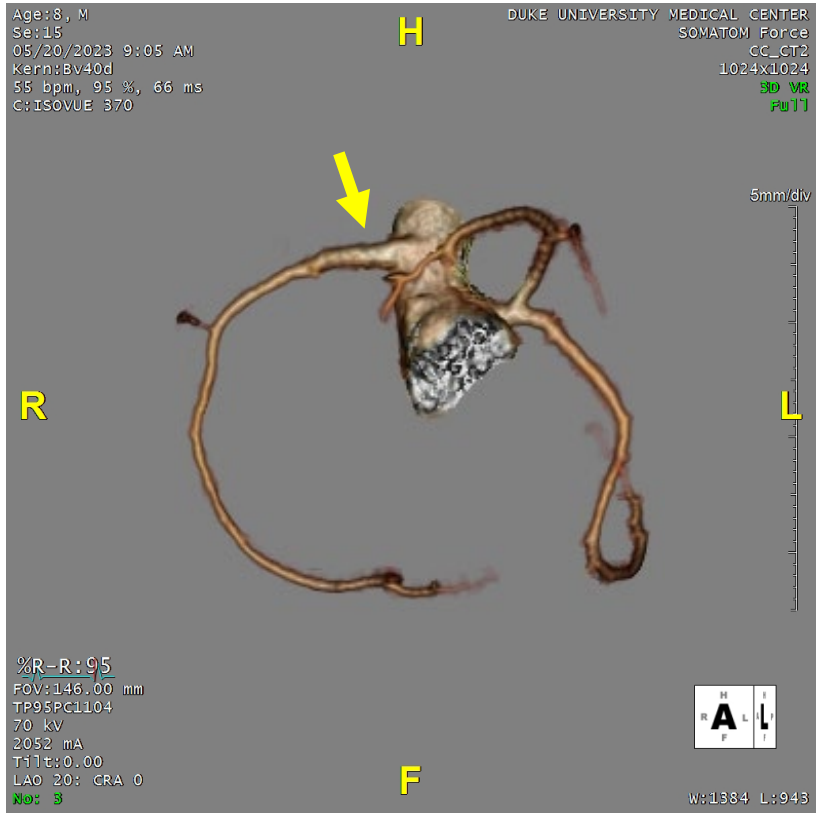
CTA at 1, 3 and 6 months demonstrated patency of the CTEV with no significant stenosis or dilatation.

There were no CTEV-related adverse events for the duration of the study.

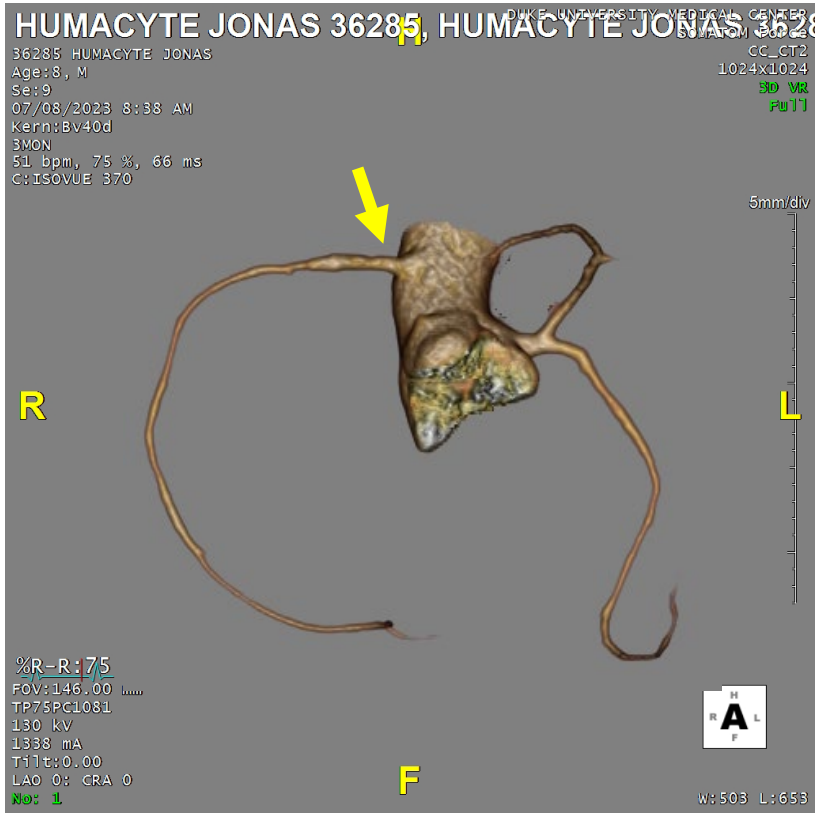
Histological staining of 6-month explanted tissues showed recellularization and remodeling of the CTEV.

