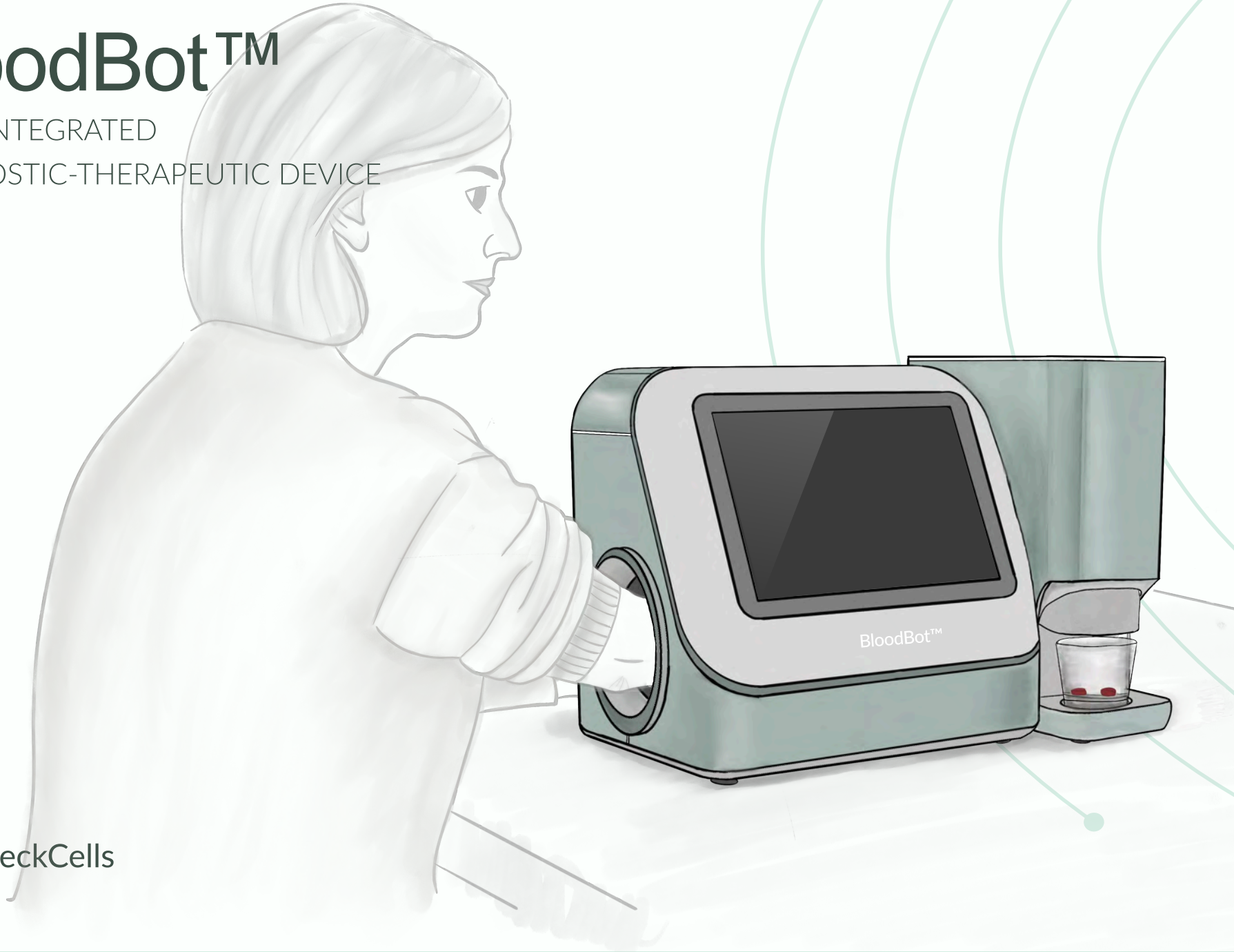
BloodBot™

FULLY INTEGRATED
DIAGNOSTIC-THERAPEUTIC DEVICE



CheckCells

Meet BloodBot™

The world's first Fully Integrated Diagnostic-Therapeutic Ecosystem. By merging autonomous robotic phlebotomy, real-time blood analysis, and smart medication dispensing into one seamless loop, BloodBot™ closes the gap between data and delivery.

- Reduce the time from blood draw to medication adjustment from 48 hours to under 5 minutes.
- Automate high-precision routine tasks to offset nursing and phlebotomy shortages, freeing staff for complex patient care.

