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# Smart Circulator or Value-Driven Perspective for Patients?

## Thoughts on the ethics of the digital transformation of cardiology

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Cardiology is a discipline with many opportunities; however, replacing the physician is ethically impermissible and machines must follow the measure of ethics. Only then can smart cardiology save and improve lives and make an important contribution in the world.



### Key Points

- Smart medicine, like all other technological innovations, must serve humanity.
- Ethical discourses and insights and corresponding consequences for action are necessary, as well as clear information for system professionals and patients alike.
- Smart cardiology is not charlatany; it is an important step towards a better, error-reduced, safer medicine; a medicine that draws its social license to heal from a critical-open assessment of digital technologies and their medical use.
- Cardiology is a discipline with many opportunities and a corresponding responsibility to contribute to a modern, digital, effective and ethical medicine.

### Smart Medicine, Like all Other Technological Innovations, Must Serve Humanity

392 years ago, after more than 1,400 years, Galen's theory of the humors was replaced in an almost revolutionary way by a scientific treatise on the circulation of the blood - "Exercitatio anatomica de motu cordis et sanguinis in animalibus" (An Anatomical Exercise Concerning the Motion of the Heart and Blood in Animals) - by the English physician and anatomist William Harvey (although the first edition was published only 12 years after it was written, in poor quality and even with printing errors). Harvey was derided as a "circulator" (an ambiguous name that alludes to the circulation of the blood and to the Latin term of abuse "charlatan"), and his view of the heart as a central switchboard was not initially a success story, despite all the fact-oriented research geared to modern experimentation. For Galen's quasi one-way theory

of blood flow was a de facto 16th-century mindset that blood would be continuously produced in the liver, from which it would flow through the body and be consumed by the flesh. Valuable time passed before these new medical insights were ultimately accepted by patients, but also in the training of medical professionals. Of course, questions of medical ethics were also discussed during these days: Is it an unacceptable risk for patients to make these new approaches around the heart and the blood circulation in the concrete care, usable? Is this research, which is new in the Renaissance, a serious scientific procedure?

Diagnostics is constantly discovering new procedures, non-interventional methods are advancing the field, and cardiology is digital. Always technology-savvy, but now in the age of the digital transformation of medicine increasingly a digital parade discipline. Catheter techniques are being innovatively



developed, and the often difficult image situation in the operating room in particular is being improved with new hybrid forms. In this way, treatment for patients is developing in a thoroughly positive way overall. Common diseases affecting heart valves, cardiac rhythm, heart failure or coronary forms. Today, many clinical pictures benefit from digital innovations on the basis of evidence. In the Smart Hospital, Smart Cardio is a driver, so to speak. What is the perception and evaluation of this new revolution in postmodernity today?

To be sure, the research revolution of the 16th and 17th centuries is not simply identical with the data-driven, AI-oriented, and significantly accelerated opportunities - but also risks(?) - of today's further development of medicine. There is much to be said for seeing in digitisation a develop-

If the digital transformation of cardiology itself is accompanied ethically and critically, if humanity and patient outcomes are in the foreground, and if innovations are welcomed with appropriate care where they help, this development is legitimate. Digitisation is not an end in itself, but it has the inherent tendency to suggest precisely this end in itself to those who unquestioningly consider the accelerating infinitesimalism of the digitally economised world to be the first principle. Digitisation can, however - and medicine, with its professional breadth and human proximity, is perhaps the most important field of application - bring benefits where it serves legitimate purposes as a responsibly used means. Admittedly, these purposes may be in conflict with each other, and medical ethics will not be made

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## One of the essential challenges is to transform medicine in such a way that it can take advantage of the opportunities offered by digitisation without losing sight of the core of its own noble purpose

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ment path that is less gradual than structural, one that makes the position of man in the cosmos as a whole questionable once again but more fundamentally and recommends it for reconceptualisation. After the Copernican turn, now it's AI's turn? And yet one thing is true of the discussions surrounding Harvey's old discoveries and the new digital developments: neither of them are self-propelling in the scientific community and certainly not in clinical and further care - even if today the eHealth community is certainly much broader and economically more agitated and moving. However, if it remains true that medicine as a subject between science, art and ethics secures its dignity through the primacy of ethics, this means that smart medicine, like all other technological innovations, must serve humanity. For this to happen, however, ethical discourses and insights and corresponding consequences for action are necessary, as well as clear information for system professionals and patients alike. Otherwise, even the most intelligent technology assessment will come to nothing.

