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Clinical Laboratory News

SAVING TIME



3 hours, 35 minutes
Reduction in length-of-stay
for mTBI patients
when using S100B

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Working smarter through innovative lab initiatives

BY KIMBERLY SCOTT

Clinical laboratories worldwide are working together to improve patient outcomes, become more efficient, and develop innovative life-saving initiatives that demonstrate the power of collaboration.

The three initiatives highlighted below are the 2025 top elite winners of the UNIVANTS of Healthcare Excellence awards. Two of them tackled how to improve patient flow in emergency departments, while the third identified a gap in care, connecting patients who test positive for hepatitis C with critical treatment.

These prestigious honors were created by Abbott in partnership with the Association for Diagnostics & Laboratory Medicine (ADLM, formerly AACC) and other leading healthcare organizations, including the Healthcare Information and Management Systems Society and Modern Healthcare. The awards recognize healthcare teams that unite across disciplines, challenging the status quo with avant-garde problem-solving

and novel use of laboratory insights to improve outcomes for patients, clinicians, payers, and health systems. In each case, clinical laboratories were a significant asset in developing and implementing the initiatives. This supplement explores the unique achievements of the top teams recognized this year.

DIAGNOSING PATIENTS WITH MILD TRAUMATIC BRAIN INJURY

Globally, an estimated 69 million people experience traumatic brain injury (TBI) each year. While the majority of TBIs are mild to moderate in severity, a significant number lead to disability and substantial socioeconomic burden. The Americas and Europe have the highest investigated incidence of TBI, while Africa has the lowest.

Acute assessment of mild TBI (mTBI) patients remains a challenge worldwide, as there is a great deal of ambiguity in the definitions and diagnostic criteria for the condition.

Until recently, the only diagnostic method for evaluating patients with mTBI was a CT scan. Although most CT scans do not find abnormalities in those with mild injuries, the use of such imaging is recommended to avoid potential life-threatening complications caused by intracranial hemorrhage. Thus, patients who are ultimately diagnosed with a mTBI represent a large group of patients who likely did not need a CT.

In 2006, a German team demonstrated the potential for a blood biomarker called protein S100B to be used as a tool for assessing patients with a potential mTBI.

A team from the United States subsequently proposed a combined test involving glial fibrillary acidic protein (GFAP) and ubiquitin

carboxy-terminal hydrolase L1 (UHC-L1). These three biomarkers demonstrated excellent clinical performance, with a sensitivity of more than 95% to prevent false-negative results in TBI patient screening and a specificity of around 40% to minimize unnecessary CT scans. As a result, about 40% of mTBI patients can be excluded from needing a CT scan.

OPTIMIZING MANAGEMENT OF PATIENTS WITH MTBI USING S100B

The above research established the groundwork for a French team to integrate brain biomarkers into clinical practice for optimization of patient flow for patients with suspected mTBI, the initiative for which they received top elite honors associated with the 2025 UNIVANTS of Healthcare Excellence awards. Following publication of the German team's findings, the Centre Hospitalier Universitaire Clermont-Ferrand in Clermont-Ferrand, France, formed a consortium involving blood biomarkers. Their hospital was the first in France to implement S100B into clinical practice for the management of patients with suspected mTBI.

In 2022, Vincent Sapin, PharmD, PhD, professor of biochemistry and molecular biology at the Clermont Auvergne University and head of biochemistry and molecular genetics at the University Hospital of Clermont-Ferrand, helped to draft new national recommendations for patients with suspected mTBI, which validated use of the three biomarkers — S100B, GFAP, and UHC-L1. As a result, France became one of the first countries (after countries in Scandinavia) to

implement mTBI blood biomarkers into clinical pathways for patients with suspected mTBI.

According to Sapin, a recent review by the consortium demonstrated that the utilization of blood biomarkers for managing mTBI patients in the adult ED of Clermont-Ferrand University Hospital reduced length of stay by 3 hours and 35 minutes, cutting it from 10 hours and 38 minutes down to 7 hours and 3 minutes.