> *WE DON'T JUST FIND THE VEIN - WE FIND THE ANSWER. WE DON'T JUST READ THE RESULTS - WE ADJUST THE RECOVERY. FROM THE FIRST STICK TO THE FINAL DOSE - IT IS ALL HERE.*

Features

Minimized Preanalytical Error
Direct transfer from robotic needle to analyzer eliminates contamination, mislabeling, and transport-related degradation.

AI-Guided Robotics
Uses multimodal NIR and ultrasound imaging to locate optimal puncture sites with sub-millimeter accuracy.

Self-Calibrating Biosensors
Pre-sample internal QC before every run to ensure diagnostic-grade accuracy.

Robotic Multi-Med Dispenser
Holds up to 10 medications with automated dose-correction logic.

Vascular Mapping
Differentiates between veins and arteries in real-time using Doppler-enhanced AI to ensure 100% safety protocols.

Microfluidic Shunt
Direct automated transfer from puncture site to internal sensor array, no manual tube handling.

Smart Refill Logistics
Tracks inventory and sends automated alerts to pharmacies and caregivers.

Decision Support Integration
Uses real-time labs and EMR data to recommend or adjust doses.

Your Trusted AI Nurse

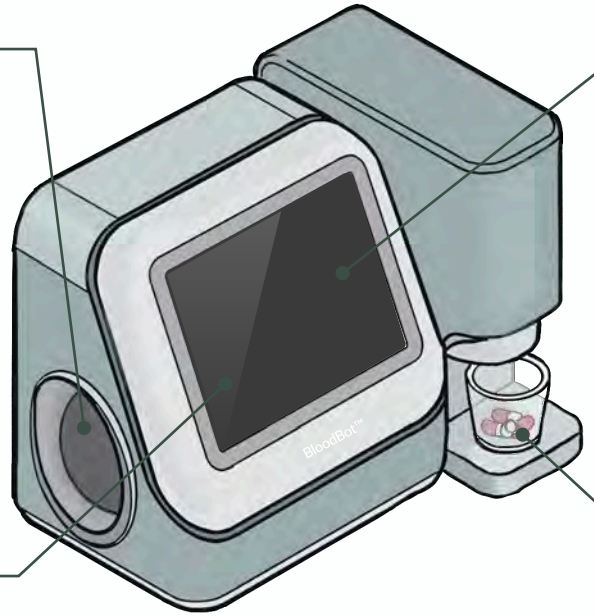
All features are independent and can be deployed in any configuration.

Automated Phlebotomy

BloodBot utilizes advanced vein-mapping technology to perform needle insertion and sample collection with 100% autonomy, ensuring high-quality samples without human intervention.

Clinical Intelligence

Powered by LLM-driven analysis, BloodBot interprets complex blood work to provide personalized treatment suggestions and clinical guidance for providers.



Instant Diagnostics

On-board diagnostics provide lab-grade analysis of Blood Gas, Electrolytes, and Metabolites, delivering results in under 5 minutes for immediate clinical use.

Precision Dispensing

A secure, integrated pharmacy module automates the dispensing of medications and treatments, ensuring the right dose reaches the patient every time.

Sample Collection Process

Precision vein imaging and automated positioning for consistent, high-accuracy blood collection.

Automated Precision

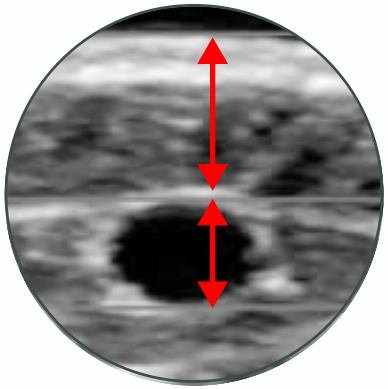
Integrated pressure-cuff technology ensures optimal limb placement and automated 3D alignment.

AI-Guided Imaging

The system combines near-infrared (NIR) imaging and ultrasound to accurately identify suitable veins across all skin tones and body types.

Real-Time Vascular Discrimination

Integrated Doppler ultrasound provides a final safety verification, differentiating arteries from veins and allowing the device to proceed only when a safe puncture site is confirmed.



