ELECTRONIC VASCULAR ACCESS PASSPORT

A digital tool to support home management, documentation, and communication for patients with vascular access devices

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Background & Aim

Vascular access devices are increasingly managed outside hospital settings, where continuity of information and prompt expert support are often fragmented.
Aim: to design a smartphone app that improves home management of vascular access devices, supports expert nursing follow-up, and reduces complications related to poor management

Methods

Literature review performed in April 2025 using PubMed, CINAHL Complete, and Google Scholar.
Research question: in patients with vascular access, can an app-based tracking system improve device management for patients and healthcare professionals?
PubMed search yielded 24 records; after screening, 3 studies were included.

Evidence Base

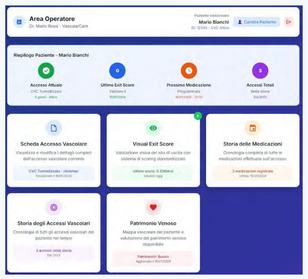
Included studies: Meu PICC usability study (2022), WeChat systematic review/meta-analysis (2018), IV Passport co-creation study (2024).
Findings across studies: better self-management, improved satisfaction, moderate reduction in complications, and stronger continuity of care.
Main limitations: small samples, heterogeneous tools, limited integration with electronic health records, and restricted language/geographic adoption.

App Concept

The proposed Electronic Vascular Access Passport is a bidirectional app with dedicated areas for healthcare professionals and for patients/caregivers.
It tracks implantation, dressing changes, flushing, complications, interventions, and device removal, while preserving vascular history over time.
The platform also supports chat, photo sharing, QR-code identification, alerts, and structured follow-up for home care.

Core Functions

Professional area: patient selection, approval of home dressings, chat, editable vascular access record, Visual Exit-Site Score, dressing history, vascular history, venous heritage mapping.
Patient area: educational information, “My vascular access” section, QR code, self-reported dressing log, complication reporting with photos, appointments, useful contacts, chat.
Secure access is envisioned through SPID or electronic identity systems to ensure traceability and univocal identification.



Workflow

Implantation recorded → Home care tracked

Photos/chat reviewed → Complications managed early

Expected Benefits

Reduced loss of information when patients move across services.
Greater patient empowerment and easier access to expert advice.
Earlier recognition of exit-site problems and other complications.
Potential reduction in unnecessary travel, particularly in geographically difficult areas.

Context

The thesis highlights the relevance of this tool in Piedmont, where access to referral centres may be difficult in rural and mountain areas.
Digital support may improve continuity of care within a regional network serving 4.4 million inhabitants.

Challenges

Development and maintenance costs.
Ethics approval and validation pathway.
Privacy and sensitive-data protection.
Digital literacy and compliance, especially in older users.

Conclusion

An Electronic Vascular Access Passport could standardize home VAD management, support communication between patients and experts, and improve safety through structured documentation and early intervention. The next steps are prototype development, validation, ethics approval, and integration with electronic medical records.

Keywords: central venous catheters; vascular access devices; PICC; midline; mobile applications; home care; digital health