Prior to the introduction of blood biomarkers, the French guidelines for the management of mTBI patients at risk of intracranial lesions required that a CT scan be performed between 4 and 8 hours after the traumatic event. Among patients with mTBI, the total time saved for 411 patients equates to 1,473 hours (61 days) based on a time savings of 3 hours and 35 minutes per patient.

“Using these figures, the annual reduction in the length of stay at our university hospital's emergency department is approximately 96 days,” said Sapin.

Following the introduction of this new medical strategy of using blood biomarkers to rule out the need for a head CT in patients with suspected mTBI, the consortium conducted regular scientific analyses and communicated the results to the medical team during scheduled meetings. Their analyses were based on the demonstration by other well-known international teams that there were no false or unexplained negative detections of intracranial lesions after blood biomarkers were used to rule out such lesions rather than CT scans.

“In our hospital, 82% of clinicians strictly adhere to the use of S100B for mild TBI assessment,

Optimizing patient flow in France using biomarkers

3 hours, 35 minutes:

The reduction in length-of-stay for patients presenting to the emergency department with mild traumatic brain injury (mTBI) when biomarkers are measured.

5,184 euros: Cost savings resulting from 216 avoided CT scans.

2,300: Resource hours mitigated each year as a direct result of expedited patient flow from using biomarkers for mTBI.

The initiative is relatively easy to implement, said Sapin. He noted that switching from using CT scans to blood biomarkers for mTBI did not necessitate the creation of new infrastructure.

which supersedes published findings, denoting clinical adherence at 55%," said Sapin. "There is a notable increase in adherence to the guidelines in our hospital, with an estimated 22% following them at the beginning of the implementation period."

Implementation of the biomarker initiative for mTBI also helped address overcrowding in the emergency department (ED), according to Sapin, with 2,300 resource-hours mitigated each year as a direct result of expedited patient flow.

The involvement of the Clermont-Ferrand team at the national level, along with the communication of its significant role in the new French guidelines, demonstrates their sustained leadership not only as an early adopter but also as an educator for others.

"The designation of the department as the French National Reference Laboratory for the cerebral stress management of mTBI patients is also significant, as it allows for effective communication of this kind of labelling by the Minister of Health," said Sapin. "As the consortium continues to undertake a range of local, regional, national, and international research

projects, patients are informed about this dynamic aspect of their modern medical care when they arrive at the adult emergency department."

The shift from CT scans to blood-biomarker assessments has been proven to be cost-effective for patients with mTBI, according to Sapin. In France, the reimbursement price for a CT scan is 54 euros, while the price for an S100B test is approximately 30 euros. This equates to a cost savings of 24 euros per patient, resulting in a savings of 5,184 euros annually based on 216 mitigated CT scans.

The initiative is relatively easy to implement, said Sapin. He noted that switching from using CT scans to blood biomarkers for mTBI did not necessitate the creation of new infrastructure. In fact, it only required that the laboratory be able to measure S100B or GFAP and UCH-L1. The ease of implementation is primarily due to the widespread availability of these biological assays in most in vitro diagnostic settings.

By becoming a National Reference Medicine Laboratory for France, Clermont-Ferrand University Hospital Laboratory was able to disseminate and utilize these

biomarker tests, said Sapin, who noted that the clinical care initiative is highly scalable. The clinical performance of blood biomarkers in the management of mTBI patients provides clinicians with high confidence in this strategy. In addition, the publication of new French guidelines for the management of mTBI patients provides legal protection for clinicians.

IMPROVING MTBI ASSESSMENTS USING A COMBINATION OF GFAP AND UCH-L1

A team from Hospital Universitario Nuestra Señora de Candelaria, the largest acute care hospital on the Canary Islands, also received top elite honors associated with the 2025 UNIVANTS of Healthcare Excellence awards for their initiative to implement brain biomarkers to increase patient safety and improve length of stay for patients with suspected mTBI. The hospital sees an average of 1,600 TBI patients per year, many of whom undergo CT scans, according to Pilar González Romero, MD, PhD, a family medicine physician at the hospital. While most of these patients have mild impairment and are discharged from the ED without significant intervention, the practice

of CT scanning resulted in these patients spending an average of 9 hours in the ED, said Romero. In addition, the CT scans exposed patients to radiation, which is associated with an increased risk of cancer.