Vascular Geometry

Automated Morphometric Analysis: Real-Time Venous Depth and Luminal Diameter Measurement

BloodBot™ System

Controlled Aseptic Zone

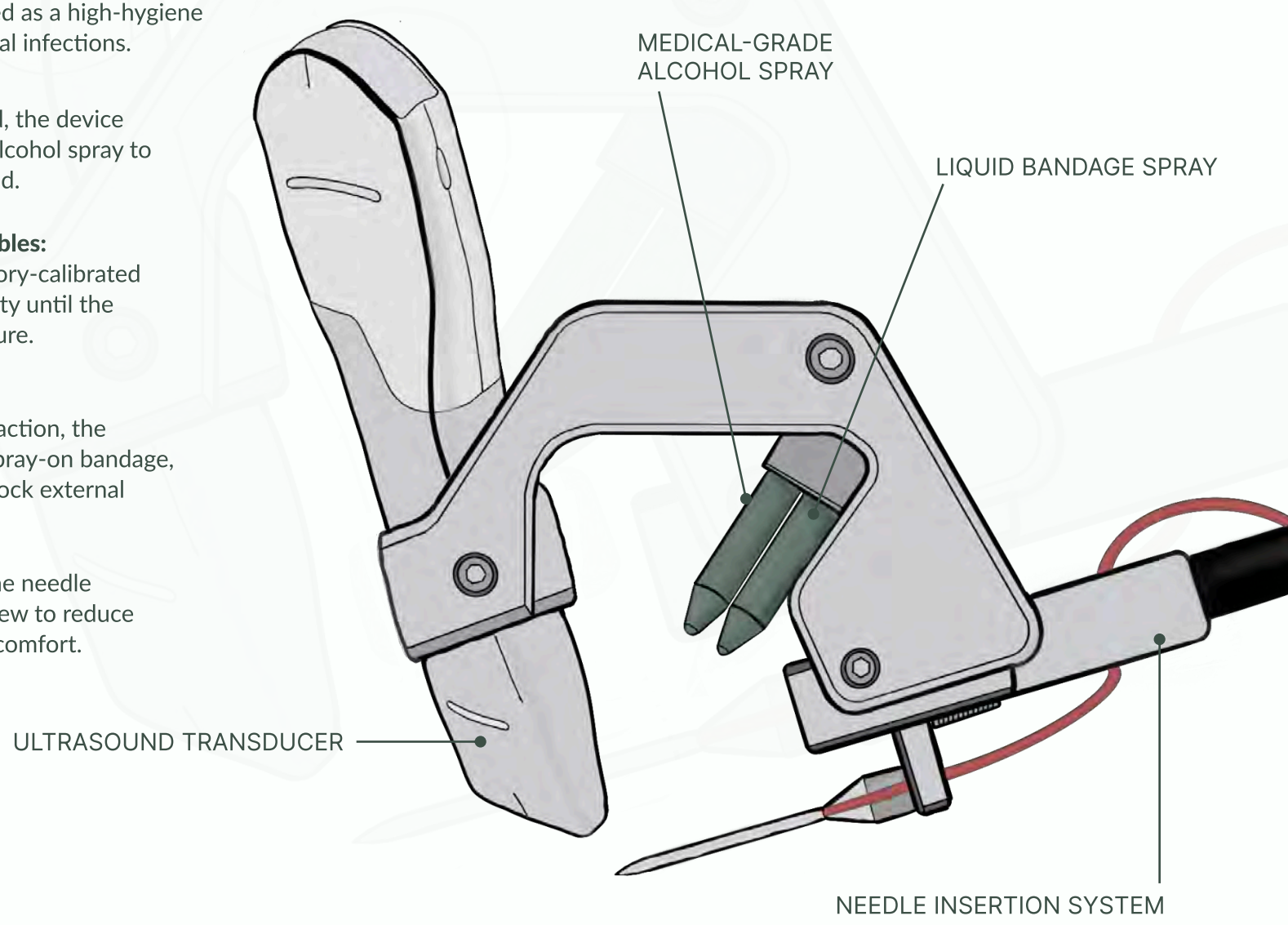
The blood draw area is maintained as a high-hygiene "clean zone" to prevent procedural infections.

- **Automated Sanitization:**
  Before the needle is deployed, the device applies a precision-targeted alcohol spray to the site to ensure a sterile field.

- **Sterility-Preserved Consumables:**
  Every needle cartridge is factory-calibrated and sealed, maintaining sterility until the moment of the robotic puncture.

