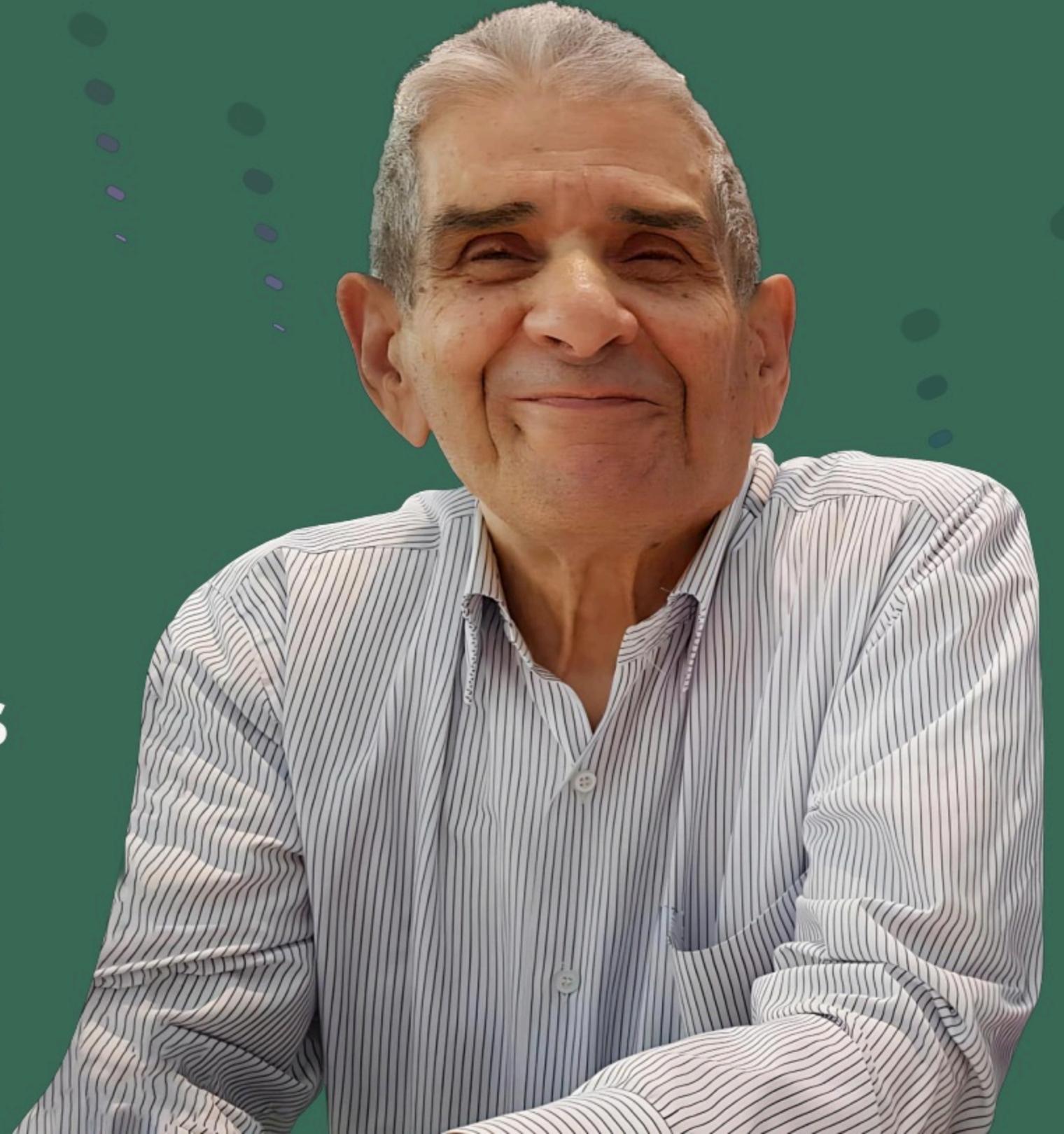




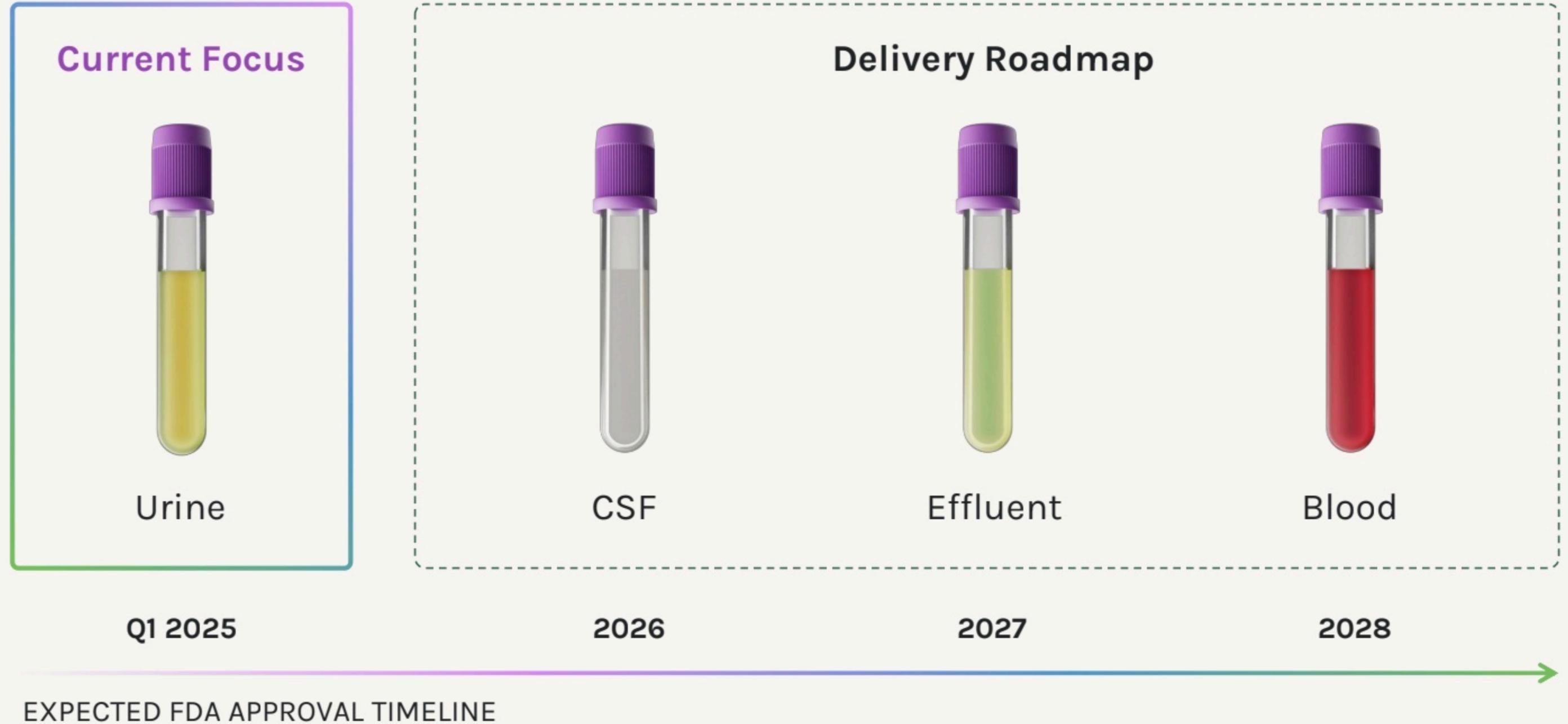
**Saving Lives Through
Antibiotic Sensitivity
Precision Diagnostics**

astekdx.com





Grand Vision





Universal Platform

While Astek Diagnostics has prioritized going to market first with a urine-based test, its vision is for the *Jiddu* system to confirm bacterial infections and assess antibiotic sensitivity across 4 sample types: urine, CSF, effluent, and blood.



Urine



CSF



Effluent



Blood



Comprehensive Approach



Urine

- ▶ UTI confirmation and antibiotic sensitivity in 1 hour.
- ▶ 408 urine-based tests already completed with increasingly high accuracy over time (c.97% accuracy level currently achieved: MedStar Health pilot).