# Primate – CABG Angiography – Adaptive Remodeling

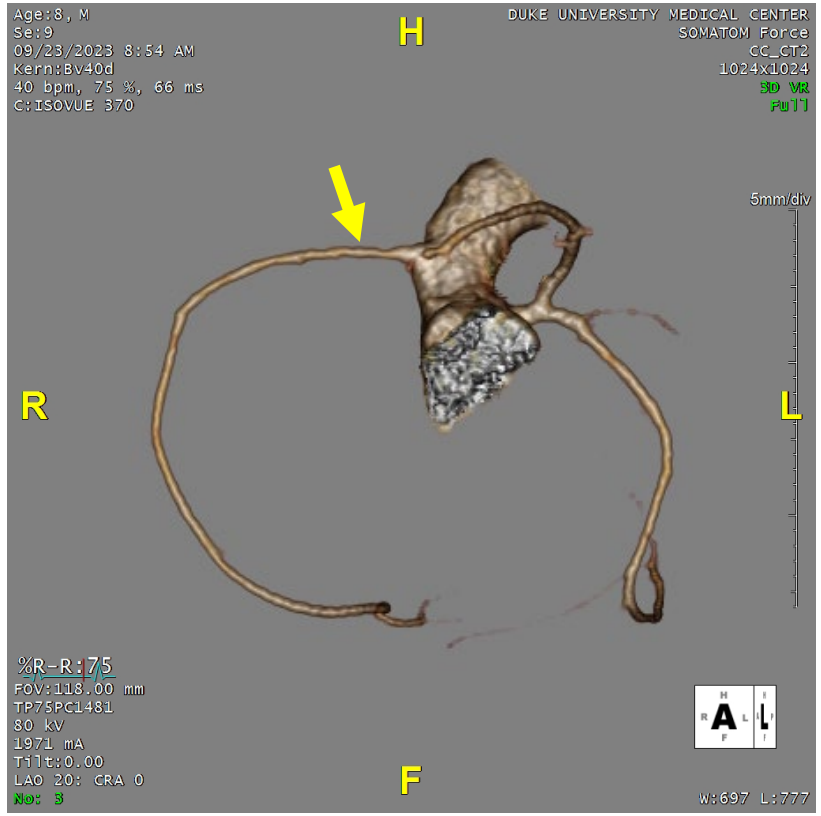
## 1 Month




## 3 Months




## 6 Months




| Jonas – Left Ventricular Function (%) | | | |
|---|---|---|---|
| Pre-Op | 1-Month | 3-Month | 6-Month |
| 70% | 73% | 74% | 73% |

# Pipeline:
# BioVascular Pancreas

Humacyte®

# The BioVascular Pancreas (BVP)

***The BVP is an innovative implantable device designed to deliver pancreatic islets, for treating Type 1 Diabetes (T1D)***

- Core Components: Combines Humacyte's FDA-approved Acellular Tissue-Engineered Vessel (ATEV) with a fibrin-based hydrogel "sleeve" populated with islets.

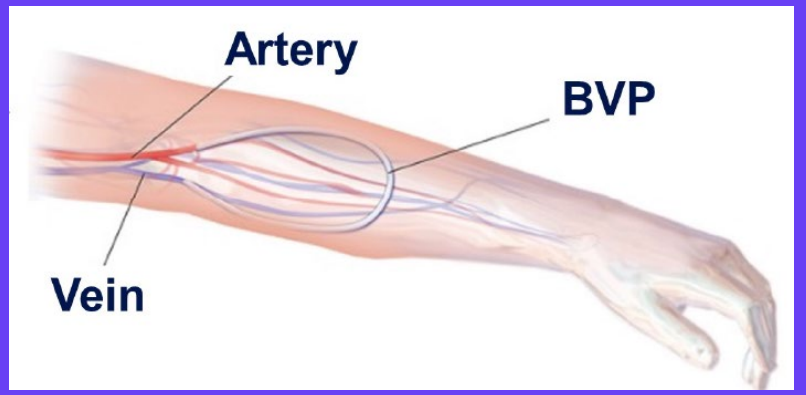
- Mechanism: The ATEV hydrogel coating allows islets access to oxygen from arterial blood through the vessel wall without direct blood contact, reducing hypoxia and inflammation.

- Implantation: Deployed as a vascular graft – i.e. as an arteriovenous graft in the arm. After implantation BVP promotes neovascularization and long-term islet survival and function.

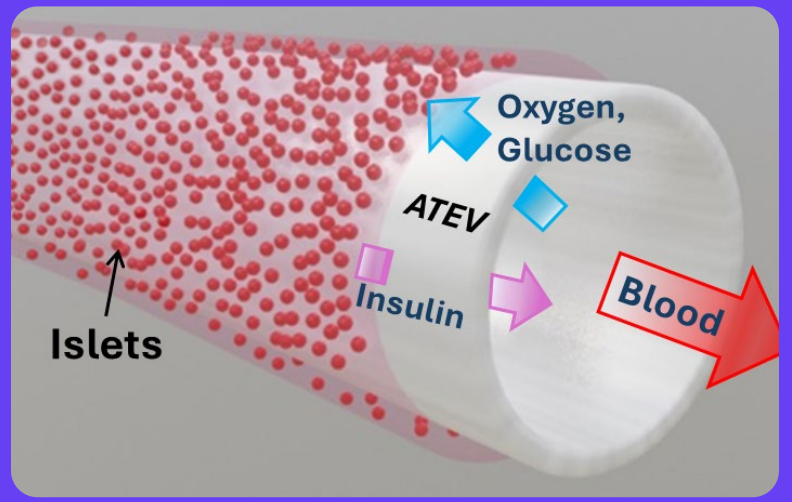
- Development Status: Non-human primate dose range finding studies planned 2026. First in human study planned 2027.

