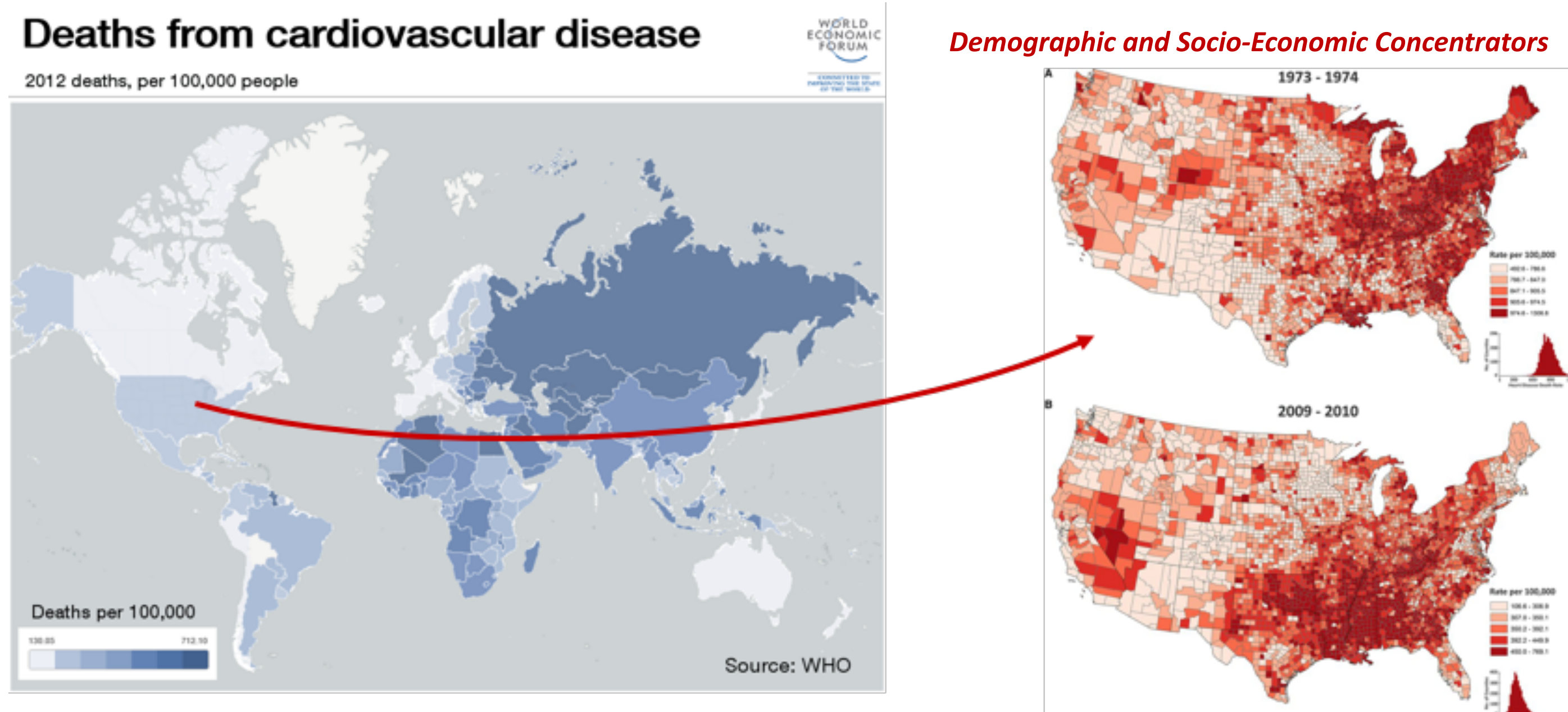


BN-3PO: MEDICAL APPLICATIONS AND TRANSLATION

mike wilkins-brendan turner-ben goodson-calvin shanahan-bret pienkosz-matt sabo-jack twiddy-alice difazio
north carolina state university-university of north carolina at chapel hill
UNITED STATES OF AMERICA

