

Laboratorians' Opportunities to Improve Diagnosis

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An accurate and timely diagnosis is one of the most difficult and complex processes in medicine. Starting when the patient presents with a problem, it requires the integration of data from the patient narrative (symptoms and their evolution, pertinent family history, existing comorbidities, prescription and over the counter medicines, as well as relevant social determinants of health) and the physical exam in order to develop a tentative differential that includes likely and “can’t miss” conditions. The development of the differential diagnosis then typically drives one or more cycles of test orders from among 3000 to 4000 available clinical laboratory tests, as well as genetic, anatomic pathology, and imaging tests. Finally, test results are interpreted in the context of the previously collected information to determine a working diagnosis that is used to drive subsequent care decisions.

While uncertainty is nearly always present, most diagnoses result in appropriate treatments, however, inaccurate or delayed diagnosis remains the most common, most catastrophic, and most costly of all patient safety problems. Diagnostic error kills or permanently disables approximately 800 000 Americans each year across all clinical settings (1). The total cost to the US

economy is estimated to be more than 100 billion dollars (2). Improving diagnostic quality can then dramatically improve patient outcomes and lower the cost of healthcare, but such efforts have been limited. Our understanding of diagnostic error was recently aided by researchers who used malpractice claims to study the epidemiology of diagnostic harm. They found serious harm was highly concentrated in a few common conditions associated with infections, cancer, and vascular events. They also identified contributing factors that lead to diagnostic error. For example, cognitive failures were a contributing factor in 85% of all claims alleging serious diagnostic harm. Three of the 5 most common cognitive factors were failures in test ordering; failures in recognizing the significance of test results; and failures in the interpretation of results (3). Clearly, strategies to reduce cognitive-based errors related to testing could have great impact. Alternatively, diagnostic improvement can occur through implementing interventions built on new applications of technology, new workflows, or new programs.

Health systems often employ quality improvement teams to reduce error rates or introduce novel programs. Such teams are often limited to

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Received July 05, 2023; accepted September 13, 2023.

<https://doi.org/10.1093/jalm/jfad076>

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<p>UNIVANTS OF HEALTHCARE EXCELLENCE GLOBAL WINNERS</p> <p>Program ROSE (Removing Obstacles to cervical Screening) - Empowering Women to Eliminate Cervical Cancer – ROSE Foundation</p>		<p>Yin Ling Woo Marion Saville Yit Lee Choo</p> <p>Adeeba Kamarulzaman Mun Li Yam</p>
<p>The “Bubble”: Safe and Informed Population Health Management Based on Strategic, Novel Laboratory Testing to Restart a Global Sports League, Stimulate the Economy and Foster Normalcy During the COVID-19 Pandemic – National Basketball Association</p>		<p>Christina Mack Jim Weisberger David Weiss</p> <p>Yonatan Grad David Ho</p>
<p>Improving the Peri-Operative Pathway of People with Diabetes Undergoing Elective Surgery: the IP3D Project – Ipswich Hospital, East Suffolk and North Essex NHS Foundation Trust</p>		<p>Gerry Rayman Alican Caimota Emma Page</p> <p>Rachel Allen Ruth Deroy</p>
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<p>Early Diagnosis of Maternal Cytomegalovirus for Improved Management and Reduced Risk of Fetal Transmission and Complications – National Reference Center for Herpesvirus, University Hospital Center</p>		<p>Sebastien Hantz Perrine Coste-Mazeau Sophie Alain</p> <p>Elodie Ribot Melissa Mayeras</p>
<p>Enhanced Resource Utilization, Reduced Waste, and Expedited Transplantation Through Real-Time Donor Screening for Infectious Disease – Mid-America Transplant, St. Louis, Missouri</p>		<p>Amber Carriker Linda Martin Erica Hintertser</p> <p>Lindsey Speir Kevin Lee</p>
<p>Getting to Zero Harm in Controlled Substance Prescribing: Increasing the Accuracy of Prescription Compliance Monitoring Through Enhanced Drug Testing Support – University Hospitals, Cleveland</p>		<p>Jaime Neguez Christine Schmotzer Sean Hoynes</p> <p>Héidi DeVecchio Jeanne Lacklapp</p>
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<p>Enhancing Resource Utilization and Improving Patient Experience Through Strategic Laboratory Stewardship – Ain-Shams University - Emergency Hospital</p>		<p>Wessam EL-Sayed Saad Essam Fakhry Ebied Rawan Mahmoud Mohamed</p> <p>Ashraf Hassan Abdelmohdy Nouran Mahmoud Bahig</p>
<p>Enhanced Staff Satisfaction and Resource Utilization During the COVID-19 Pandemic – Associação Fundo de Incentivo a Pesquisa - AFIP</p>		<p>Debora Ribeiro Ramadan Tatiane Rodrigues dos Santos Josué Augusto do Amaral Rocha</p> <p>Cristiane Franca Ferreira Paulo Eduardo de Andrade Souza</p>
<p>Improving Emergency Department Flow and Decreasing Risk Through Development and Implementation of Molecular Diagnostics Guided Triage – Clinical Hospital Center Rijeka</p>		<p>Martina Pavletic Vanda Juranic Lisinic Mate Lerga</p> <p>Mario Franic Jennifer Babic</p>
<p>Improved and Accelerated Diagnostic Pathway for Patients That Present to the Emergency Department with Suspected Mild Traumatic Brain Injury – Hospital Universitario Virgen de las Nieves</p>		<p>Gemma Álvarez Corral Maria Molina Zayas Francisco Ruiz-Cabello Osuna</p> <p>Maria Isabel Romero Manjon Eva Gutierrez Perez</p>
<p>A Noninvasive Serologic Model Using an Intelligent Informatic Solution to Enhance Clinical Decision-Making and Improve Patient Safety – The Second Norman Bethune Hospital of Jilin University</p>		<p>Yinlong Zhao Zhengjing Jin Yongsheng Yang</p> <p>Chunmei Hu Yan Zhao</p>