***Developed in collaboration with*** Breakthrough T1D™

**Acellular Tissue Engineered Vessel (ATEV) is implanted in the arm**




**BioVascular Pancreas (BVP)**

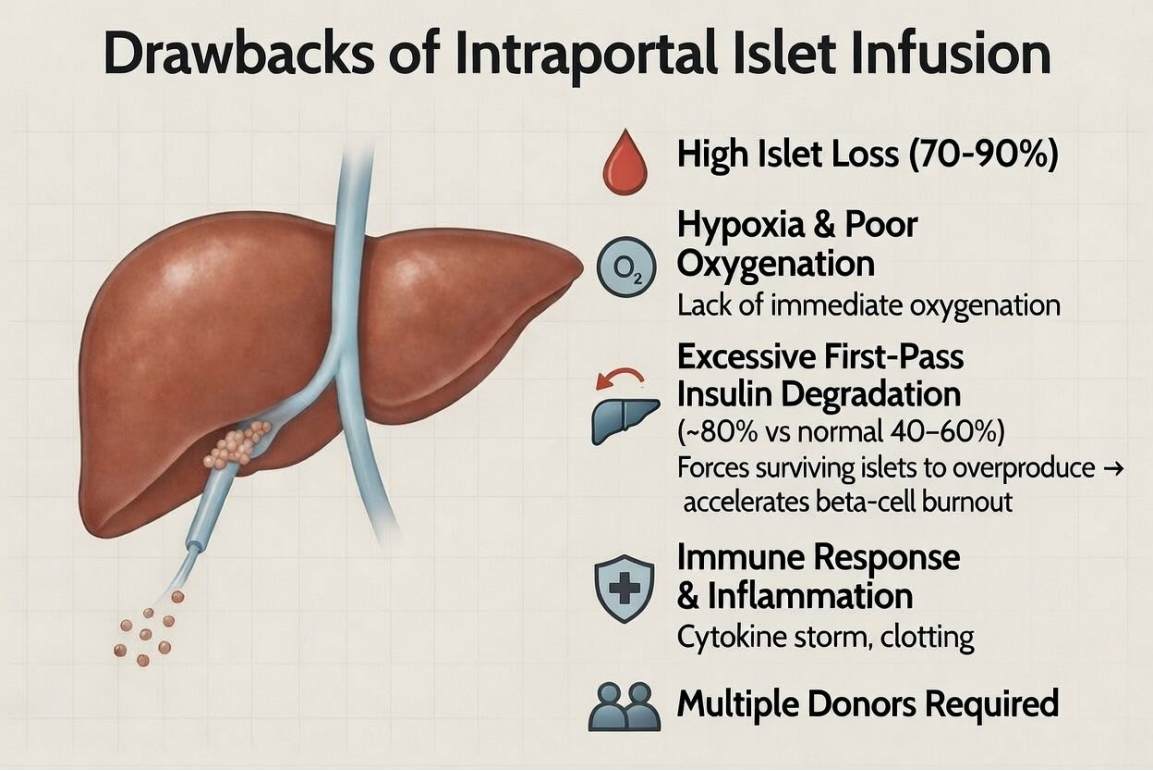


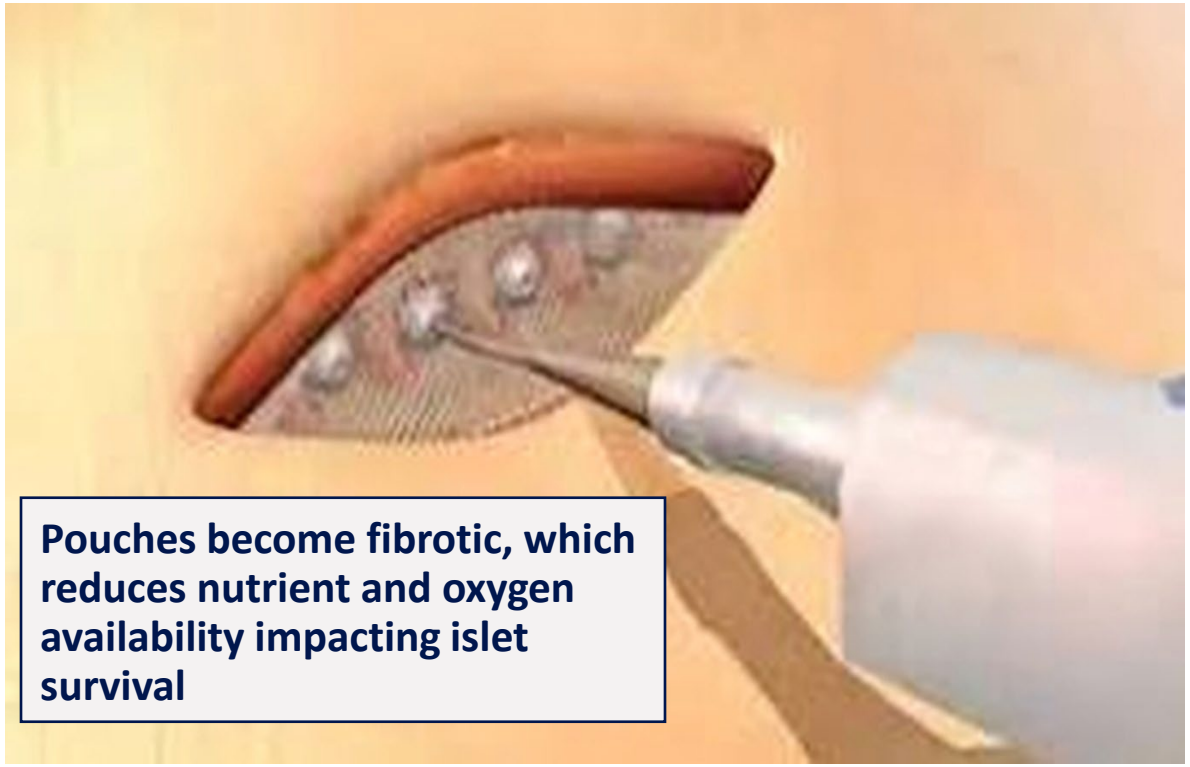
# Drawbacks to Current Islet Transplantation Methods