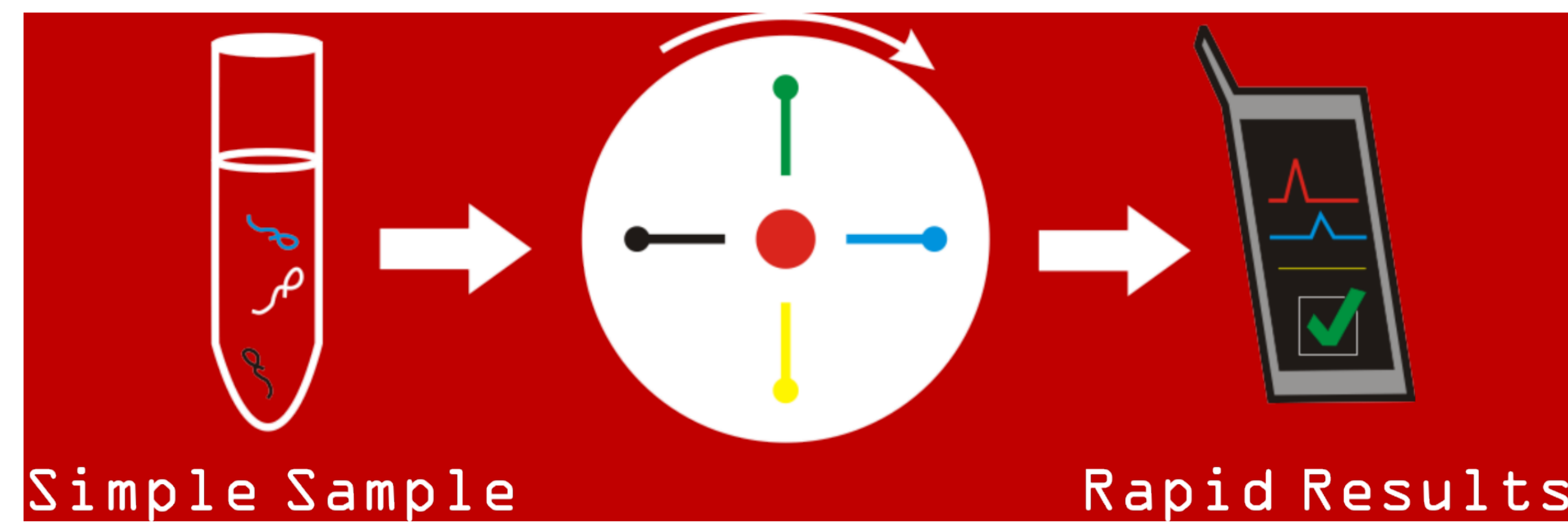
motivation and market

heart disease in america



About **6.5 million Americans** were diagnosed with heart failure in **2014**, with numbers expected to increase by up to 46% by 2030 [1].

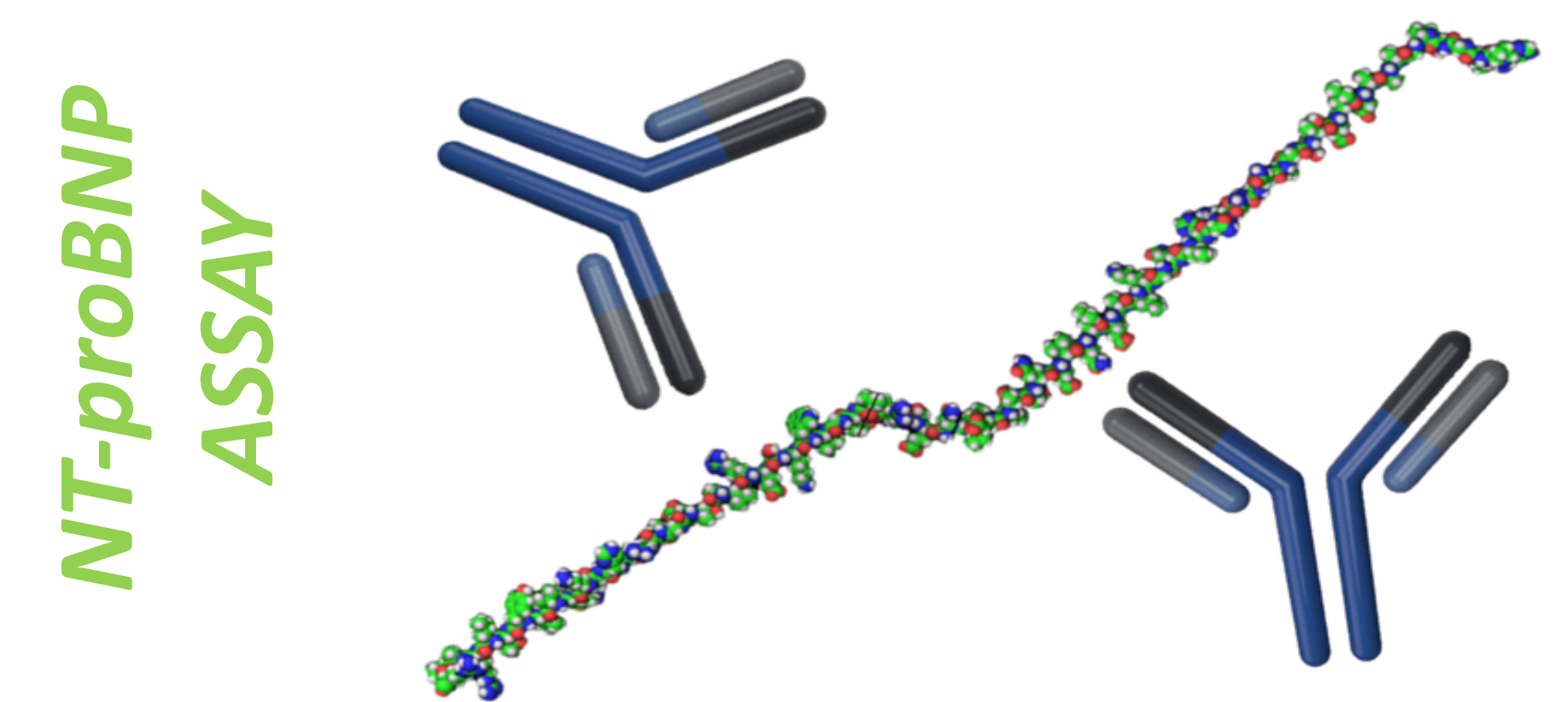
point of care solutions for next generation healthcare



