



Rapid Results

Confident Decisions

Effective Interventions

Reduced Costs

## THE NEXT STEP IN OUTBREAK INVESTIGATIONS

### HAIs are among the leading threats to patient safety

Healthcare associated infections (HAIs) are a widespread challenge for patient care, annually affecting 4-5% of hospitalized patients in the U.S.<sup>1</sup> and resulting in 99,000 patient deaths per year<sup>2</sup>. The rising prevalence of multi-drug resistant organisms (MDROs) has made HAIs particularly dangerous, increasing the pressure for rapid, effective interventions when an outbreak is suspected<sup>3,4</sup>.

### The economic impact to hospitals is significant

Hospitals invest far more to control HAIs than they realize. Patient isolation protocols and ward closings take hospital bed capacity offline. Staff and patient screening, decolonization, and monitoring measures, performed out of an abundance of caution rather than certainty of transmission, can cost thousands of dollars<sup>5,6</sup>. All of these interventions are necessary because failure to control an outbreak can result not just in patient harm, but in financial penalties for poor performance from payors and questions about patient safety from regulators and the media. Hospitals increasingly have both economic and patient care incentives to identify outbreaks as soon as possible.

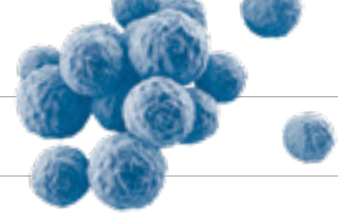
### Infection control needs faster, more precise diagnostics

The imprecise and subjective process used to identify a suspected transmission today leaves much to be desired<sup>7</sup>. Routine surveillance often identifies suspected cases that drive the implementation of expensive and burdensome cautionary control measures without the benefit of definitive confirmation<sup>8,9</sup>. In cases where an outbreak requires an urgent, wide-ranging intervention, a lack of precision and certainty can also compromise the speed of the organization's response.

### epiXact is your solution for effective decision making

Day Zero Diagnostics introduces the precision of whole genome sequencing (WGS) to HAI investigations with epiXact, our rapid service for determining pathogen relatedness. Within 2-3 days of ordering the service, you will receive an easy-to-read report with definitive and actionable results so you can quickly rule in or rule out an HAI transmission. epiXact helps you devote time and energy to the situations that matter most, and helps avoid unnecessary cost and disruption when an HAI event can be safely ruled out.