CSF

- ▶ Meningitis confirmation and antibiotic sensitivity in 1 hour.
- ▶ Proof of concept data with 12 samples has already been accumulated as part of an active grant from the Henry Jackson Foundation.



Comprehensive Approach (Cont'd)



Effluent

- ▶ Surgical site infection confirmation and antibiotic sensitivity in 1 hour.
- ▶ Proof of concept data with 12 samples has already been accumulated in advance of ramping up work on this fluid as part of a pending DOD contract.

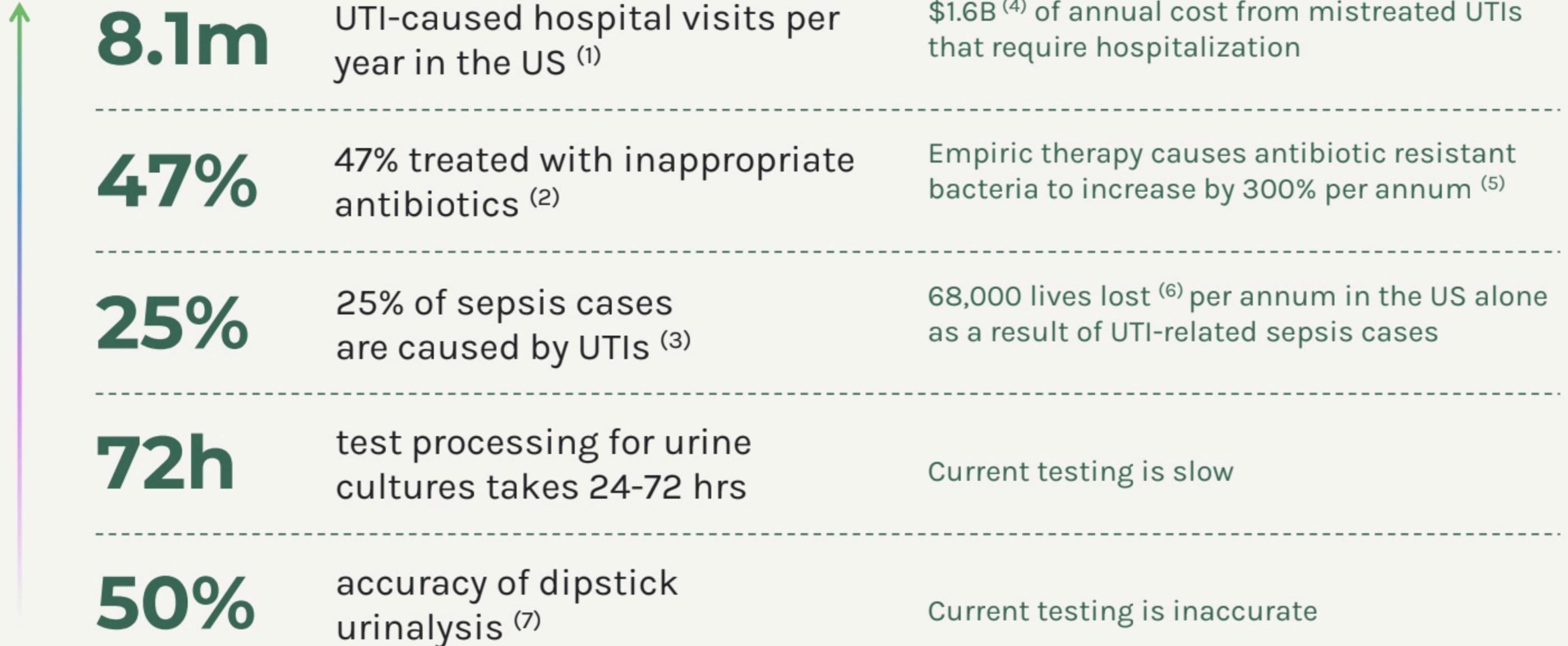


Blood

- ▶ Bacteremia confirmation and antibiotic sensitivity test in 1 hour.
- ▶ Proof of concept data from a study involving 59 ICU patients has already been accumulated with the company as part of an active NSF SBIR Phase 1 grant.