NT-proBNP tests are generally not used in America, providing an **open market** for this product.

NT-proBNP = biomarker for heart failure

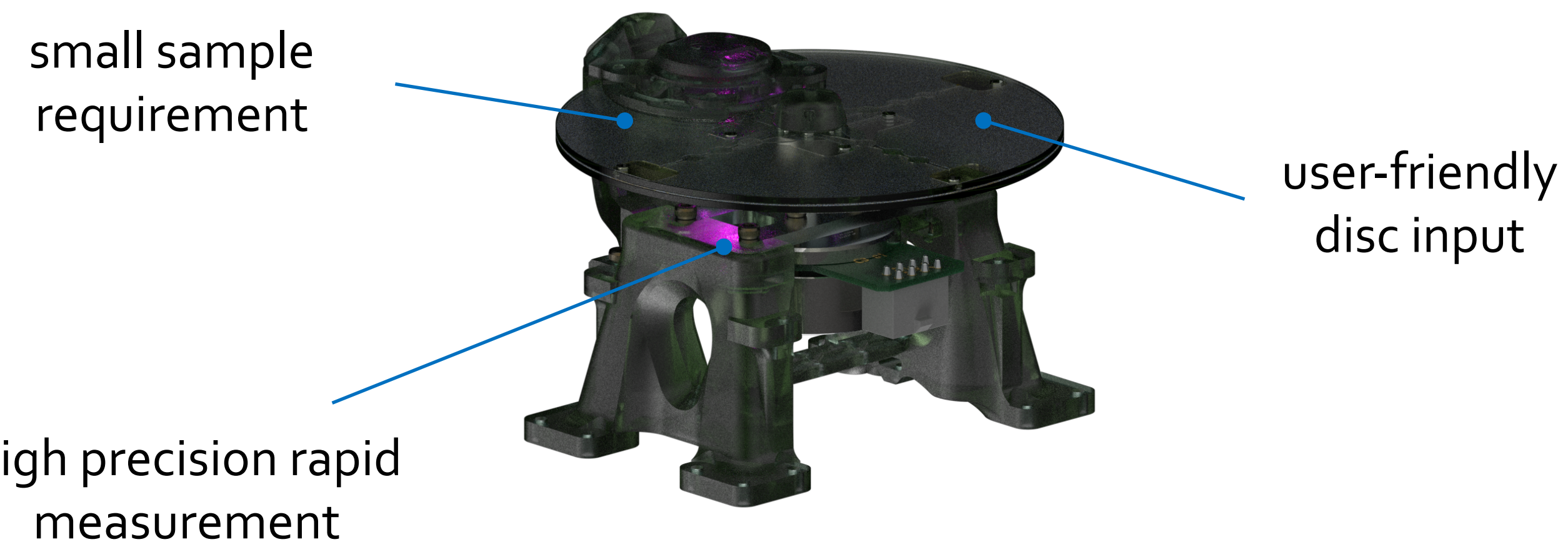
Other tests may only rule out but not confirm the presence of heart failure [2].
NT-proBNP has been identified as a cardiac biomarker that can be used as a criterion for hospitalization due to heart failure [3].



