InnoBuyer
FAST TRACK TO INNOVATION PROCUREMENT

CHALLENGER

Hospital General Universitario Gregorio Marañón

SOLVER

eB2

ALSO FUNDED BY THE EIC

European Innovation Council

INNOBUYER IMPACT STORIES:

OPEN CALL FOR SOLVERS

EARLYDEL

Wearable system for the early detection of delirium or agitation in patients

Innobuyer collaborated with public institutions (challengers) to identify their unmet innovation needs and select suitable SMEs (solvers) to address them. The matched teams co-created pilot solutions over a 10-month period. Following successful pilots, challengers received support from Innobuyer and experts to design simplified ToR. Each project was backed by €100,000 in financial support—€41,500 for the challenger and €58,500 for the solver.

THE NEED

The Hospital General Universitario Gregorio Marañón (HGUGM) is the largest public hospital in the Community of Madrid, serving over 2 million people.

One of the challenges faced by hospitals everywhere is managing delirium—a sudden state of confusion that often includes disorientation, agitation, and even hallucinations. It affects between 12.5% and 30% of patients over the age of 65, and can lead to serious consequences: longer hospital stays, higher risk of falls and complications, worse outcomes, and distress for both patients and their families.

The good news is that 30% to 40% of delirium cases are preventable if identified early. That's why the hospital's nursing department set out to **improve early detection and prevention of delirium among hospitalized patients.**

THE SOLUTION

Tech start-up Evidence-Based Behavior (eB2), known for its AI-driven tools for monitoring behavior, partnered with the hospital to develop a smart solution. Building on their MindCare system, eB2 created an **automated tool to manage delirium risk** throughout a patient's hospital stay.

Using machine learning, the system analyzes data from Electronic Health Records along with nurse and physician assessments to predict which patients are at risk of developing delirium.

Nurses receive real-time updates and tailored risk alerts, helping them take action before symptoms appear. A visual dashboard also helps clinical staff understand each patient's situation and guides them in applying the right preventive measures.

IMPACT

Earlydel showed how artificial intelligence (AI) can help keep older hospital patients safer. The project analysed data from over 12,000 hospital stays and nearly a million medical records from 2019 to 2023, focusing on patients over the age of 65.

The goal was to train AI models to predict common hospital incidents—like delirium (sudden confusion), patient agitation, device removal, and falls—which often lead to longer hospital stays and added risks. The system was trained using patient information such as age, test results, and health assessments.

The AI was able to accurately identify patients at risk

- Delirium prediction was 90.8% accurate.
- Agitation prediction reached 86.9% accuracy.
- Device removal prediction showed 85.49% accuracy.
- Fall prediction was 84.7% accurate.

Importantly, the study showed that these incidents often occur together or trigger one another, especially within the first 48 hours of admission. Patients who developed delirium stayed in the hospital on average 2 days longer than those who didn't.

This technology could help hospital staff take early action, reducing complications and improving care for older adults—while also saving time and hospital resources.

> "THE PROGRAM IS POISED TO HAVE A POSITIVE IMPACT ON BOTH THE QUALITY OF PATIENT CARE AND THE WORK EFFICIENCY OF CLINICAL STAFF, WITH **BENEFITS THAT COULD EXTEND BEYOND THE HOSPITAL WHERE IT IS INITIALLY IMPLEMENTED, FAVORABLY AFFECTING THE HEALTH SECTOR AS A WHOLE.**"

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