***Commercial and developmental islet cell transplantation techniques have significant drawbacks impacting cell survival***

***Intraportal Infusion*:** Injecting islets directly into the portal vein for liver engraftment

***Islet Pouch Transplantation*:** create a protected, vascularized environment for transplanted insulin-producing islet cells

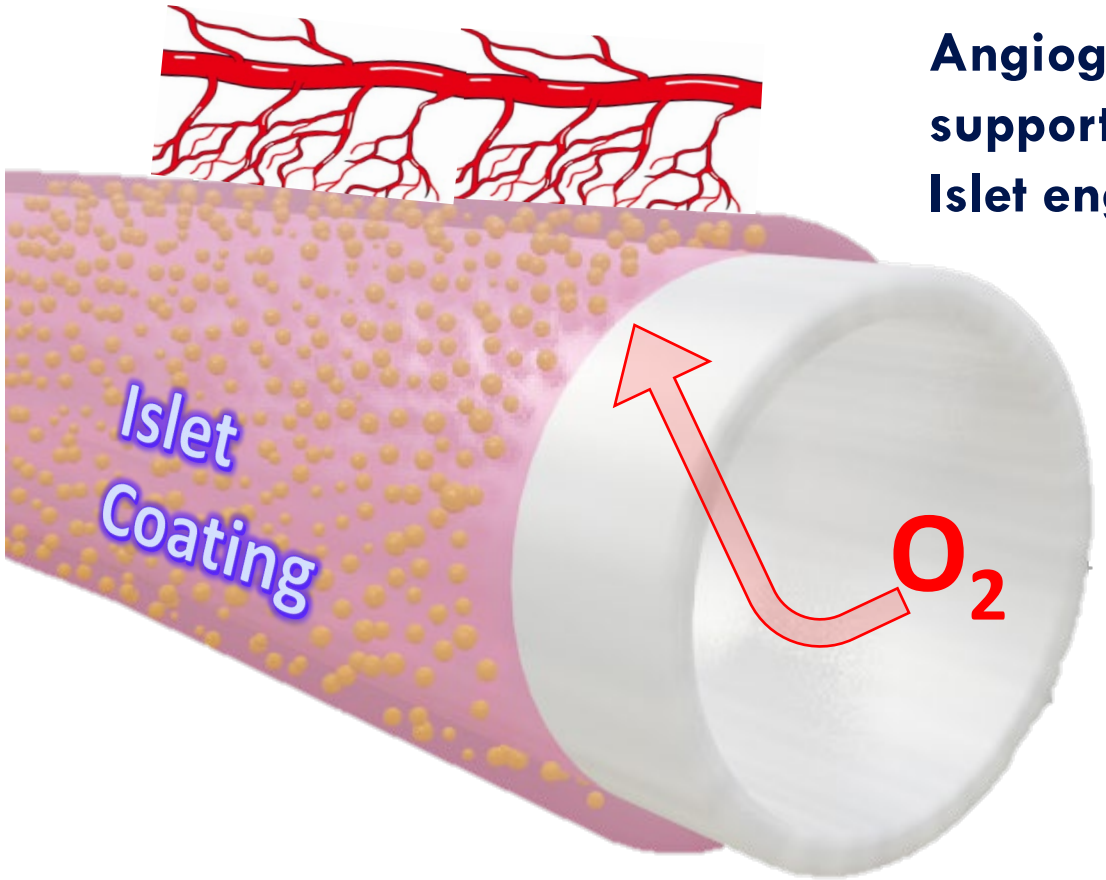


# BioVascular Pancreas Solves the Islet Delivery Problem

Humacyte®

**Islet dosing Uniform and Controlled**




**Angiogenesis supports Long-Term Islet engraftment**

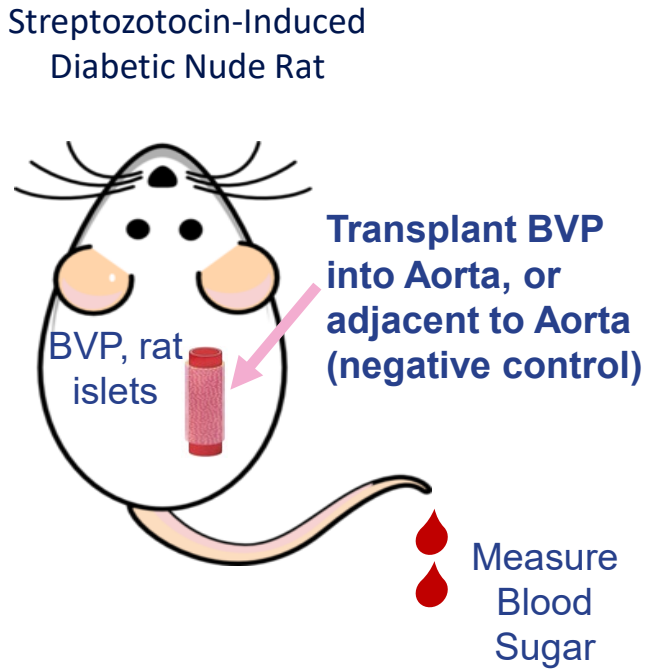
**Avoids excessive first-pass insulin degradation in the liver**