The hospital laboratory worked closely with the ED team and other clinical departments to introduce a novel TBI test to exclude patients who were at low risk of having intracranial lesions and who likely did not need a CT scan. The test uses two biomarkers — GFAP and UCH-L1 — to determine if a CT scan is necessary.

The hospital introduced the TBI test into the clinical care pathway at the end of 2022. Since then, over

5,000 patients have been evaluated using the TBI biomarker tests in the ED. The test is used within 12 hours of head injury in patients with mTBI being evaluated for a possible head CT. A negative result can help avoid unnecessary CT scans, while a positive result suggests that a CT scan may be needed to rule out intracranial hemorrhage.

Data extracted based on a subset of patients demonstrated a 36.8% reduction in CT scans, representing an annual savings of 4,490 hours of radiologist work, in addition to savings in patient transport by orderlies and the work of the technicians performing the image acquisition, Romero said. The estimated cost savings in the hospital is 274,000 euros.

Thanks to the test's high negative predictive value, negative biomarker results enable doctors to safely discharge patients without the need for a CT scan. Consequently, the average ED length of stay was reduced from 8.7 hours to 4.5 hours for emergency patients who did not require admission or observation.

Use of the test improved clinicians' confidence in TBI assessment and clinical care decisions. A survey of ED doctors using the TBI test found it useful for their clinical practice by reducing uncertainty, streamlining clinical workflows, and contributing to more personalized medicine.

"Before, I used to have doubts with certain patients, especially if they were young or had a Glasgow score of 15," said Saray Fernández Pérez, an ED physician. "The implementation of the test and the protocol has been a turning point in the management of mild TBI. The TBI test facilitates the evaluation

and early discharge of my patients."

While the TBI test is included in the Spanish Emergency Medicine Society's recommendation, Hospital Universitario Nuestra Señora de Candelaria was the first to introduce the novel test into clinical practice in the Canary Islands, serving as inspiration to others, said Romero. After establishing the mTBI testing initiative at Hospital Universitario Nuestra Señora de Candelaria, the interdisciplinary team worked with a smaller hospital, Hospital del Sur, located 77 kilometers from the main hospital. Previously, the smaller hospital referred patients in need of specialist assessment and care to the main hospital. The test was successfully introduced in Hospital del Sur in February 2024 and resulted in nearly a 40% reduction in CT scans, less time in the ED for mTBI patients, and a decrease in the number of transfers to the central hospital. The initiative also increased physicians' confidence and improved communication between the two hospitals, and has inspired an additional 8 sites to begin implementing this pathway.

"Ultimately, the goal is to enhance patient safety, streamline ED workflows, and support clinical decision-making with reliable biological data," Romero said.

The success of the TBI initiative could not have been achieved without the integrated teamwork and insightful laboratory data that help to drive decision-making. "By combining laboratory results with clinical context, we were able to make more informed decisions, streamline care processes, and ultimately improve patient outcomes," said Romero. "This approach allowed for timely, evidence-based

Using mTBI biomarkers in Canary Islands

5,000: Number of TBI biomarker tests conducted in the emergency department (ED) of Hospital Universitario Nuestra Señora de Candelaria since the initiative was introduced at the end of 2022.

4.2 hours: Reduction in average ED stay for TBI patients who did not require admission or observation.

274,000 euros: Cost savings resulting from a 37% decrease in CT scans in patients with mTBI.

The implementation of the test and the protocol has been a turning point in the management of mild TBI.

interventions that were critical to the initiative's success."

EXPANDING TREATMENT FOR VIRAL HEPATITIS

Viral hepatitis is the second leading infectious cause of death globally, with 1.3 million deaths per year, according to the World Health Organization (WHO). WHO's 2024 Global Hepatitis Report estimates that, as of 2022, 254 million people were living with hepatitis B (HBV), and 50 million live with hepatitis C (HCV).

Despite advancements in clinical tools and decreasing product prices, testing and treatment coverage rates for viral hepatitis have stalled, according to WHO, which has a goal of eliminating the condition by 2030.

