From alleviating worries about potential preeclampsia (PE) and improving treatment for patients with acute kidney injury (AKI) to automating testing of liver function, this year’s UNIVANTS winners are transforming not only diagnostics but also complete networks of care through innovations in clinical laboratory medicine.

AACC has partnered with Abbott and other leading healthcare organizations in the launch of the UNIVANTS of Healthcare Excellence award. The award recognizes interdisciplinary teams around the world that have achieved measurable, innovative impacts within healthcare systems.

The teams being recognized in this first year of the award had to pass a high bar. To be eligible for the award, applicants had to be part of an integrated clinical care team focused on advancing healthcare and comprised of members from at least three different disciplines, including the laboratory. In addition, the project had to demonstrate measurable impact to patients, payors, clinicians, and health systems, and to capture metrics related to organizational key performance indicators (KPI), with at least one KPI measured quantitatively. Below, we profile three winners.

**Game Changer: Ruling Out Potential Preeclampsia**

While PE, a hypertensive disorder of pregnancy, affects 4%-8% of women globally and causes major maternal and fetal morbidity and mortality, current methods for measuring blood pressure and proteinuria are suboptimal, identifying only about 20% of those at risk for adverse outcomes.

Based on previously published research, a laboratorian and an obstetrician with the United Kingdom’s National Health Service (NHS) began using two angiogenic biomarkers to improve diagnosis and management of women presenting with a suspicion of PE. The team included Manu Vatish, MBBCh, an academic obstetrician with Oxford University, and Tim James, PhD, head biomedical scientist in the Clinical Biochemistry Department at the John Radcliffe Hospital in Oxford, England.

The initial stage of their research involved developing a protocol to assess mother and baby outcomes if patients suspected of PE were tested for the biomarkers soluble fms-like tyrosine kinase (sFlt-1) and placental growth factor (PlGF). While the obstetrical research community knew that the ratio of these biomarkers was elevated in pregnant women before the onset of PE, the ratio’s predictive value and impact on care was unclear.

Vatish’s and James’s work found clear diagnostic improvement and better outcomes when the tests were available: the risk of PE in the 7 days following testing of these two biomarkers was less than 1% in women with a sFlt1:PlGF ratio <38. For those with...
Acute Kidney Injury

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Other hospitals in regions around

Oxford already are rolling out the testing

protocol, and clinicians from a number

countries have contacted Vatish and

about adopting the protocol.

“There’s a lot of interest in South Africa,

where there is a high burden of PE,” said

James. “We’ve also had conversations with

people in Canada, the Middle East, Israel,

Japan, and China.” The test protocol is

currently under consideration by the

Food and Drug Administration.

Adoption of this protocol will have a

significant, positive effect on pregnant

women across the globe, according to

Vatish and James. “The assessment of a

pregnant woman for preeclampsia hasn’t

changed for 80 years, so this test is a big

evolutionary step,” Vatish commented.

“It’s a game changer.”

Reducing Mortality from

Acute Kidney Injury

AKI is a major determinant of chronic

kidney disease and cardiovascular

mortality, but many patients with AKI

are not properly identified. A multidisci-

plinary team involving internal medicine,

laboratory medicine, and nephrology in

Potsdam, Germany, found that fewer than

25% of patients who developed AKI dur-

ing their hospital stay had the condition

documented in their medical record.

In addition, the same low percentage of

patients benefited from their general

practitioners being informed so appropri-

ate follow up care could be provided.

The team joined forces in 2017 to see

if they could develop a better method

of identifying patients with AKI so

that appropriate treatment could be

started earlier. Saban Elitok, MD, the

medical director of the Department of

Nephrology and Endocrinology at Ernst-

von-Bergmann Hospital in Potsdam,

worked with Michael Haase, MD, a physi-

cian with the Dialysis Center Potsdam

and the Diureum Kidney Care Center

MVZ Potsdam, affiliated with Otto-

von-Guericke University Magdeburg, to
develop a hospital-wide electronic AKI

alert. They based the alert on increase

of serum creatinine according to Kidney

Disease Improving Global Outcomes AKI

guidelines. The alert appears in a patient’s

medical record when there is a significant

rise in creatinine based on one of two

measures: Either delta creatinine exceeds

26 µmol/L within 48 hours (absolute

criteria) or there is a 50% increase in delta

creatinine compared to baseline within 7
days (relative criteria).

The first year of the initiative saw

more than 1,000 AKI alerts and consults.