- **Post-Draw Protection:**
  Immediately after needle retraction, the system applies a protective spray-on bandage, sealing the site instantly to block external contaminants.

- Throughout the procedure, the needle remains fully shielded from view to reduce patient anxiety and enhance comfort.

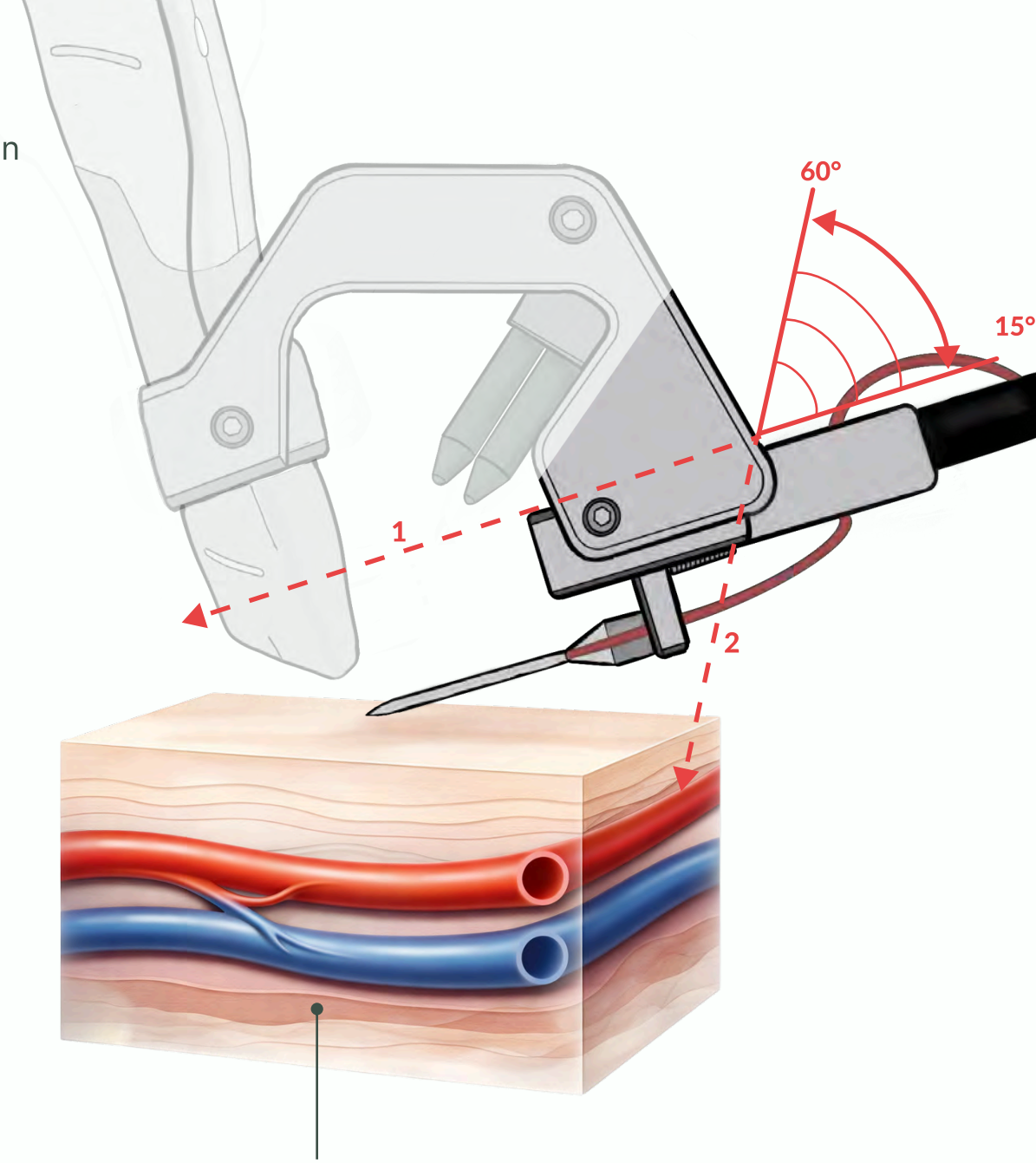


Dual-Purpose Vascular Access: High-Precision Needle Draw or Cannula Administration