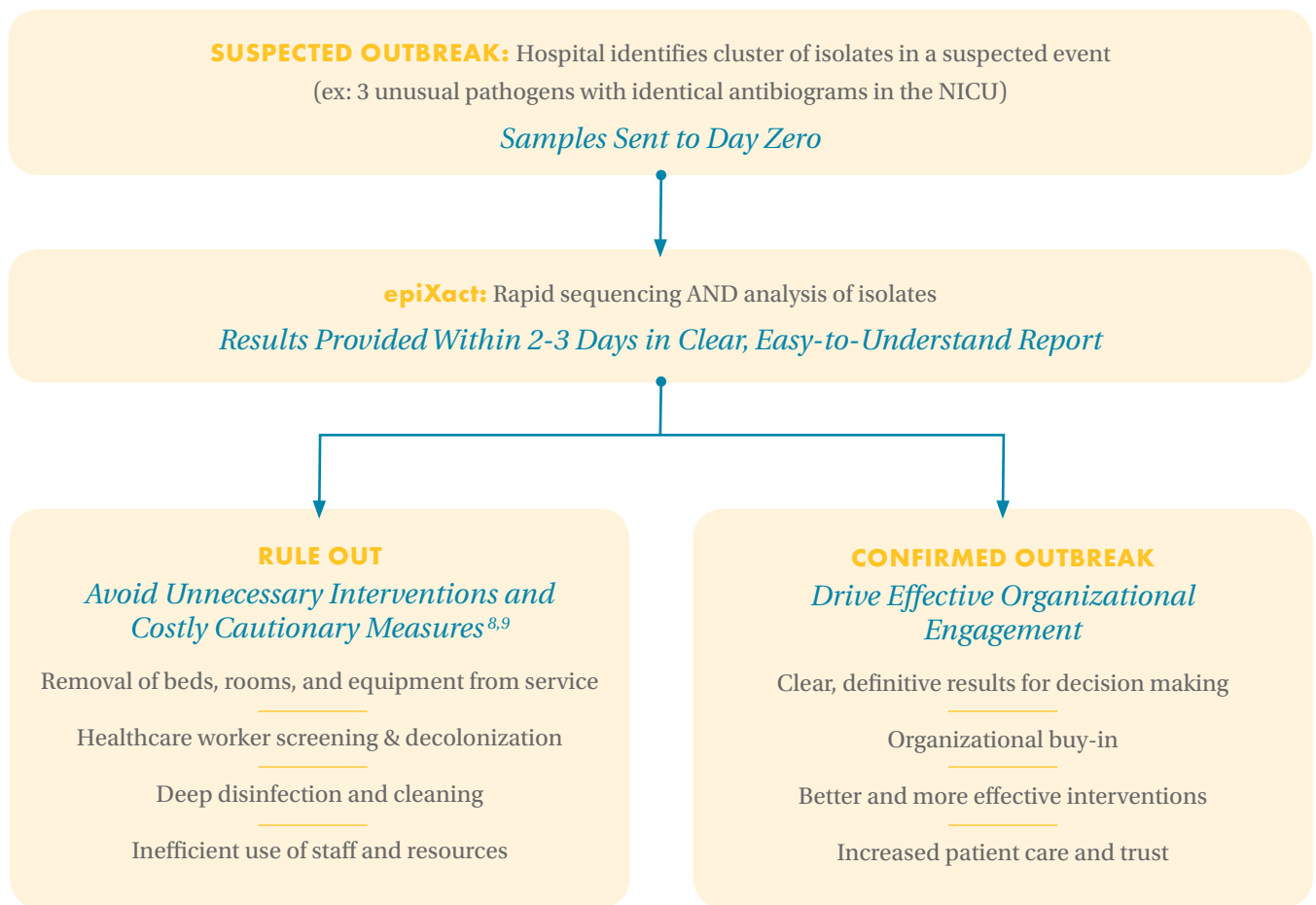


## Precise, reliable results with epiXact

epiXact is a rapid, sequencing based service which provides a definitive determination of the relatedness of pathogens in a suspected outbreak. WGS methods provide higher resolution and accuracy than traditional methods such as PFGE and MLST typing. epiXact helps you make high stakes intervention decisions quickly and confidently.

- Sequencing and analysis completed by a team of scientists with expertise in microbial genomics
- Easy-to-understand report designed for infection control professionals, not bioinformatic researchers
- Use of single nucleotide polymorphism (SNP) comparison of the whole genomes of all samples
- Results provided in 2-3 days to support timely decision-making

## Day Zero Diagnostics: rapid response partners in high stakes situations



REFERENCES: 1. Magill, S.S., et al., Multistate point-prevalence survey of health care-associated infections. *New England Journal of Medicine*, 2014. 370(13): p. 1198-1208. 2. Klevens, R.M., et al., Estimating Health Care-Associated Infections and Deaths in U.S. Hospitals, 2002. *Public Health Reports*, 2007. 122(2): p. 160-166. 3. Weiner, L.M., et al., Vital Signs: Preventing Antibiotic-Resistant Infections in Hospitals — United States, 2014. *MMWR Morb Mortal Wkly Rep*, 2016. 65(9): p. 235-41. 4. Neidell, M.J., et al., Costs of healthcare-associated infections with antimicrobial-resistant versus antimicrobial-susceptible organisms. *Clin Infect Dis*, 2012. 55(6): p. 807-15. 5. Greco, G., et al., Costs associated with health care-associated infections in cardiac surgery. *J Am Coll Cardiol*, 2015. 65(1): p. 15-23. 6. Zimlichman, E., et al., Health care-associated infections: a meta-analysis of costs and financial impact on the US health care system. *JAMA Intern Med*, 2013. 173(22): p. 2039-46. 7. Peacock, S.J., J. Parkhill, and N.M. Brown, Changing the paradigm for hospital outbreak detection by leading with genomic surveillance of nosocomial pathogens. 2018. 164(10): p. 1213-1219. 8. Huang, S.S., et al., Targeted versus Universal Decolonization to Prevent ICU Infection. *New England Journal of Medicine*, 2013. 368(24): p. 2255-2265. 9. Deurenberg, R.H., et al., Application of next generation sequencing in clinical microbiology and infection prevention. *Journal of Biotechnology*, 2017. 243: p. 16-24.

