

Thomas Schmitz-Rixen

# Editorial

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Research in vascular medicine mainly involves developing drugs and prosthetic devices as well as conducting clinical outcome research and basic science to gain knowledge about vascular biology. But there is more. In the current issue several projects divulge how research and development in the vascular field extends beyond these bounds.

It is admirable and support-worthy when researchers invest time and resources outside mainstream research to improve endovascular treatment of complex aortic and peripheral artery disease. So please look at the superb work of Verónica García-Vázquez et al. about navigation and visualization with HoloLens in endovascular aortic repair. This technique involves electromagnetic tracking to guide EVAR intervention in real-time. A sensor is attached to the catheter tip and displays information on Microsoft HoloLens glasses. Success and procedural speed lead to less radiation exposure of both patient and operator.

Anna Christin Bakenecker et al. are working on a new medical imaging technique, enabling three-dimensional (3D) real-time imaging of a magnetic tracer material. Although not yet in clinical use, it is highly promising, especially for vascular and interventional imaging, as harmful ionizing radiation is not necessary.

Anna Duprée et al. provide a state of the art review on using indocyanine green fluorescent imaging (ICG-FI) to intraoperatively assess microperfusion, both as a quality control and as a diagnostic modality.

Renee M. Maina et al. present a comprehensive review about generating vascular conduits, whereby advancements from tissue engineering to 3D bioprinting are described. This opens the much needed area of biologic grafts in daily practice.

Thomas Aper et al. provide an original paper about long-term storage of biological grafts, employing technology recently introduced into our home kitchens. The stored material maintains its biomechanical properties.

Inez Torres et al. from Brazil use 3D printing of the real aorta to simulate and train for complex endovascular procedures, just before the actual procedure. This technique facilitates improved surgical planning, especially for complex endovascular procedures, and allows the construction of efficient simulators for endovascular training to improve residents' surgical performance and self-confidence.

Even single small contributions can dramatically change the way we work and the treatment we give. Therefore, it is definitely worth our while to be aware of innovation and invest resources to develop them, even without immediate economic gain. Quality control will determine whether these new diagnostic and therapeutic modalities become established. And it may pay off. ETH Zürich economists have demonstrated that every Swiss franc invested in the ETH returned a value of 5 francs to the Swiss national economy. All the new technology described in this issue is highly innovative and has the potential to become standard care and pay the investment back.

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