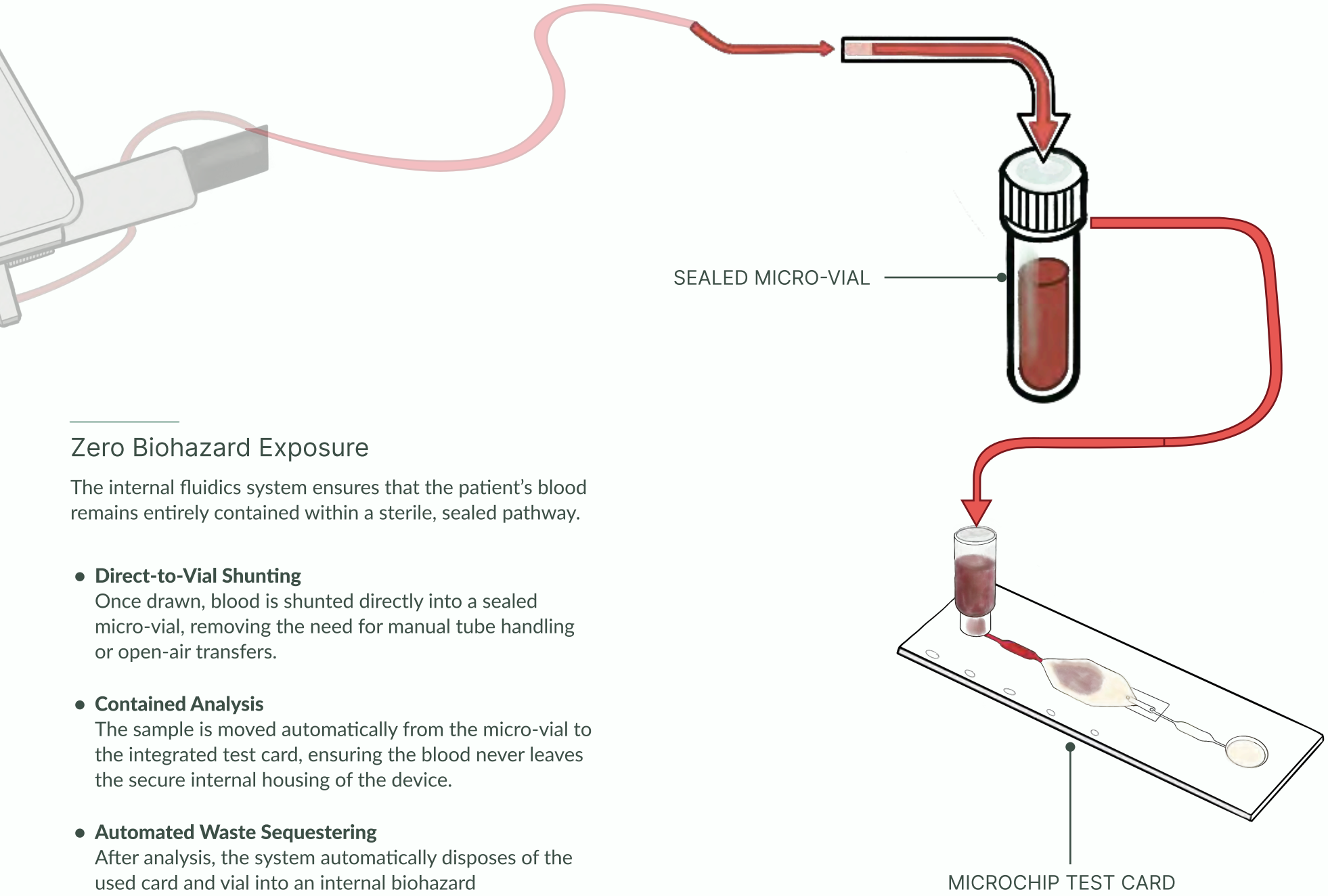
The system is engineered for total procedural versatility, accommodating either a precision needle for **fully automated blood collection or a high-performance cannula for medication delivery.** Our "Engineering Intuition" allows the robotic system to do more than just insert; it mimics the sensory perception and delicate touch of a veteran phlebotomist.

- **Human-Mimetic Movement**
  The device combines machine consistency with expert clinical intuition by replicating the professional "steep-to-flat" transition. Based on real-time VLA depth data, **the system initiates an optimized entry vector, ranging from 15°(1) and 60°(2) and then automatically flattens the approach angle** immediately upon venipuncture.