### Digitisation is Not an End in Itself

In this sense, the criticism of eHealth & Co. - one could subsequently speak as the older criticism of Harvey of "Smart Circulator" for the actors - can only be substantiated if ethical arguments put effect in the sense of healing and risks as well as further possible value violations into a proper relation. Where this does not happen, one must speak of a vapid, unpleasantly abstract moralism that itself forgoes its own ethical evaluation, and thus reduces opportunities for patients.

easier by digitisation, only richer in challenges. As long as humanity, closeness, warmth and care, healing and helping form the infungible primordial ground of medicine, digital innovations can only be dispensed with by arguments that are often not easy to win. How we, as finite beings on the threshold of the real digital age of autonomous systems, deal with our finiteness, whether we seek to overcome it or find ourselves in it, these questions are basic anthropological concerns which are themselves ethically oriented. Is therefore "finiteness" a "disease", "death" a "mistake" and "disease" itself mere not-yet-knowledge?

Smart cardiology is not charlatanry; it is an important step towards a better, error-reduced, safer medicine; a medicine that draws its social license to heal from a critical-open assessment of digital technologies and their medical use.

One of the essential challenges of jointly shaping a successful, healthy, equitable and sustainable future for all people is to transform medicine in particular in such a way that it can take advantage of the opportunities offered by digitisation without losing sight of the core of its own noble purpose. At the end of the day, at the very least, it will also depend on whether we domesticate the machine revolution, which is about to replace our thinking itself. If the first added values that can be generated legitimately, legally and efficiently for patients are already being talked down and hastily described as a risk, later developments that are socially hardly reversible will probably take the place of precisely these small but useful and also justifiable smart developments in medicine. In a certain sense, advocating a

smart new medicine today also helps strategically to ensure that market participants who do not attach any great importance to legitimate practices, but for whom the exploitation of legality is quite sufficient, do not gain a competitive advantage with strongly marketed offers of benefits that hardly seem to be catchable on free markets. Framework conditions that focus on central values such as dignity

assume responsibility. The machines have to follow the measure of ethics, not the moral actor “man” the measure of the machines. If this central point is not lost sight of, developments such as those in cardiology can save and improve lives and ultimately make an important contribution to a world in which we are all allowed to be healthy and still human at the same time.

## Replacing the moral actor “physician” is ethically impermissible since machines cannot (and probably should not) assume responsibility

and autonomy, without necessarily making innovations in medicine impossible, will form the basis in concert with good institutional activities so that those who are actually at stake, the patients (and the professionals around the system, who have a right to good work and respect), can derive at least as much benefit from these offers at a comparable price.

Ethics as a competitive advantage remains empty without concrete evidence that this idea carries in reality. Competitive advantages with at least a lesser degree of ethics remain blind, no matter how successful they may be. Therefore, the empowerment of the consumer, the customer, also has a central role to play, even if we may feel uneasy about calling the patient a customer. Because it may be today also in solidary health care systems at the end exactly so - not always and with it nothing is suspended over the employment and the quality of humans those in the system responsibility take over. But about the system itself. It would therefore be better to position oneself in such a way that the patients, who probably first have to be customers in order to be allowed to be human beings, also get this chance as enlightened good customers. And work together with doctors and nurses in a spirit of partnership - the doctor-patient-machine triangle is certainly not an entirely wrong description in this respect, but it is important that the actual priority of the doctor-patient relationship is not lost sight of in this picture, no matter how intelligent aids may be available to further shape it.

Cardiology is a discipline with many opportunities and a corresponding responsibility to contribute to a modern, digital, effective and ethical medicine. If it is reported in 2019 that artificial intelligence may detect myocardial infarctions in the ECG more reliably than cardiologists, this will be useful if it becomes clear that medicine will become better as a result and at the same time cardiologists will be prepared for this development and remain in the driver seat. Replacing the moral actor “physician” is ethically impermissible since machines cannot (and probably should not)

### Conflict of Interest

The author states that no conflict of interest exists. For this article the author has not used any studies on humans or animals. ■

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