Unleashing comprehensive, holistic and patient-centric stroke management

A real-world federated data platform across seven top-tier European hospitals, training artificial intelligence on harmonised data that stays in the hospital.

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7	7	11	>14,000
European hospitals	European countries (clinical + industry)	Work packages	patients at recruitment completion*

Data privacy and sovereignty by design. The AI models travel between sites, patient data never leaves the hospital

THE CHALLENGE · fragmented care, isolated data

Incomplete care pathways
different workflows, no standardised diagnostics for aetiology or prevention

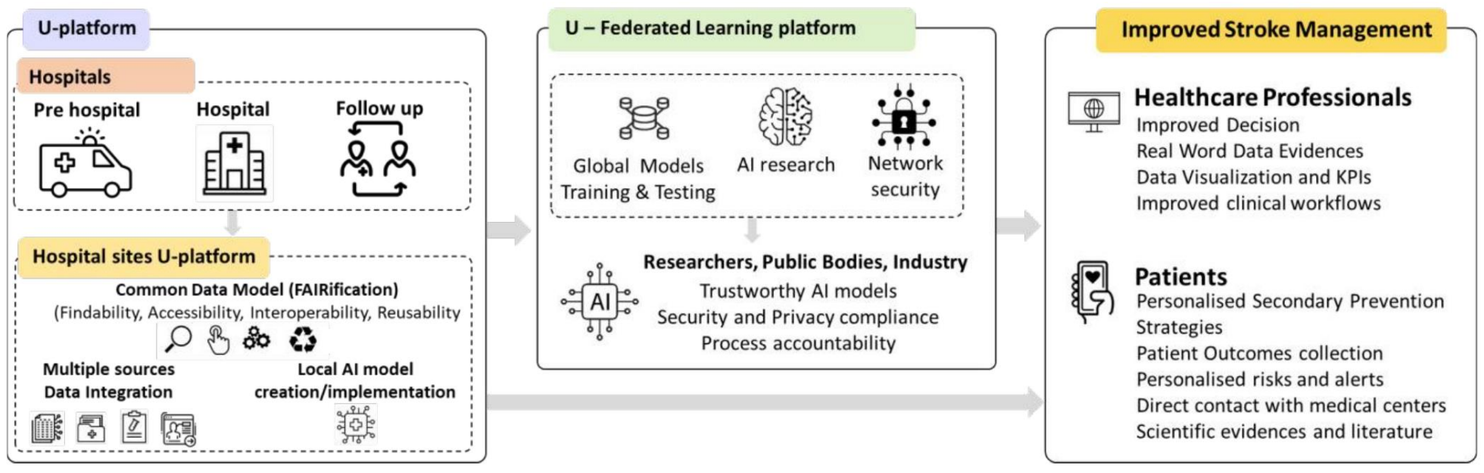
Isolated data
confined to local, non-interoperable systems, limited in scope and collaboration

Unexplained strokes
a third of cases lack a clear cause, 11% recur within one year

2nd
most common cause of death worldwide

+27%
more EU stroke survivors by 2047

THE UMBRELLA APPROACH · from local data to improved stroke management



UMBRELLA project workflow: local real-world data are harmonised through a common data model at each hospital site, AI is trained across sites on the federated learning platform, and the results return to clinicians and patients as improved stroke management.

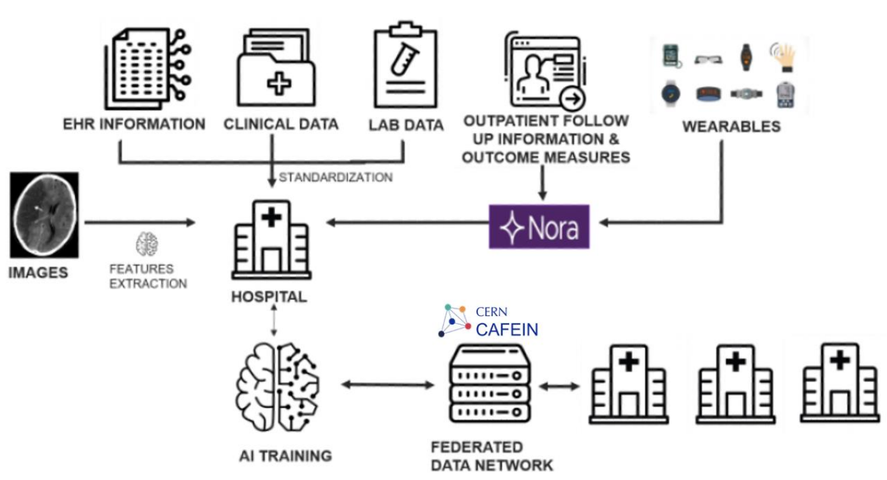
European collaboration
7 centres, 7 countries, clinical, industry and technology partners