Leveraging serum creatinine increase as a

screening tool for all patients admitted to

the hospital enabled the team to discover

that 4.5% of all hospitalized patients had

previously undiagnosed AKI.

Since the Potsdam AKI Care Initiative

was launched, the rate of unknown causes

of AKI has dropped by 80%, while AKI

documentation has increased by twofold

and AKI coding increased by threefold.

Further, AKI complications have been

reduced by more than 50%.

“Creatinine values were checked

before, but if you are a neurologist or an

orthopedic surgeon, you might not know

when a certain value indicates a problem,”

explained Elitok. “This test compares two

values and then alerts the doctor if there

is a significant increase. That’s when the

doctor gets prompted to consult with a

nephrologist.”

The benefits of the Potsdam AKI

Care Initiative are numerous. Not only

are patients receiving appropriate kidney

care, but also reductions in length of stay

save overall healthcare costs. “Awareness

of AKI has been relatively low in the

past,” said Haase. “Without this initiative,

[patients are not recognized and] get lost

in the system.”

“The laboratory is an integral part

of the project, along with the information

technology department,” added Elitok.

Intelligent Liver Function Testing

Although liver disease is the fifth largest

cause of death in the United Kingdom,

patients continue to present with undiag-
nosed end-stage liver disease (ESLD) that

likely could have been prevented with

earlier diagnosis. Researchers with the

University of Dundee and NHS Tayside

in Dundee, Scotland, found a practical

way to tackle this challenge. By standard-

izing the application and investigation of

liver function testing (LFT) results using

an intelligent evidence-based predictive

algorithm, they substantially increased

the early detection of liver disease while

producing long-term cost savings for the

health system.

At the study’s onset, one third of the

patients who presented in Dundee with

previously undiagnosed ESLD died dur-

ing their first visit. A retrospective

analysis indicated that many of the deceased

patients had abnormal LFTs in their

patient history with little to no follow-up.

“Abnormalities are very common, and

sometimes they are numerically relatively

small, so they often get overlooked,”

explained John Dillon, MD, professor of

hepatology and gastroenterology at the

University of Dundee School of Medicine.

“We assembled a group of hepatolo-

gists, gave them a set of information on

patients, such as test results, patient body

mass index (BMI), and alcohol use, and

we asked them to make a diagnosis. They

came up with 32 possible outcomes with

different combinations of results. We

had a high degree of clinical confidence

in these rules and we ran them on about

300 patients to prove the results were

accurate.”

Ellie Dow, MD, a consultant in

biochemical medicine, blood sciences, at

NHS Tayside, then automated the testing

so that abnormal results would automati-

cally trigger additional reflex testing and

produce reports that clinicians could use

for treatment. “The challenge for me was

to make the test very easy for family doc-
tors to request and then give them results

in a format they could easily understand.

This helped them determine which

past.”

just important, this research found

that the negative predictive value of the

test was much higher and could safely

help women who were at very low risk of

PE avoid hospital admission. A low ratio

has a 99.6% negative predictive value for
developing PE within 7 days.

On the basis of the positive impact

observed in the initial study and the clear

improvements to diagnostic accuracy, the

Oxford team introduced the protocol into

routine clinical care in 2018. Initial

analysis of hospital admissions shows a

20% decrease in PE-related admissions.

The reduction has been mostly driven

by the test’s use at the hospital’s mater-
nity assessment unit, the equivalent of

an emergency department for pregnant

women. The expectation, said James and

Vatish, is that the reduction in admis-
sions will continue to increase as the test

comes more firmly embedded in clini-
cal thinking.

Other hospitals in regions around

Oxford already are rolling out the testing

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countries have contacted Vatish and

James about adopting the protocol.

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SABAN ELITOK, MD
patients they could manage themselves in primary care and which patients should be sent to a liver specialist,” explained Dow. “This really allows the lab to have an impact on patients with liver disease.”

The intelligent liver function testing (iLFT) initiative was tested for a year before going live at NHS Tayside’s Ninewells Hospital. Implementation involved a five-step process: 1) general practitioner (GP) chooses iLFT over standard LFT; 2) GP enters patient data for alcohol consumption, BMI, and features of metabolic syndrome; 3) if basic testing is outside defined parameters, the automated reflex cascade of additional tests is enabled to further characterize etiology; 4) results are automatically populated into diagnostic algorithms to identify a relevant diagnosis and management plan; 5) a report is made available to the GP in real time for action with access to the management plan electronically via web hyperlink.