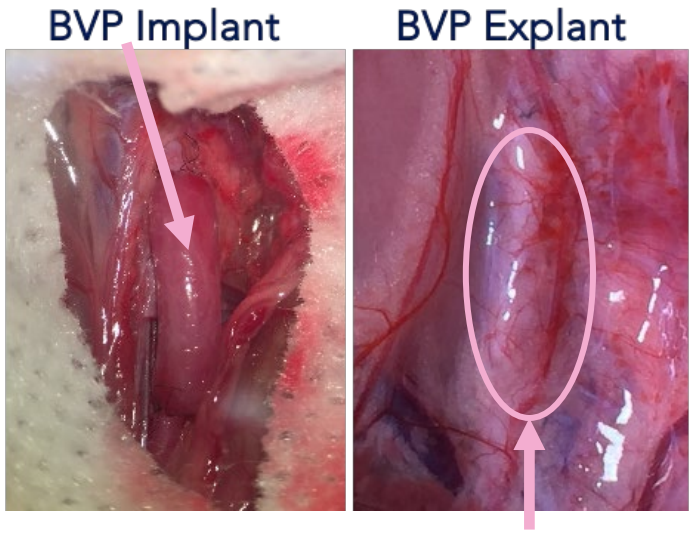
**Immediate and continued Oxygen Delivery to Islets from bloodstream**

## Precision Islet Delivery, while Protecting Islets from Bloodstream Damage

# BVP Proof of Concept in a Rat Model

- Diabetic  rats implanted with BVPs containing rat islets
- Equivalent human ***Islet dosage ~ 350,000*** (fewer than portal vein)
- BVP implanted into the rat aorta, in line with blood flow
- Negative controls received BVP ***adjacent to the aorta***, not in-line with blood flow.
- BVP stimulates angiogenesis/blood flow into islets on outer surface, as seen below:

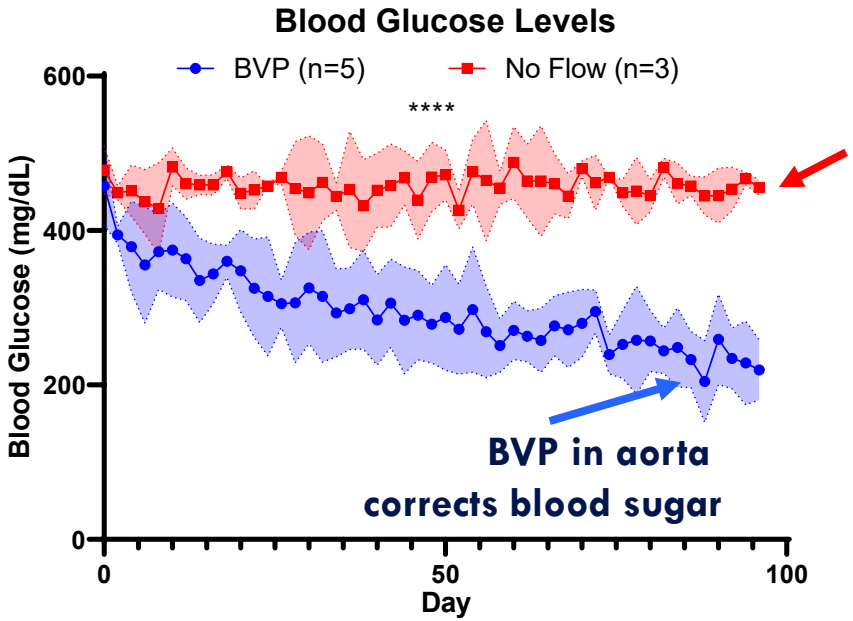


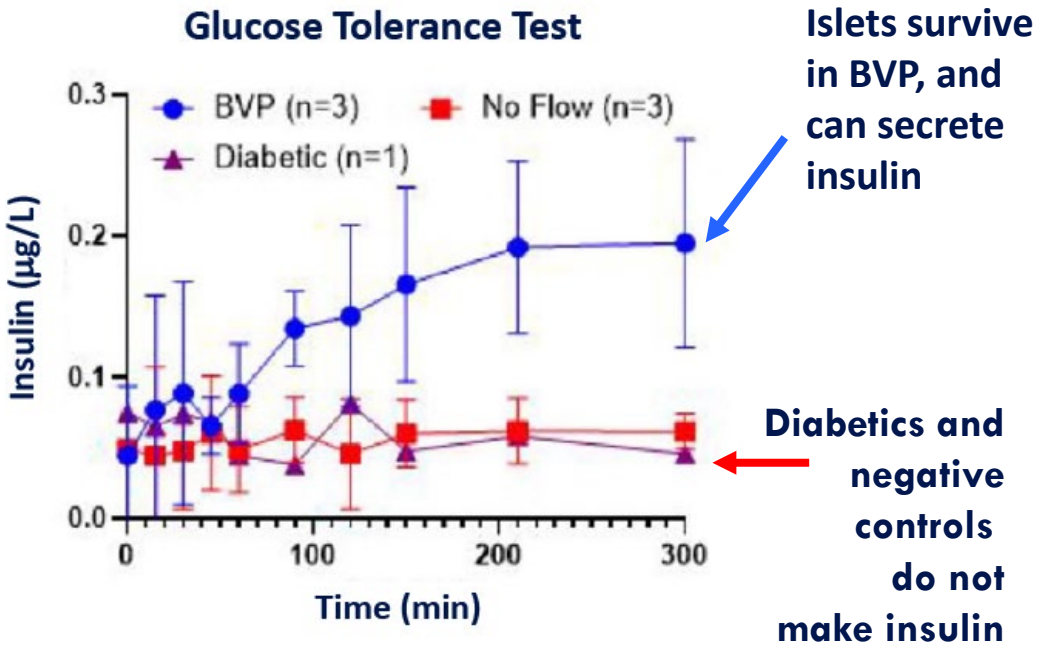




**BVP stimulates small blood vessels that nourish islets after implantation**

# BVP Cures Diabetes in a Rat Model

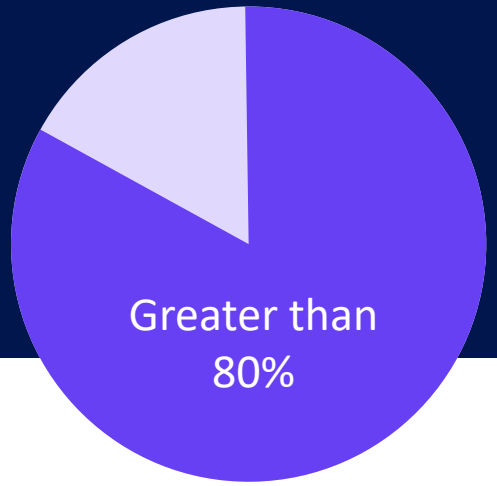
- All animals (n=5) who received BVP in the Aorta were cured of diabetes = ***100% cure rate***.
- BVP implanted just in the abdomen, but not in a blood vessel, failed to cure diabetes.
- Just transplanting islets, without the BVP, does not cure.
- BVP provides cure by supporting islet survival and ability to make insulin in response to glucose challenge.



# BVP NHP Preclinical Data

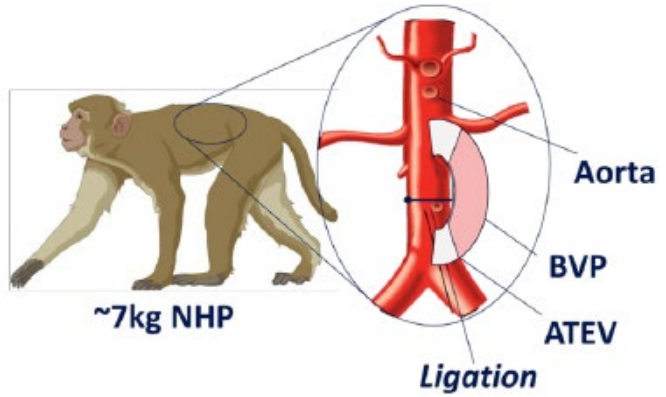
- **BVP Non-Human Primate (NHP) model:  human 6mm ATEV combined with primate islets**
- **Subjects: Cynomolgus macaques weighing 7-8 kg with streptozotocin-induced T1D**
- **Treatment with allogeneic Biovascular Pancreas (BVP) delivering ~3840 islet equivalents/KG supported islet survival for up to 7 months post-implantation**
- **Histology showed healthy and C-peptide-positive islets with few apoptotic cells**

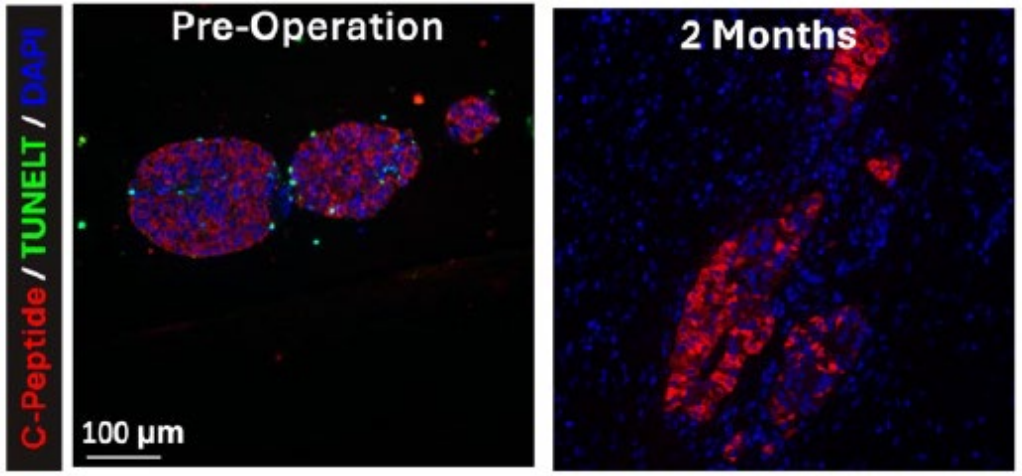


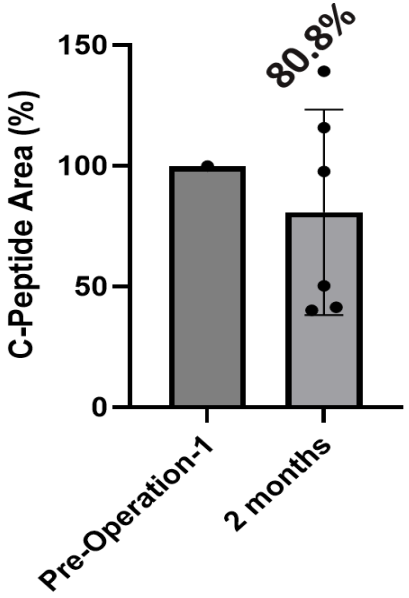

- Greater than 80% islet retention observed at 2 months.
- Significant neovascularization near islets by 7 months
- Functional Outcomes Correlated with detectable plasma C-peptide levels starting at 4 months with reduced needs for exogenous insulin