- **Precision & Safety**
  This human-mimetic advancement ensures that the needle or catheter is seated securely within the vessel lumen. By neutralizing the angle after the initial flashback, the device safely advances deep into the vein, maximizing intravascular stability while effectively preventing through-puncture or transfixion.



Powered by Doppler-enhanced AI, the system distinguishes arteries from veins with sub-millimeter accuracy, allowing for selective arterial aspiration with 100% protocol adherence



Zero Biohazard Exposure

The internal fluidics system ensures that the patient's blood remains entirely contained within a sterile, sealed pathway.

- **Direct-to-Vial Shunting**
  Once drawn, blood is shunted directly into a sealed micro-vial, removing the need for manual tube handling or open-air transfers.

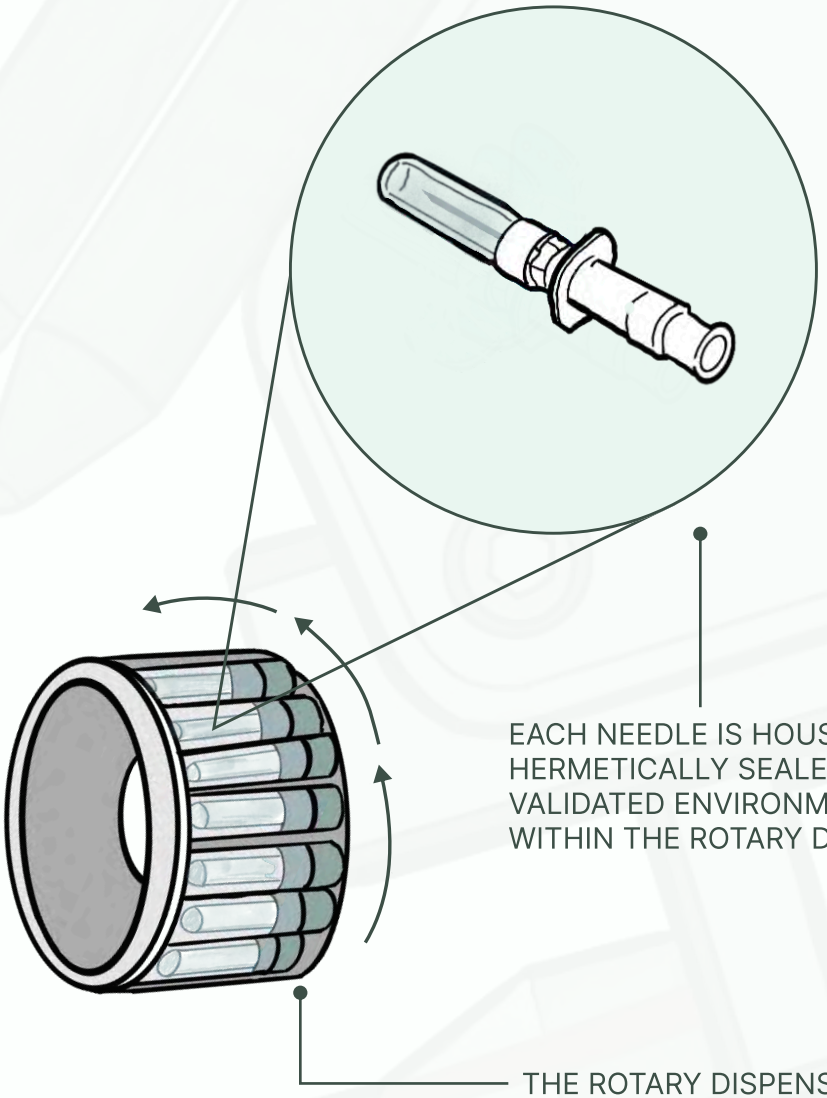
- **Contained Analysis**
  The sample is moved automatically from the micro-vial to the integrated test card, ensuring the blood never leaves the secure internal housing of the device.

- **Automated Waste Sequestering**
  After analysis, the system automatically disposes of the used card and vial into an internal biohazard compartment, requiring zero manual cleanup.

Zero-Contact Needle

The BloodBot™ platform utilizes a fully autonomous, zero-contact needle exchange system to ensure 100% sterility and eliminate the risk of needlestick injuries. The process is designed to be invisible to the patient and effortless for the clinician.