Since implementation of the iLFT protocol in August 2018, the likelihood of a correct diagnosis of abnormal liver results has increased 52%, from 41% to 93%. The testing identified 2,350 patients who were then treated, resulting in improved quality of life and a longer lifespan. The iLFT protocol also increased appropriate escalation of care following abnormal LFT results from 41% using the previous standard to 100%. Based on the results, the researchers determined cost avoidance of £3,216 per patient, for a total lifetime cost avoidance at Dundee of more than £7 million.

“By implementing this test, we have truly maximized the value of liver testing while improving quality of care,” said Dillon. “There’s a lot more integration of lab services.”

Transforming Care From Within
Each of these cases illustrates how interdisciplinary teams have a critical role to play in advancing patient care. The clinical laboratory not only performs high quality testing but is integral to developing new, integrated care practices that can improve current standards of care.

To learn about other UNIVANTS winners, go to univantshce.com.

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A GLOBAL PASSION FOR IMPROVING PATIENT CARE

The UNIVANTS of Healthcare Excellence Award recognizes teams who collaborate across disciplines to transform healthcare delivery and patient care. In its inaugural year, the teams being recognized come from seven countries around the globe.

WINNERS
» Intelligent Liver Function Testing: A Cost-Effective Way to Increase Early Diagnosis of Liver Disease, University of Dundee, Dundee, Scotland
  › John Dillon (cover, row 1, column 1)
  › Ellie Dow (cover, row 1, column 2)
  › Michael Hugh Miller (cover, row 1, column 3)
  › Elizabeth Furrie (cover, row 1, column 4)
  › Ian Kennedy (cover, row 2, column 1)
  › Jennifer Nobes (cover, row 2, column 2)

» Improving the Safety of Mothers and Babies Using Angiogenic Biomarkers for Preeclampsia, Oxford University NHS Foundation Trust, Oxford, England
  › Tim James (cover, row 2, column 4)
  › Manu Vatish (cover, row 3, column 1)
  › Matthew Covill (cover, row 3, column 2)
  › Julia Eades (cover, row 3, column 4)
  › Sofia Cerdeira (cover, row 4, column 1)

» Improved Diagnostic Pathway and Treatment for Hospitalized Patients With Acute Kidney Injury, Ernst von Bergmann Hospital with the Dialysis Center Potsdam and the Diaverum Kidney Care Center MVZ Potsdam affiliated with Otto-von-Guericke University Magdeburg, Magdeburg and Potsdam, Germany
  › Michael Haase (cover, row 4, column 3)
  › Elisabeth Engelmann (cover, row 4, column 4)
  › Jens Ringel (cover, row 5, column 2)

WITH DISTINCTION
» Improving Clinical and Quality Outcomes for Prenatal Care—A Clinical Laboratory Driven Initiative, TriCore Reference Laboratories, Albuquerque, New Mexico, U.S.

» The Global Impact of Troponin and Biomarker on Ischemic Myocardial Injury and Surgical Care, Hamilton Health Sciences/Population Health Research Institute, Hamilton, Ontario, Canada

» Identifying Untreated Hepatitis B and Hepatitis C via Opt-out Screening Program in Urban ED Setting, Guy’s and St. Thomas’ NHS Trust, London, England

» Improving Quality, Patient Care and Experience, While Lowering Costs Through Enhanced Laboratory Stewardship, Cleveland Clinic, Cleveland, Ohio, U.S.

» Avoiding Insufficient Therapies and Overdosing With Co-Reporting eGFRs for Personalized Drug Therapy and Improved Outcomes, Marienhospital, Stuttgart, Germany

» Optimization of Heart Failure Management Using Biomarkers in Patients With Low Risk for Rehospitalization, University Medical Center Groningen, Groningen, Netherlands

» FH ALERT: Identification of Patients With Familial Hypercholesterolemia by Using the Expertise and Resources of the Clinical Laboratory, SYNLAB Holding Deutschland GmbH, Augsburg, Germany

WITH ACHIEVEMENT
» Maximizing Patient Care in a Cost Conscious Environment, Palestinian Medical Technology Association, Ramallah, Palestine

» Increased Population Engagement, Enhanced Patient Experience and Safe Blood Donations Through Strategic Partnerships and Targeted Media Campaigns, Dubai Health Authority, Dubai, United Arab Emirates
If you and your teams have achieved measurably better healthcare performance through teamwork and AVANT-GARDE processes, submit your best practice to the UNIVANTS of Healthcare Excellence Award program. Winning teams receive local and global recognition with the opportunity to inspire others across the globe.

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