Current Focus: The UTI Problem



Source:

(1) [Link](#)

(2) [Link](#)

(3) [Link](#)

(4) *The Global Burden of Bacterial Antimicrobial Resistance in Urinary Tract Infections in 2019*, by A. J. C. van den Berg et al., published in *PLOS Medicine* in 2022.

(5) *Empiric Therapy and the Emergence of Antibiotic Resistance*, by J. A. Leggett et al., published in *Nature Microbiology* in 2019.

(6) [Link](#)

(7) [Link](#)



Current Focus: The UTI Problem



Mainly caused by overuse and misuse of antimicrobials



Leads to the emergence of new and more resistant strains of bacteria



The economic cost of AMR in the US alone is estimated at c.\$55 billion per year

Inadequate diagnostics

Improper antibiotic prescription

Development of resistant strains & serious complications like sepsis

Even harder infections

Inadequate diagnostics

Super Bug



The Solution: The *Jiddu* system



1-Hour Results

- ▶ Rapid UTI detection
- ▶ Antibiotic sensitivity indication ⁽¹⁾



Point-of-Care Testing

- ▶ Actionable results
- ▶ Expedited treatment



Ease of Use

- ▶ Basic training requirement
- ▶ Automated testing & Disposable cartridges



Cost effective

- ▶ \$10K as a one-time device purchase
- ▶ \$50 per test cartridge (recurring revenue stream)



(1) The device screens for 5 different antibiotics

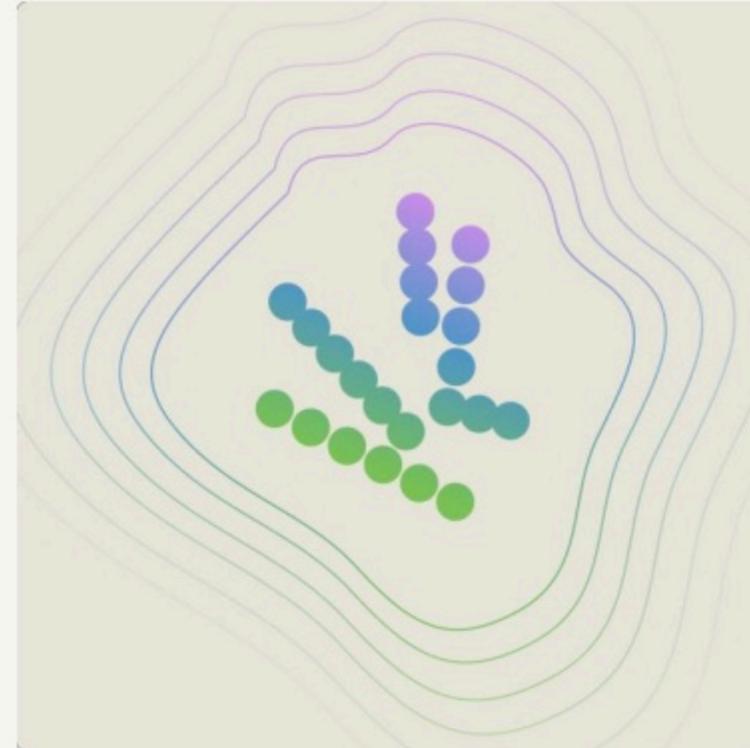


How it works



1 Place the sample into the cartridge

The sample is placed in a specialized microfluidic cartridge. The type of cartridge utilized varies with the sample type. Once attached, the cartridge is placed in the device and the automated testing process begins.