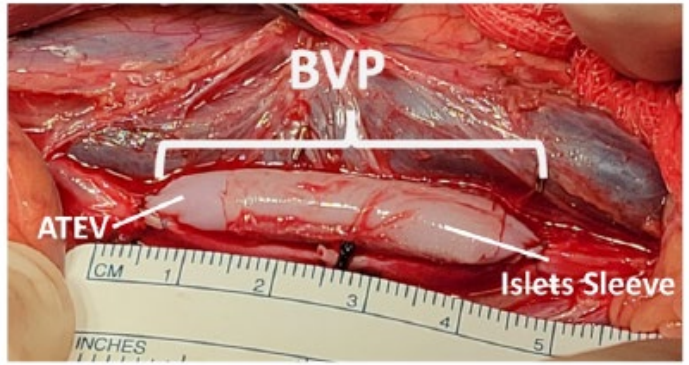
# BVP in non-human primates – Excellent Islet Survival

- Cynomolgus monkeys, 7-8 kg weight
- University of Miami Diabetes Research Center
- Small size → aortic implantation of 6mm human-sized ATEV
- **Animal islet dosing equivalent to 300,000 islets** for a human
- **2-month explant: >80% islet survival**.
- Superior to any known transplant method.



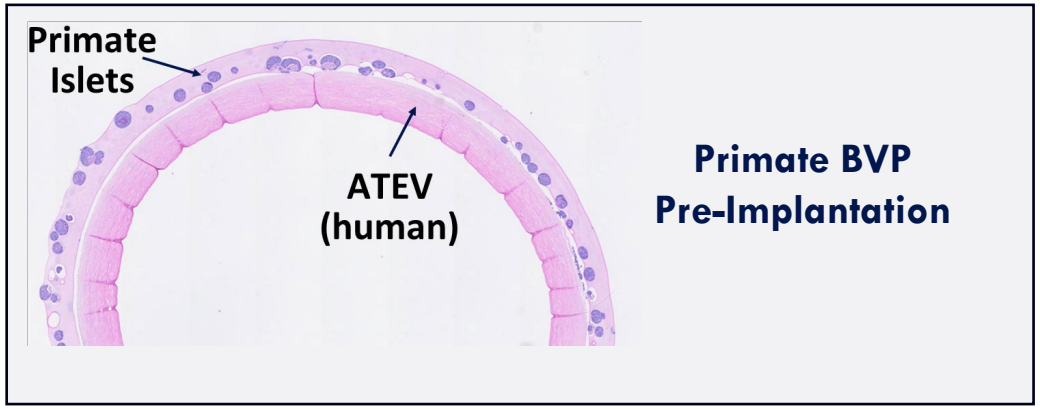



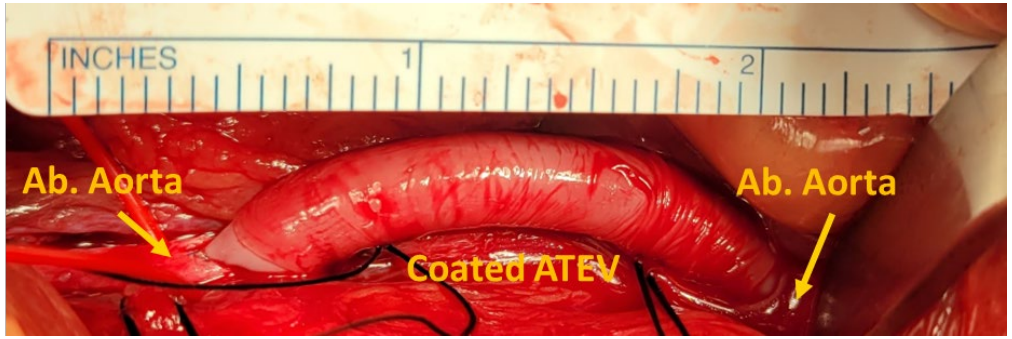



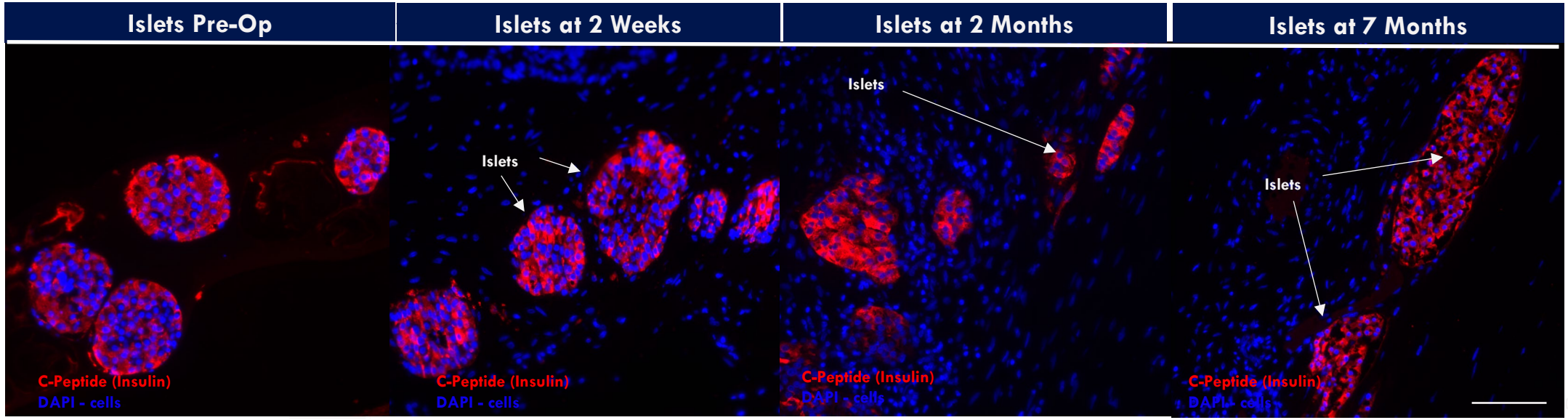
# BVP Supports Long-Term Islet Survival in Primates

*Islets show excellent survival and insulin production for at least 7 months in NHPs.*




Implantation: BVP in aorta of small, non-human primate.