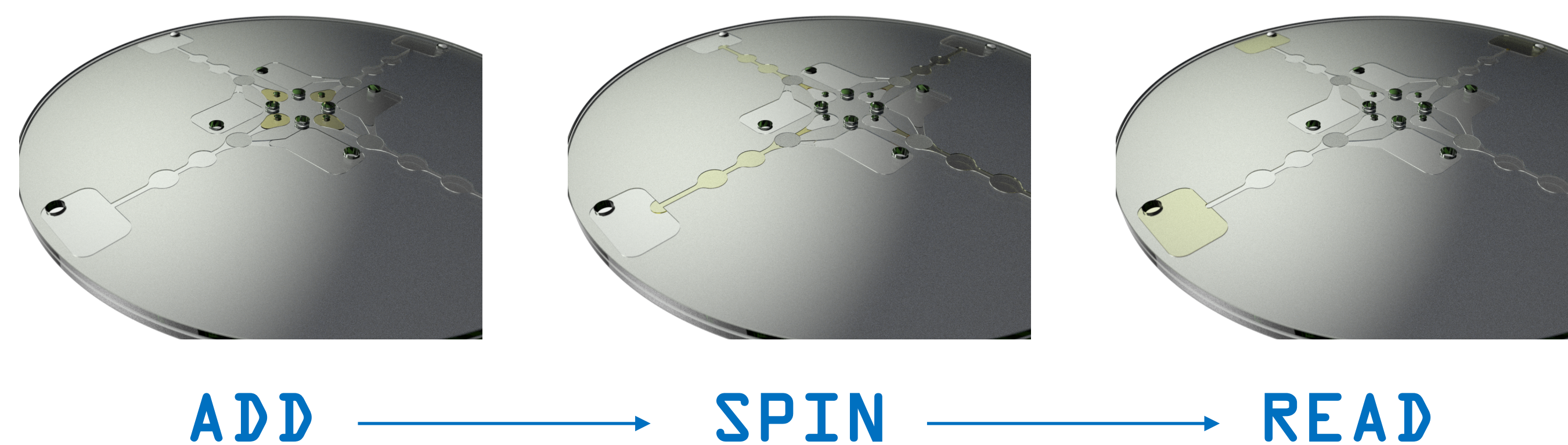
design specifications

quick and accurate diagnosis

- Around 5 minutes until initial results.
- Only 5 uL of sample required for testing.
- Disposable discs for quick testing/affordable cost.
- Device takes the average of several readings to get a more accurate readout.