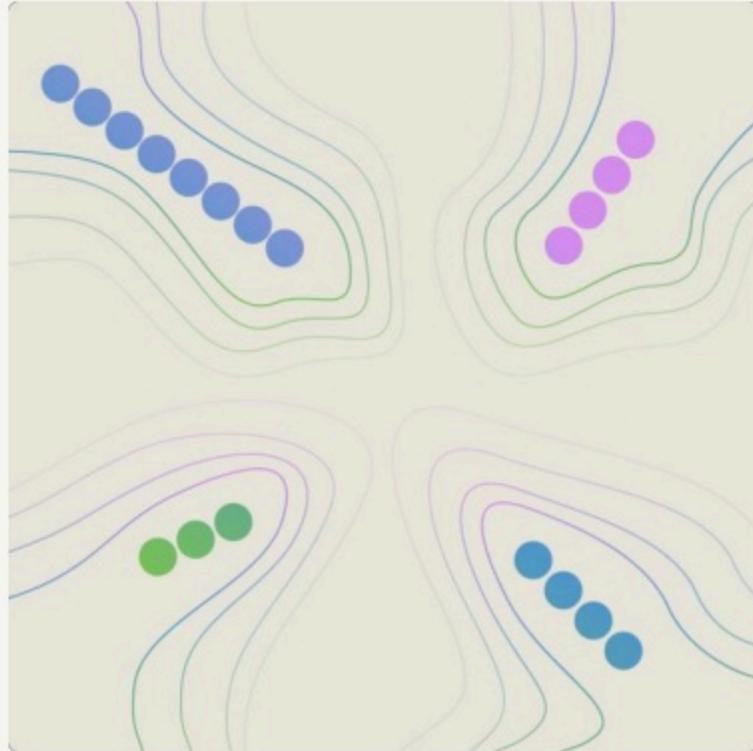


2 Bacteria from the sample is captured

Through an automated filtering process, the bacteria is captured from the sample. For the blood panel, this capturing process incorporates a step to eliminate hemoglobin from lysed blood cells.



How it works (Cont'd)



3 Cultivation and antibiotic testing

The sample is subdivided into multiple channels, allowing it to be mixed with specified antibiotics, as well as have two control channels. Once divided and mixed, the sample channels are cultivated for 35 minutes in a conducive media.

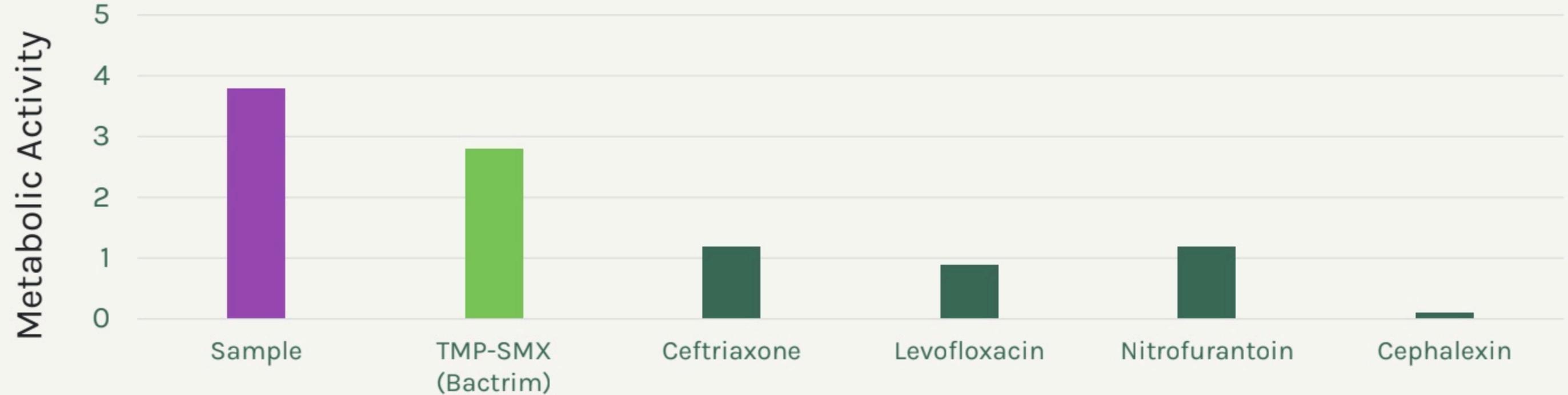


4 Detection of bacteria presence

The sample channels mix with specified reagents before moving to an analysis chamber. After 15 minutes, the device can confirm the presence of bacteria in the sample as well as provide antibiotic sensitivity results for the pre-selected antibiotics.