# Milestones

Humacyte®

# Our Technology Addresses Compelling Unmet Needs in Attractive Markets

Humacyte®

Vascular Tissue Constructs

Complex Tissue Constructs and Organ Systems

## Pre-Clinical

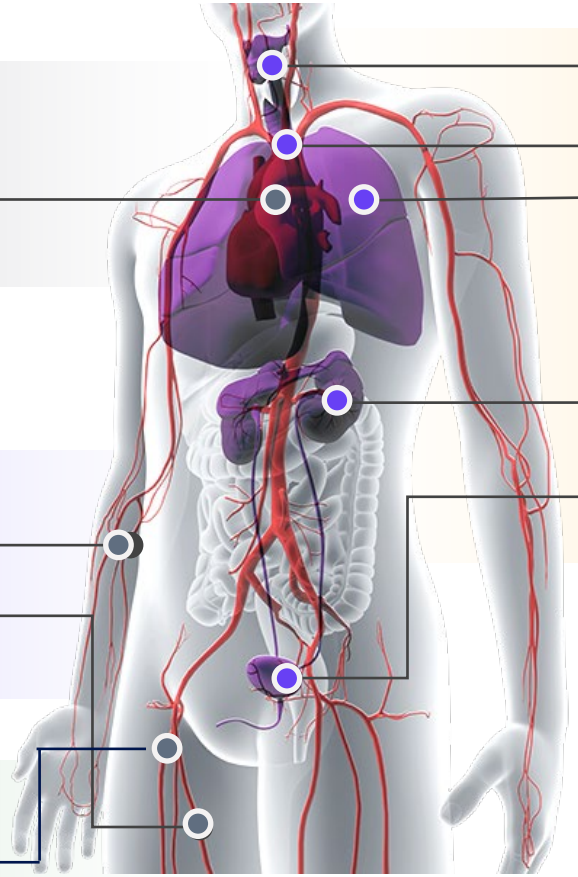
- Coronary Artery Bypass Graft (CABG)
- BT Shunt

## Clinical Programs

- Dialysis AV Access
- Peripheral Arterial Disease (PAD)

## FDA Approved

- Vascular Trauma



## Pre-Clinical

- Trachea
- Esophagus
- Lung
- Pancreas
- Urinary Conduit

# Commercial Manufacturing Scale – LUNA200 System

**Bioreactor bag**

Each bioreactor bag contains a single polymer mesh scaffold, seeded with banked human cells

**Growth drawer**

10 bioreactor bags per growth drawer; tubing connects to shared nutritive media

**LUNA200 System**

Each LUNA200 can produce 200 ATEVs per batch (or ~1,000 ATEVs annually)

## Commercial 83,000 sq ft Bioprocessing Facility

- Currently operating 8 LUNA200 systems
- Annual capacity expected to exceed 40,000 ATEVs
- Functionally closed system with state-of-the-art process automation




Humacyte®

# Anticipated 2026 Milestones

## *Completed in 2025*

*Vascular Trauma - Symvess:*

- *U.S. commercial launch* ✓
- *Long-term results showing durability of Symvess* ✓

*V007 dialysis positive Phase 3 ATEV two-year results* ✓

*Cardiac Bypass Graft Surgery (CABG) CTEV preclinical results from large-animal studies* ✓

*Preclinical BVP results showing survival and function of islets in large animals* ✓

## Planned for 2026

Vascular Trauma (Symvess):

- U.S. commercial launch growth
- Expansion into international markets

Dialysis (ATEV):

- Publication of V007 Phase 3 results
- Interim results from V012 Phase 3 trial in female patients
- Supplemental BLA filing with FDA

CABG (CTEV):

- Commencement of first-in-human study
- First patient results

BioVascular Pancreas (BVP) for type-1 diabetes:

- Preparation for first human study

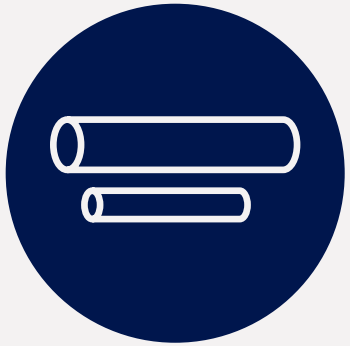
Publications & Presentations
(Multiple other clinical and preclinical publications and presentations expected for 2026)

All milestone dates are only management estimates

# The Promise of Regenerative Medicine

## Bioengineering Platform

Broad platform of universally implantable off-the-shelf bioengineered human tissues and organs



## Extensive Markets

Platform targets extensive markets across multiple indications

## Commercial Scale Manufacturing

Existing facilities expected to support anticipated commercial launch with room for modular expansion



Humacyte®

Humacyte®

# Universally Implantable Regenerative Human Tissue

## Thank You