Meet Key Digital Health thought Leaders: Hugo Saner

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CardioPulse Digital talks to a pioneer and early adopter of eHealth in cardiology: Prof. Dr. med. Hugo Saner.

Prof. Dr. med. Hugo Saner is active as senior researcher at the ARTORG Center for Biomedical Engineering Research and at the Institute for Social and Preventive Medicine at the University of Bern, Switzerland.

Some information about yourself, your current position and experience

I am currently active as senior researcher at the ARTORG Center for Biomedical Engineering Research and at the Institute for Social and Preventive Medicine at the University of Bern, Switzerland.

At the ARTORG Center, we are doing research with ambient motion sensors combined with a bed sensor to track sleep, heart rate and respiration in the homes of elderly people with the aim to recognize typical patterns of behaviour and indicators for health and disease in a non-intrusive way. Our research is based on a long experience with cardiovascular prevention and rehabilitation, where physical activity and exercise are a cornerstone. It is fascinating how much information regarding physical and psychological health can be acquired through analysis of motion patterns. We have been able to show a good correlation of sensor signal patterns with strength, physical performance measures, and cognition. We further achieved to define digital biomarkers for serious health problems such as sleep disorders, heart failure, rhythm disturbances, Parkinson disease and health deterioration in a COVID-19 patient. The ultimate goal is to create an individual behaviour based on digital biomarkers, which helps to detect signs of health deterioration early and allows to start preventive interventions before a serious health problem occurs.

At the Institute for Social and Preventive Medicine, the main focus of my research is stress as a cardiovascular risk factor. I strongly believe that stress is the single most important risk factor, not only because of its direct negative impact on virtually all systems of the body but also because stress is an overriding risk factor with a negative impact on most if not all other lifestyle risk factors.

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Pubmed shows you were already active with Digital Health in the early 1980s by using computers in electrocardiography. What attracted you to use computer technology in your clinical work?

It has been during the time of my fellowship in Minneapolis/USA that I came in contact with the first ECG computer with automated analysis of the ECG tracings based on artificial intelligence. This new technology fascinated me because analysing routine ECGs from many patients, mostly in the evening hours after the clinical work, was a burden with a risk of mistakes because of attention deficits. Furthermore, normal ECG tracings are relatively well defined and deviations from a normal tracing can easily be recognised by automated analysis. In a prospective study comparing results from automated ECG analyses with the interpretations by experienced specialists in internal medicine and cardiology during daily clinical routine, results confirmed that automated analysis and interpretation of ECG tracings was superior in regard to anomaly detection compared to an interpretation by experts. This finding triggered my interest in automated analysis and interpretation of medical data in daily practice.

You have been a pioneer in putting Digital Health on the map by organising a special conference entitled eCardiology and eHealth. That was an immense challenge. What inspired you to do this?

It was in 2013, when I realised that we urgently need a new platform for the exchange of ideas between the different stakeholders and in particular between health professionals and developers. The format of an European Congress on eCardiology and eHealth with approximately 800 participants from around the world, turned out to be an ideal format for this purpose. Besides the standard oral and poster formats, our congress wanted to be different. We were seeking for active discussions between professionals from clinical practice and industry and for showcases demonstrating the developed solutions live on stage.

Do you see disruptive Digital Health Innovations on the horizon?

It is evident that it remains an enormous challenge to lower cost and, at the same time, to maintain quality in health care. The areas where I see the biggest chance for Digital Health Innovations to become disruptive include 1) the substitution of hospital care by home care supported by various sensors, self-monitoring of vital parameters and point-of-care diagnostics; 2) the monitoring of elderly people by ambient and wearable sensors in their homes to allow them to live an independent life as long as possible; 3) the use of telemedicine for the provision of health care at a distance; and 4) the use of telerehabilitation to allow a larger number of patients to profit from rehabilitation and secondary prevention interventions.

Is there anything else you would like to share as a Digital Health Ambassador?

We know that up to 90% of health care costs are spent on institutionalized medical care, whereas 85-90% of the population are more or less healthy and not in need of such expensive care. Health is mainly determined by a healthy lifestyle (estimated contribution 50%), environment (20%), genetics (20%) and only around 10% by medical care. Therefore, we need a shift of the major focus of Digital Health innovations from developing specialized and very expensive technologies - which are of help for a minority of patients - to digital technologies which are inexpensive, easy to use, widely applicable and allow to facilitate preventive measures and interventions in a larger proportion of the populations around the world. The use of smartphones as a personal health hub carries a great potential to facilitate such developments.