In Japan, an estimated 1 million to 1.5 million people are infected with HCV, and approximately 300,000 of them are unaware of their infection. In addition, there is a challenge in connecting patients who screen positive for HCV to appropriate care. Musashino Red Cross Hospital plays a central role as a regional core center for liver-disease treatments in Tokyo and actively promotes hepatitis countermeasures.

As one of these efforts, the hospital identified patients who have tested positive for HCV antibodies in preoperative tests with recommendations that they consult gastroenterology so they can be linked with appropriate care. In 2015, the hospital began using an alert system for electronic medical records. However, alerts alone were not enough to encourage clinicians to respond, thus in 2021, the hospital began an initiative to identify HCV-positive patients using a laboratory-compiled list, while also implementing new processes for follow-up that link patients to care and treatment.

The list, which identified positive cases once a week, was delivered to the Liver Disease Consultation Center, according to Nobuharu Tamaki, MD, PhD, a physician in the department of gastroenterology and hepatology and leader on this UNIVANTS of Healthcare Excellence award-winning team. Hepatitis coordinators then followed up with the positive cases, followed by therapeutic intervention by specialists. The system for managing these patients also involved an application prompting medical offices to

request subsidies covering the cost of hepatitis-related expenses.

"An alert system for the extraction of HCV antibody-positive patients and calls to the attending physician were not sufficiently effective," said Tamaki. "Therefore, we started to use hepatitis coordinators and conduct individual follow-up. It is significant that coordinators from various professions collaborated to build each step of the process."

From 2023, the initiative was certified as an official project of the hospital, involving a wide range of professions, such as doctors, nurses, and staff of the Medical Information Management Division. The clinical laboratory team manages the entire collaboration. It led to a 33.7% decrease (from 34.8% in 2020, to 3.1% in 2023, to 1.1% in July 2024) in the percentage of patients with HCV-antibody positivity who had not been referred for appropriate care.

According to repeated briefing sessions on the project in the hospital, 94% of hepatologists consider the current clinical-support system with a multidisciplinary hepatitis coordinator to be valuable.

Clinicians in other departments have also changed their behavior after learning more about HCV. The proportion of clinicians who checked or measured their treatment history in their own department increased from 17.5% in 2022 to 23.7% in 2023.

“As clinicians proactively ordered tests and made referrals to gastroenterologists only when appropriate and in response to HCV antibody results, the number of cases requiring gastroenterological intervention was clearly reduced,” Tamaki said. “This indicates that the HCV-antibody-positive patient identification project has improved clinicians’ understanding of the importance of HCV antibody testing and promoted behavioral change among physicians.”

Developing such initiatives in various locations and promoting micro-elimination of hepatitis in each region is an important shortcut to hepatitis elimination.

The Musashino Red Cross Hospital has a high number of patients with liver-related diseases at the national level and the second largest number of such patients in Tokyo. Multidisciplinary hepatitis coordinators are important for the effective treatment of HCV antibody-positive patients. The initiative emphasized the importance of identifying hepatitis cases through multidisciplinary hepatitis coordinators, thereby enhancing clinicians’ understanding within the hospital, explained Namiki Izumi, the honorary president and former president of the hospital.

“By sharing issues and challenges encountered during the process, we improved multidisciplinary collaboration across functions, promoting problem-solving and experience-sharing,” Izumi said. “This approach reinforced teamwork, boosted morale, and led to enhanced staff satisfaction with the problem resolution process.”

The initiative also contributes to cost savings for the hospital due to the reduction of liver cancer, since

adequate treatment of hepatitis C helps mitigate the development of hepatocellular carcinoma. A study on liver-cancer treatment estimates that the average medical cost of chemotherapy was 7.74 million yen (about US\$55,000). HCV infection causes chronic hepatitis in about 70% of people and liver cancer in 6% to 8%, according to experts.

Assuming that 70% of the 108 people who received intervention through this initiative developed chronic hepatitis C, and 8% of them (six people) developed liver cancer, the mitigated costs associated with early intervention is 46.4 million yen (about US\$330,000).