- **Zero Human Contact**
  Eliminates the risk of accidental needle-sticks for both staff and patients.
- **Standardized Sterility**
  Guarantees a fresh, high-precision needle for every single procedure. The clinician selects the required gauge via the digital interface.
- **Total Traceability**
  Automatically links the specific needle data directly to the patient's EMR for audit trails.
- **Auto-Retraction:**
  Post-procedure, the needle is automatically retracted into a dedicated Biohazard Internal Chamber, ensuring zero exposure.



*High-torque stepper motor ensures needle insertion depth accuracy within ±0.5mm.

*Compatible with standard ISO-compliant needles ranging from 21G to 30G.

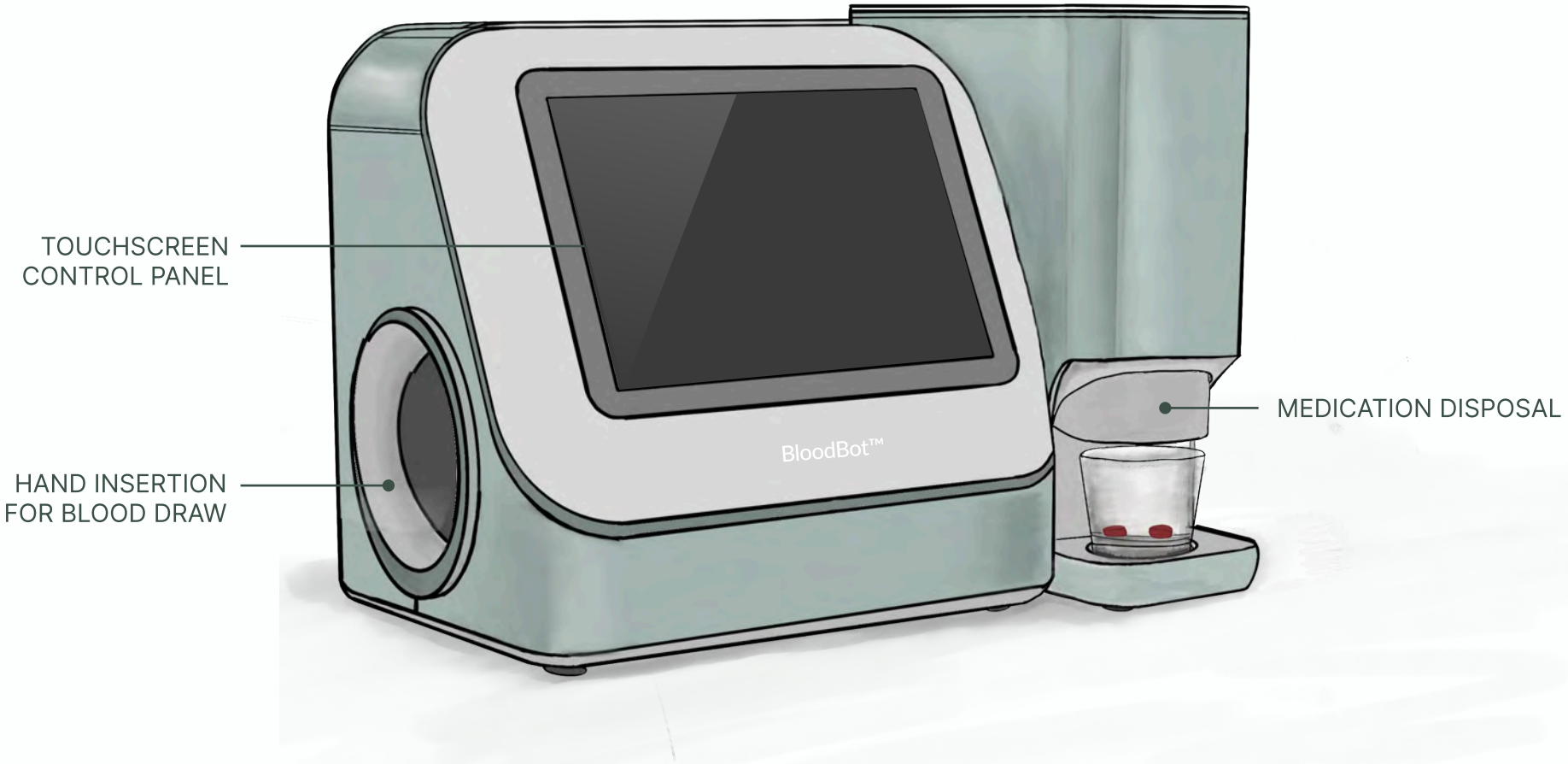
*Meets and exceeds OSHA Bloodborne Pathogens Standard (29 CFR 1910.1030) for sharps injury prevention.