Technology: Metabolic Activity Detection



- A high metabolic activity shows that an infection is present
- TMP-SMX (marketed as Bactrim) is the go-to drug administered for UTIs
- A decline in metabolic activity indicates the antibiotic is working



Team



Mustafa Al-Adhami
Chief Executive Officer



Kevin Tran
Chief Technology
Officer



Rick Faint
Chief Financial
Officer



Scott O'Brian
Chief Commercial
Officer



Courtney Cavin
Engineer



Chris Skipwith PhD
Microbiologist



Isabella Penafiel
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Sam Wuyyuru
Computer Scientist



Ayisha Korme
Engineer



Advisory Board

Urine-based Testing

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Professor of Microbiology and Immunology, Loyola University

Neurogenic Diseases



Suzanne Groah, MD

Director of the SCI Rehabilitation and Recovery Program & Director of Spinal Cord Injury (SCI) Research at MedStar NRH

Family Medicine



Richard Colgan, MD

Professor and Executive Vice Chairman of the Department of Family and Community Medicine at University of Maryland School of Medicine

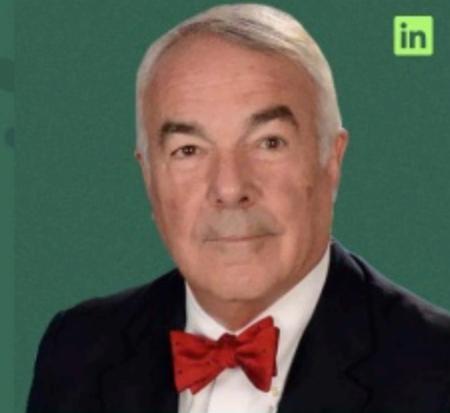
Urology



Daniel Oberlin, MD

Fellowship-trained Board-Certified Urologist at Golden Gate Urology, Inc.

Infectious Diseases



Alan Cross, MD

Professor of Medicine at the Center for Vaccine Development and Global Health

Blood-based Testing

Intensive Care



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Grantsmanship



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Regulatory Affairs



Shree Koushik, PhD

Managing Partner, BDRA Consulting, LLC

Urology



Pedram Ilbeigi, D.O. FACS

Board-certified urologist and CEO, Men's Health at HALO Dx

ICU



Mohan Tulapurkar, PhD

Research Associate at University of Maryland at Baltimore



Technology Validation

Technology Pilot Partners		
		
Status: Completed	Status: Ongoing	Status: Pending
Duration: Jun 2022 - May 2023	Duration: Jul 2023 - Jan 2024	Duration: Mar 2024 - May 2024
Accuracy: A: 82.00%; B: 95.60%	Accuracy: A: 96.97%; B: TBD	Accuracy: TBD

Early Pilot Results: <i>Jiddu</i> System				
	UMB Pilot (A) Jun - Dec 2022	UMB Pilot (B) Jan - May 2023	MedStar Pilot (A) Jul 2023 - Sep 2023	MedStar Pilot (B) Oct 2023 - Jan 2024
Samples	150	208	50	62
Accuracy	82.00%	95.60%	96.97%	Alpha Verification

- ▶ The *Jiddu* system has already completed 408 tests with increasingly high accuracy over time.



IP Overview

Area	Patent Disclosure
Test Algorithm (Issued)	Method and apparatus for rapid detection of bacterial contamination. Publication number: 20210223177.
Fluidic Cartridge (Pending)	Apparatus for separating the cellular and liquid portions of a whole blood sample. Publication number: 20210252507.
Reagent Mix (Pending)	Method and device for detecting presence, concentration, and antibiotic resistance of bacteria in urine samples. Application number: 63/525,510.
Rapid Cartridge Modification	System and method for automated translation of user requirements into engineering specifications and provide instructions for numerical control (NC) machines. Docket Number: 103662.20100.