“Connecting patients with hepatitis C to the right treatment is meaningful not just for patients, it can significantly reduce medical costs,” said Tamaki. “In addition, the promotion of micro-elimination in each region will have a positive impact on the whole world by activities that lead to the eradication of hepatitis.”

Tamaki suspects that this initiative could be moderately easy to

Expanding treatment for viral hepatitis in Japan

300,000: Number of people in Japan with hepatitis C who are unaware that they are infected.

34.8% to 1.1%: Decrease in percentage of antibody-positive patients who required referral to gastroenterology following launch of initiative.

45.4 million yen: Cost savings from early intervention preventing development of chronic hepatitis and liver cancer.

implement at other institutions. While the need for interprofessional teams is increasing in all aspects of healthcare, such collaboration can also be difficult, he explained. In addition, progress in hepatitis treatment has been remarkable, and the knowledge base varied among the members of the team.

“Under these circumstances, each occupation related to this project acquired the qualification of a hepatitis medical coordinator, which enabled them to have a common understanding of the knowledge and necessity of hepatitis medicine,” he said. “In the future, we plan to build a system to pick up more efficiently and reliably by using robotic process automation.”

While the initiative required the development of a new process,

it did not require a large capital investment, according to Tamaki, who notes that it is relatively easy to adapt the capabilities of existing laboratory information systems and hospital information systems to other facilities and projects. There are 91 Red Cross hospitals in Japan, some of which the team at Musashino plans to target for expanding this initiative.


“Developing such initiatives in various locations and promoting micro-elimination of hepatitis in each region is an important shortcut to hepatitis elimination,” he said.

TRANSFORMING PATIENTS’ LIVES

Each of the initiatives highlighted above demonstrate that laboratory medicine is a key partner in improving health outcomes and

savings lives throughout the world. Beyond providing test results, lab experts increasingly take an active role in integrated teams, offering insight and data vital to their success. The UNIVANTS of Healthcare Excellence award program illuminates the exceptional teams that are transforming the landscape of medical practice.

The winning teams will receive a physical award, plus the exclusive title, “UNIVANTS of Healthcare Excellence Award Winner.” They will also be given opportunities to share more about their initiatives, including an invitation to share their best practices at an exclusive leadership forum.

To learn more about the UNIVANTS of Healthcare Excellence award program, visit UnivantsHCE.com. 

UNIVANTS 2025 TEAMS RECOGNIZED IN THIS ISSUE

TBI strategies: Expediting patient flow and reducing length of stay through blood biomarker-guided management of patients with suspected mild traumatic brain injury

**Centre Hospitalier Universitaire
Clermont-Ferrand
Clermont-Ferrand, France**

Vincent Sapin
Charlotte Oris
Bruno Pereira
Damien Bouvier
Jeannot Schmidt

Radiation reduction: Increased safety and improved length of stay for patients with suspected mild traumatic brain injury in the emergency department

**Complejo Hospitalario Universitario
Nuestra Señora de Candelaria
Santa Cruz de Tenerife, Spain**

María Teresa Concepción Masip
Pilar González Romero
María Cecilia Martín Fernández de Basoa
Mónica Fernández del Castillo Ascanio
Carlos Alberto Marichal Hernández

The pathway to HCV elimination: Multidisciplinary team effort for improved identification, diagnosis, and treatment of HCV positive patients

**Musashino Red Cross Hospital
Musashino, Japan**

Maki Furuya
Nobuharu Tamaki
Noriko Kubota
Marina Muneyama
Masayuki Kurosaki

**The Pathway to
HCV Elimination:**
Multidisciplinary Team
Effort for Improved
Identification, Diagnosis
and Treatment of HCV
Positive Patients
Musashino Red Cross Hospital

**Radiation Reduction: Increased
Safety and Improved Length
of Stay for Patients with
Suspected Mild Traumatic
Brain Injury in the Emergency
Department**
Complejo Hospitalario Universitario
Nuestra Señora de Candelaria

**TBI Strategies: Expediting
Patient Flow and Reducing
Length of Stay through
Blood Biomarker Guided
Management of Patients
with Suspected Mild
Traumatic Brain Injury**
Centre Hospitalier Universitaire
of Clermont-Ferrand



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