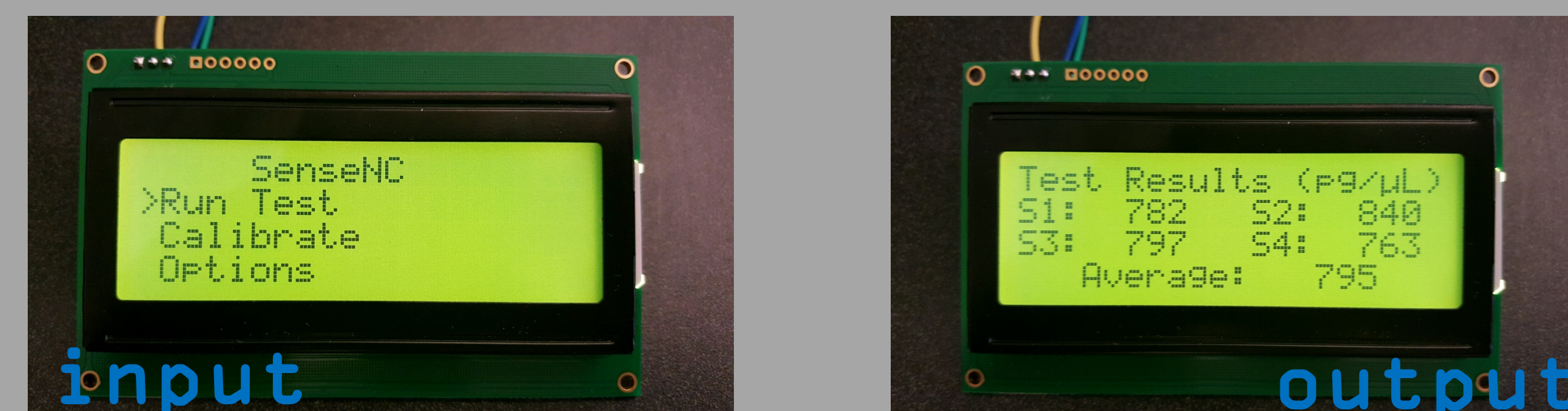
CD-inspired disposable assay platform



commercialization

To be used in **diagnostic labs** and **point-of-care settings**, the **SenseNC BN-3PO** can streamline the diagnosis of heart failure.

user interface

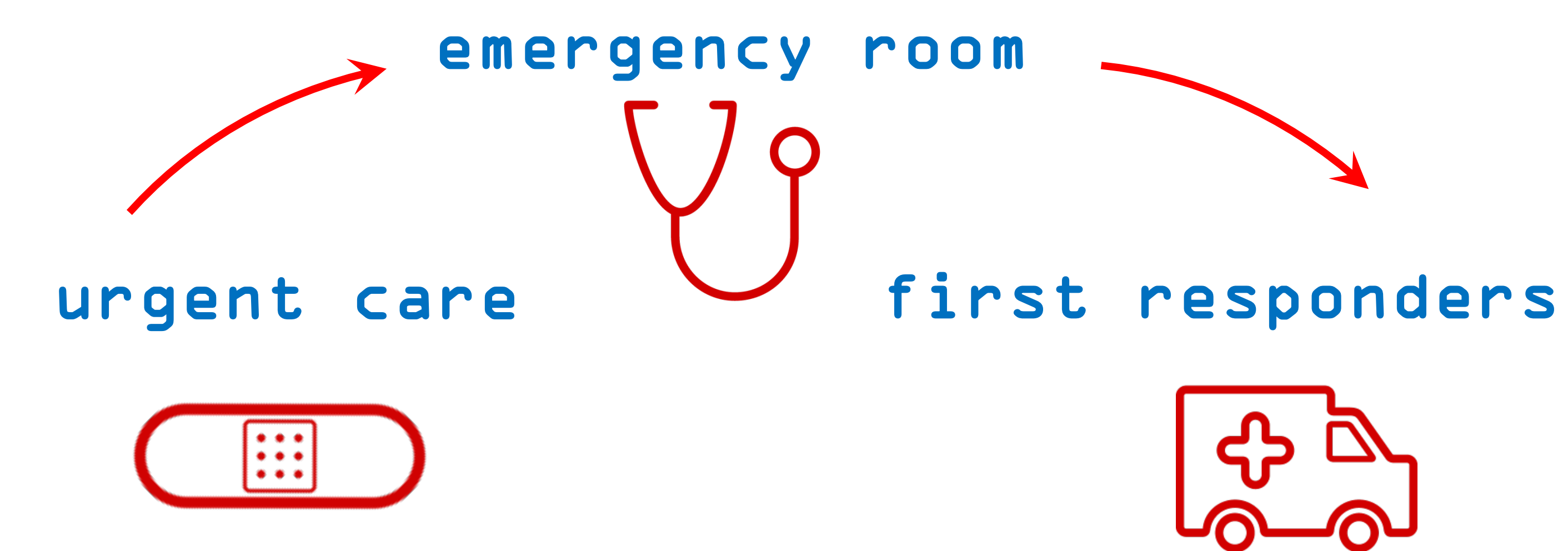


- Since a very small amount of blood is required, the device could potentially evolve into a point-of-care use device, or even a home use device.
- An elution buffer may also be introduced to allow reuse of discs.

references

- [1] <http://newsroom.heart.org/news/latest-statistics-show-heart-failure-on-the-rise;-cardiovascular-diseases-remain-leading-killer>
- [2] <http://www.healthline.com/health/myoglobin-serum#results6>
- [3] <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3434897/>

implementation



In a **rural urgent care** setting, the SenseNC BN-3Po rapid detection device would allow for **accurate point-of-care heart attack diagnosis** where equivalent technology is unavailable.

Upon success in urgent care, emergency rooms would benefit from our **benchtop BNP rapid detection** device to determine short-term treatment plans for heart attack patients.

Future device generations can be **mobile and handheld**, allowing use in a first response setting for **diagnosis in-route to care center**.

