DigitalWorld 2023 & NexComm 2023

Challenges of Digital Health

General concerns

Digital (de)Concentration and Digital Risks for Mental illnesses

Remedy via Social Networks

Mental and Behavioral issues Prevention

Counseling and Cognitive Rewards

Overcoming Digital Anxieties by Dealing with the Trivial and Meaningless

Focusing on AI

- patient data for AI development. Issues of privacy and security.

- potential use of Chat-GPT in medicine and healthcare

- discuss if AI may replace any position/occupation in medicine and healthcare

Moderator

Prof. Dr. Monika K. Gullslett, Norwegian Centre for E-healthResearch, Norway

Panelists

Prof. Dr. Vitaly Herasevich, M.D., Ph.D, Mayo Clinic, USA

Dipl.-Ing. Dr. techn. Gerold Hoelzl, University of Passau, Germany

Assoc. Prof. Dr. Niels Frederik Garmann-Johnsen, University of Agder, Norway

Prof. Dr. Olga Levina, Technische Hochschule Brandenburg, Germany

Digitalization means new ways to deliver services and acting in new roles

Common goals:

- Better health services – increase quality and access to services with digital solutions
- Work interdisciplinary - break down silos - cocreation
- Person-centred perspective and inclusion – user involvement
- Digital health literacy - training and motivation among health personnel and citizens
- Sustainability in societies promote health in a resilient perspective (system vs individual responsibility)
- Digital equity in global perspective

User experience with digital solutions in mental health (WHO)
https://ehealthresearch.no/videoer/young-people-and-mental-health

How to use digital solutions in the meeting with adolescents?

Monika Knudsen Gullslett
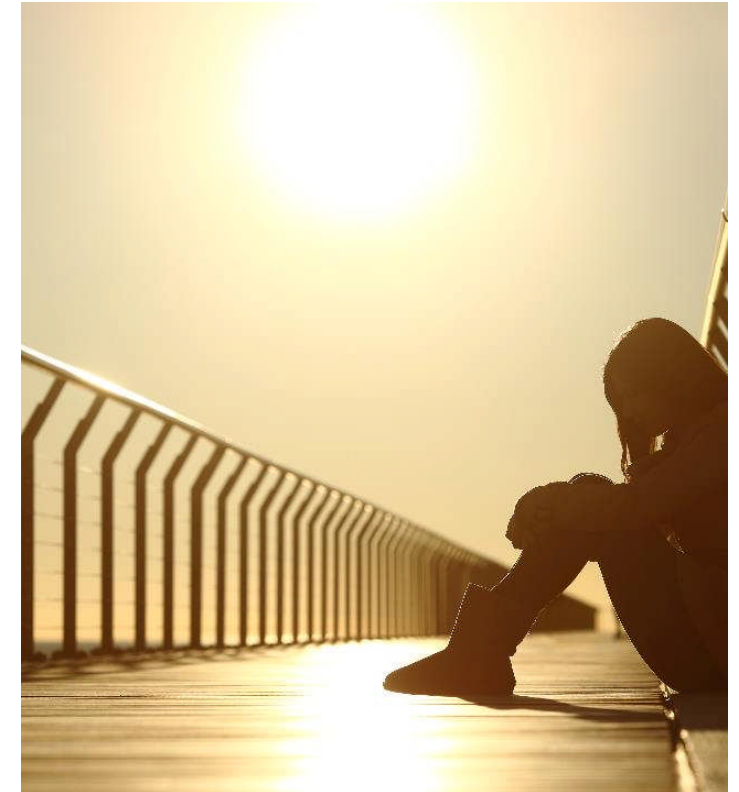https://ehealthresearch.no/en/monika-knudsen-gullslett

Video consultations in mental health for youths

VC can bring new opportunities such as
- Reduced travel time
- Reduced travel costs
- Reduce hours absent from school