Integrated Diagnostic Intelligence

The BloodBot™ platform utilizes a single integrated microchip test card to deliver a comprehensive metabolic and respiratory profile. The device returns **13 measured analytes and 18 calculated values** with laboratory-level precision directly at the point of care.

BloodBot™ Blood Panel: Measured Analytes & Clinical Precision

Analyte Group	Measured Markers	Accuracy
Blood Gases	pH, pCO_2, pO_2	pH: 0.07%–0.13% CV; pO_2: R=0.996 compared to GEM4000
Electrolytes	Na^+, K^+, Ca^{2+}, Cl^-	K^+: R=0.996 compared to iSTAT; Na^+: R=0.920
Metabolites	Glucose, Lactate, BUN, Creatinine	Glucose: R=0.990; Creatinine: correlation R=0.93–1.04
Hematology	Hematocrit (Hct)	Hct: R=0.916 compared to HemataSTAT-II



The BloodBot™ Advantage: Beyond Single-Function Robotics

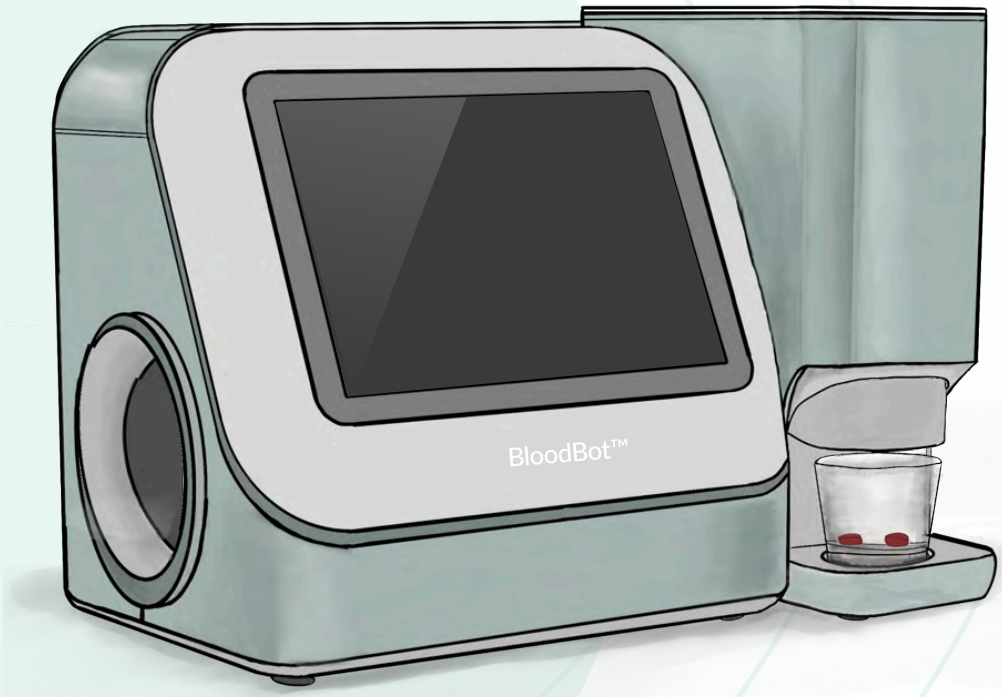
BloodBot™ exceed the limitations of single-function devices by creating a unified "Clinical Loop." While competitors focus on a single piece of the puzzle, **BloodBot™ owns the entire patient interaction.**

Capability	BloodBot™	Vitestro (Aletta)	Veebot Systems	Abbott (i-STAT)
Autonomous Blood Draw	☑	☑	☑	✗ (Manual)
Instant Bedside Analysis	☑	✗	✗	☑
Automated Medication Dose	☑	✗	✗	✗
Zero Biohazard/Sharps Risk	☑	✗	✗	✗

BloodBot™ is the only autonomous platform that unifies the draw, the lab, and the dose into one "Closed-Loop" bedside interaction.

CheckCells

The Future of Autonomous Vascular Access



Our mission is to bridge the gap between robotic consistency and human intuition. By integrating multimodal AI-guidance with biomimetic motion, we provide a standard of care that eliminates error and maximizes patient comfort

Contact Us

Website: **www.checkcells.com**
Email: **contact@checkcells.com**