Fig. 1. 2022 UNIVANTS of Healthcare Excellence award winners.

patient-facing staff and are therefore deprived of laboratorians' expertise, which is unfortunate given the prominent role of the testing process in diagnosis. Laboratorians' knowledge of test limitations and confounding factors that affect the interpretation of results can significantly mitigate the risk of diagnostic error, and their knowledge of new biomarkers or new technology applications can become the basis for a novel program.

Whether seeking reductions in error rates or implementing innovative processes designed to improve outcomes, defining a project that is promising and will garner leadership support can be challenging, especially in this era of constrained resources and resistance to change. Drawing on the successful experiences of teams from other organizations can help minimize risk by serving as a roadmap for program design and implementation or as a springboard for new ideas built on a proven foundation.

The UNIVANTS of Healthcare Excellence program, developed and supported by Abbott in partnership with 7 leading healthcare organizations, showcases examples of teams that have improved patient outcomes through novel interventions and have produced real-world evidence to validate that improvement. Since its inception 5 years ago, the UNIVANTS program has produced more than 60 examples that utilize

laboratory professionals to improve patient outcomes. Descriptions of the projects are available at the UNIVANTS website (www.univantshce.com).

A review of the 2022 winners (Fig. 1) found more emphasis on developing new processes and programs (8 of 11) rather than addressing rates of error (3 of 11). Certainly, new applications of science that improve outcomes are important, but increased attention to the sources of error is needed to eliminate the harm experienced globally.

In sum, diagnostic errors impose a significant burden on patients and healthcare systems. A substantial portion of these errors involve the testing process. Growth in knowledge and the availability of new technologies offer clear diagnostic improvement opportunities. The UNIVANTS' database of implemented interventions consists of case studies with documented evidence of improved outcomes. They further demonstrate that laboratorians, as part of a multidisciplinary team, can play an important and unique role in reducing the burden of diagnostic error and improving diagnostic outcomes. As stated by the National Academy of Medicine, "Improving the diagnostic process is not only possible, but it also represents a moral, professional, and public health imperative" (4).

Author Contributions: *The corresponding author takes full responsibility that all authors on this publication have met the following required criteria of eligibility for authorship: (a) significant contributions to the conception and design, acquisition of data, or analysis and interpretation of data; (b) drafting or revising the article for intellectual content; (c) final approval of the published article; and (d) agreement to be accountable for all aspects of the article thus ensuring that questions related to the accuracy or integrity of any part of the article are appropriately investigated and resolved. Nobody who qualifies for authorship has been omitted from the list.*

Authors' Disclosures or Potential Conflicts of Interest: *Upon manuscript submission, all authors completed the author disclosure form.*

Research Funding: P.L. Epner, research contract with Mass General Brigham.

Disclosures: P.L. Epner, Sepsis Alliance, Board Vice Chair; Society to Improve Diagnosis in Medicine, CEO (retired); National Steering Committee for Patient Safety (IHI/AHRQ), member. Consulting fees, honoraria, and travel support for attending meetings from Abbott.

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