

RESEARCH LETTER

Design and Use of an Interactive Online Registry to Track and Illustrate Vascular Surgery Practice in Greece

In January 2019, the Hellenic Vascular Registry (HEVAR) was created among public and private hospitals in Greece. Within a few months the majority of vascular surgery departments and units in Greece were enrolled and started to input data. To date, vascular surgery and interventional radiology departments from eight out of 12 academic hospitals, four of six non-academic state hospitals, and two of four military hospitals are participating. Furthermore, vascular surgeons from four private hospitals have been registered. HEVAR currently offers three registry modules: "Aortic Aneurysm Disease"; "Carotid Artery Disease"; and "Lower Limb Ischaemia".¹ All modules allow data capture for both open and endovascular procedures following a standardised protocol,² which is based on European guidelines on registering vascular data.^{3,4} HEVAR is funded and run under the auspices of the Hellenic Society of Vascular and Endovascular Surgery.¹ Since May 2019, HEVAR has been a member of Vascunet.⁵

HEVAR has been developed on a web based platform (<https://vascularregistry.gr/registry>) after customisation of a content management system software (Interactive tools.com, inc, Vancouver, BC, Canada). Every registered user receives a unique username and password, which he/she uses to log in and input data for each clinical case. Each user has access to his/her own data exclusively. The only exception exists when a hospital or department gives permission to a specific user to have access to all the department's data. A separate record is created for every patient's individual admission, where all clinical details, treatment, and outcomes are included. Patients' follow up is also available in HEVAR. To enhance users' consistency on follow up, automatically generated reminding emails are sent at specific time-intervals to the users. HEVAR's users are also allowed to upload and store other types of data, such as images and PDF files, according to their preferences. The application is built on a responsive, mobile friendly format, so it can be used easily with a smartphone or a tablet, allowing data capture and modification "on the go" (see Table 1).

European Union (EU) General Data Protection Regulation (GDPR) compliance rules were taken into consideration in the design of HEVAR. HEVAR is governed by a Steering Committee, which serves both as Data Controllers and Data Processors in the GDPR compliance plan. As Data Controllers, and in order to be consistent with EU GDPR rules, HEVAR has implemented three actions: (i) a department or unit can participate in HEVAR, as long as the Ethics

Committee or the Institutional Review Board of the local hospital officially approves this participation; (ii) registered physicians have to declare that they have understood and agreed with the terms and rules of HEVAR; and (iii) HEVAR obtains clear and unambiguous consent from patients before collecting their data, which is a prerequisite for full inclusion and participation in the database. As Data Processors, the HEVAR Steering Committee is responsible for keeping patient records, processing data activities, and ensuring appropriate security measures are in place

A part of registering data, an online interactive dashboard is available in HEVAR (<https://vascularregistry.gr/dashboard>). This dashboard was developed to offer treating physicians, researchers, public health authorities, and the general public the ability to track vascular surgery procedures in Greece with user friendly tools. In HEVAR's dashboard, one can find real-time reports of HEVAR modules, as well as illustrations regarding the participating hospitals activities, the types of treatment in the various modules, and other clinical statistics. The dashboard's graphical interface uses various types of diagrams such as line diagrams, bar charts, pie charts and maps. Diagrams' data are automatically updated on an hourly basis.

Given the popularity and impact of registries and dashboards, our plan is to continue hosting and managing the tool, building up its capabilities, in order to establish a standing tool for monitoring and reporting contemporary vascular surgery practice in Greece.

Table 1. Main characteristics of the Hellenic Vascular Registry (HEVAR)

| Feature | Implementation |
|-------------------------------------|---|
| Platform | Customisation on a content management system builder software (www.interactivetools.com) |
| Design | Responsive platform/mobile friendly |
| Dashboard options | Real time measurements Charts/maps/diagrams |
| Data collection | Consistent with Vascunet guidelines |
| GDPR compliance/ data protection | 1. Hospital Ethics Committee/Institutional Review Boards approvals 2. Participating Physician's acceptance of rules and terms 3. Patient's consent 4. Username/password secure login |
| Validation | Internal: local administrative committees (pending) External: HEVAR Validation Committee (pending) |
| Funding | Hellenic Society of Vascular and Endovascular Surgery |

GDPR = General Data Protection Regulation.

CONFLICTS OF INTEREST

None.

FUNDING

None.

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