Interoperable by design
OMOP common data model, FAIR and GDPR compliant

Privacy and sovereignty
AI trained locally, aggregated centrally, data stays on site

Patient-centric follow-up
Nora app for PROMs, PREMs and remote rehabilitation

HARMONISED PROSPECTIVE DATA · OMOP as the common data model for FEDERATED LEARNING



The common data model is the harmonisation tool

All seven centres map their data to the **OMOP Common Data Model** (Observational Medical Outcomes Partnership), transforming diverse hospital databases into one unified format with common terminologies, vocabularies and coding schemes. HL7 FLIR carries information between digital systems.

Standardisation · Integration · Harmonisation · Refinement · Implementation

FAIRification: Findable, Accessible, Interoperable, Reusable

Acute stroke / TIA care · Hospitalisation & work-up · 90-day outcomes · 12-month follow-up

TWO BUILDING BLOCKS · work packages 5 and 6

Multicentre · observational · non-interventional · standard of care · recruitment Oct 2026 to Feb 2028 · follow-up to 12 months · real-world evidence

WP5 · TIA & MINOR STROKE

AI to guide patient discharge and follow-up

Turning heterogeneous TIA and minor-stroke care into one evidence-based pathway.

- Harmonised acute care pathway across hospitals
- Innovative acute neuroimaging: relative-NCCT and photon-counting CT
- Risk models for stroke recurrence, adherence and readmission

Target cohort: 2,400 patients*

WP6 · CARDIAC EVALUATION

Multimodal AI to uncover cardioembolic sources

Detecting hidden cardioembolic mechanisms after stroke.

- Cardiac CT in hyperacute stroke to detect cardiac thrombus
- Extended ECG and implantable loop recorders to reveal occult AF
- Blood biomarkers and a shared European biobank

Target cohort: 4,950 patients*

MY CONTRIBUTION AND EARLY RESULTS · WP5 harmonisation

Lucas Fache · WP5

- Harmonisation lead: leading harmonisation across clinical centres
- Prospective protocol development: drafting the prospective study protocol
- PROMs and PREMs implementation (Nora): prioritisation and selection
- Prospective study coordination: patient inclusion, case manager training

Early progress: harmonising the TIA and minor-stroke protocol

7	vs ESO	8	1
protocols collected from all centres	benchmarked against ESO guidelines	decision points of variation*	consensus-harmonised protocol

*e.g. thrombolysis in basilar occlusion, blood pressure and glucose targets, cardiac work-up, CYP2C19 testing, DOAC restart timing, carotid intervention and monitoring duration, each resolved by expert consensus.

VALUE OF THE IHI PARTNERSHIP · CAREER IMPACT

WHY A PUBLIC-PRIVATE PARTNERSHIP WAS ESSENTIAL

- Technology and academia collaboration: photon-counting CT (Siemens Healthineers), ECG AI (Philips Cardiologs), federated infrastructure (CERN CAFEIN®)
- Scalability: one harmonised protocol, seven centres, six countries, >14,000 patients
- Privacy preservation: shared GDPR, ethics and regulatory pathway, with EATRIS support

CAREER IMPACT

UMBRELLA has shown me what AI in stroke care can become when clinicians, data scientists and industry work towards a common standard.

Leading the harmonisation of care protocols across seven European centres required implementation science, data governance and the work of building clinical consensus. These competencies shape how I approach both patient care and research leadership.

Consensus leadership · Implementation science · Federated AI and data · Cross-sector collaboration

*Total expected patients at recruitment completion (sum of the per-site totals, UMBRELLA-P protocol). Work-package figures are not additive: many patients contribute to more than one work package.

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