# epiXact<sup>SM</sup>

Putative outbreak investigations involve high stakes decisions. We understand that. Our epiXact healthcare associated infection investigation service provides rapid and definitive determination of pathogen relatedness using best-in-class whole genome sequencing and analysis. Our turnaround time of 2-3 days empowers you to make intervention decisions quickly and with confidence.

## MOBILIZING EPIXACT FOR OUTBREAK INVESTIGATIONS



### Contact Us

For more information or to initiate epiXact HAI service, email us at [orders@dayzerodiagnosics.com](mailto:orders@dayzerodiagnosics.com) or submit a request form at [www.dayzerodiagnosics.com/HAI](http://www.dayzerodiagnosics.com/HAI). Our team will contact you promptly.



### Sample Transfer

Our microbiologists will provide you with straightforward sample handling instructions and work with your microbiology lab to obtain your samples quickly and efficiently.



### Sequencing and Analysis

Our scientists will prepare your samples and perform deep-coverage whole genome sequencing. Our world class computational biologists will then analyze your genomic data using our custom bioinformatics pipelines.



### Report Delivery

Within 2-3 days of receiving your samples, sometimes even faster, a clear and concise report will be generated and delivered electronically. Our expert analysts will be available for your questions.



#### REPORT DETAILS:

- Determination of outbreak cluster inclusion / exclusion for each sample
- Confirmation of organism ID and MLST typing
- SNP based sequence analysis and distance matrix visualization of relatedness
- Sequencing quality metrics including genome coverage and Q-score

Visit [www.dayzerodiagnosics.com/HAI](http://www.dayzerodiagnosics.com/HAI)  
for more information or contact us at  
[orders@dayzerodiagnosics.com](mailto:orders@dayzerodiagnosics.com)



## FREQUENTLY ASKED QUESTIONS

### *What samples does DZD accept?*

Currently we accept pure culture isolates on agar petri dishes or slants. Detailed instructions for sample collection and shipping will be provided upon service request.

### *Where are the samples processed?*

All processing is conducted at our private BSL 2+ facility located within the Harvard Life Lab in Boston, MA.

### *Who is responsible for managing the process?*

Our lab is staffed by scientists with extensive experience in molecular microbiology, DNA sequencing and computational biology. A senior representative from the company will serve as your consultant for the process to ensure timelines and expectations are met.

### *What does the service cost?*

We charge rates similar to those charged for other molecular diagnostic testing. We can provide you with a specific rate for your situation and anticipated samples. Your first investigation with us is at a reduced rate that makes it easy to get started, so you can experience what working with us is like.

### *How long does it take to get started arranging an investigation?*

We recognize that speed is critical in an outbreak investigation. Our team treats your project with the highest urgency to ensure rapid turnaround, including a fast and easy process to get going.

### *How is the report delivered?*

We deliver the report to you electronically in PDF format. We can also deliver by fax or mail upon request.

### *How fast should we expect the report to be delivered?*

We deliver reports in 2-3 days from the time we receive the samples. In some cases, we are able to provide a preliminary answer within 24 hours.

### *Can your service handle environmental samples or just patient cultures?*

We have performed HAI investigations on cultures grown from patient clinical samples and environmental samples. Our process is designed to handle culture isolates regardless of source.

### *Does your report include an antibiotic resistance profile?*

We do not currently provide an antibiotic resistance profile with each analysis, but do request your microbiology lab phenotypic results to aid in our analysis.

### *Can you identify horizontal (plasmid) transmission in addition to clonal?*

Yes, however this analysis is done only by request, and may require additional processing time.

### *How are you able to provide the analysis so quickly?*

We have designed a rapid turnaround sequencing pipeline optimized for HAI investigation. Analysis is performed by world class computational biologists with deep experience in microbial genomics, supported by our custom, automated pipeline.

### *Can we speak with someone about the report?*

Our fast response team is here to support you in making confident intervention decisions. Our scientists are available for consultation and to help you understand the report.