Challenges
- Disturbances at home/school
- Affects the naturalness of the relationship with the therapist
- Difficult to see each others body language
- Adolescents have individual preferences
- A combination of VC and face to face was preferable
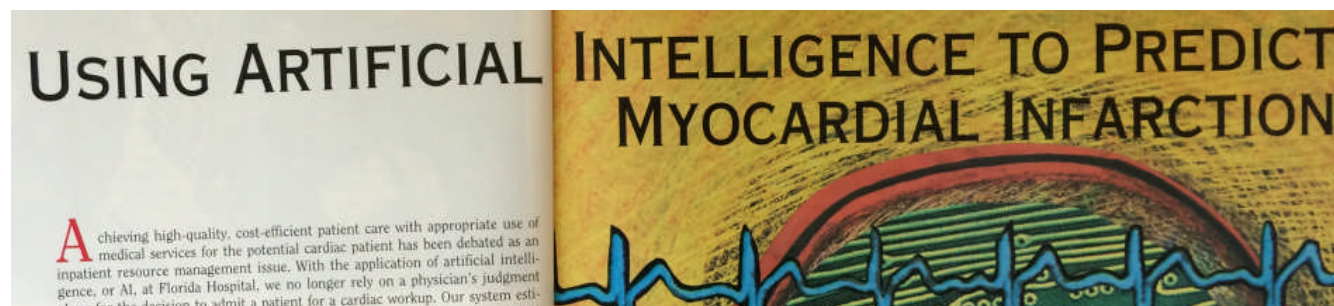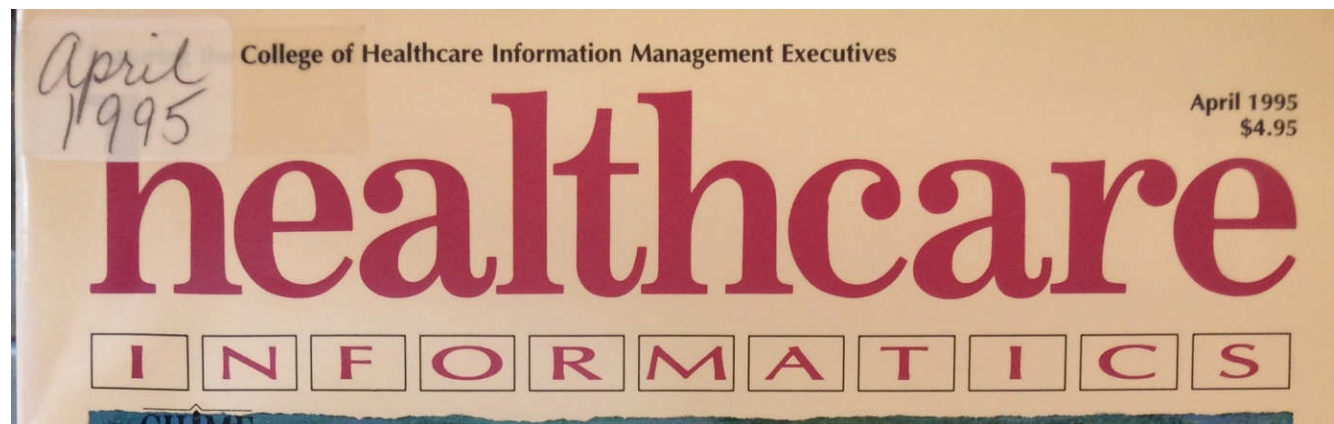- VC can be a flexible tool, and can be used for short conversations or for information sharing

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• Why there are not much progress in Healthcare AI?

Vitaly Herasevich

1995

College of Healthcare Information Management Executives

April 1995
$4.95

healthcare

I N F O R M A T I C S

USING ARTIFICIAL INTELLIGENCE TO PREDICT MYOCARDIAL INFARCTION

Achieving high-quality, cost-efficient patient care with appropriate use of medical services for the potential cardiac patient has been debated as an inpatient resource management issue. With the application of artificial intelligence, or AI, at Florida Hospital, we no longer rely on a physician's judgment alone for the decision to admit a patient for a cardiac workup. Our system esti-

Problem: EMR data has pre-test probability

- EMR data has characteristics that decrease the practicality of most predictive models.

- It is Pretest Probability which is the probability of a patient having a target disorder before a diagnostic test result is known.

- Data is present in the EMR when clinicians cause it to be there as they suspect a specific health problem. For example, a diagnostic troponin test is ordered because a physician suspects myocardial infarction.

Replace or Assist - Therapist in a Tech Saturated World

Till today challenging to capture **Mixed Method data** outside of a **Controlled Therapy Session**
- Physiological measures recording (EEG, HRV, GSR, …) based on a wearable
- Accurate enough compared to clinically approved hard- and software

Episodes in e.g., **Depression** or **Bipolar Disorder** need long term recordings
- Mania, Hypomania, Depression, Mixed Episodes
- Episodes have **Unique Set of Symptoms**
- but can happen either **frequent** or **only a few times** over **lifetime**
- **Correlated** and/or **Redundant Information not recorded** but **Effecting the User**

AI based Systems to capture **Impacts of Symptoms** on the Person
- Highly Individual and Changing, constantly model updates needed
- Identification of **Early Virtual Behaviours Markers (physiological-psychological change markers and indicators)** as a combination based on **Physical** and **Virtual Sources of Information**
- Identify **Changes** and **Anomalies** in Captured Data
- Usable as **Early Predictive Indicators** e.g., in mHealth/Digital Health

Direct Intervention can be **Critical**
- How to avoid a **Negative Impact** on the **User**
- **Notification** of **Therapists** as **Intervention Paradigm**

Gerold Hoelzl

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Panelist Position

What is AI?

Old concept, dates from 1950s, (earlier in Sci-Fi); how does machines think? Do they think? A modern understanding is that AI is the hybrid emulation of algorithms, data and humans (Rahwan et al, 2019). So the answer is yes, and we need to consider and learn more about the agency of machines, and understand how they behave and evolve (Op. cit.).

AI in healthcare?

Do we have a choice? If we want to maintain the level of welfare we have, in future, with an aging population in most western countries, the answer is probably no. Technology is needed to supplement and enhance human capacity.

ChatGPT and similar solutions

As researchers and teachers (most of use has a double role) we should promote learning more about, not only concerns, but also the possibilities of AI and conversational bots, in promoting learning and improvements in all processes, including those in healthcare.

- Shift in use case:
  - Wearble devices have changed from a technological add-on to monitor steps, personal bests and fitness tracker to management tool for chronical conditions and detector of symptoms of chronical diseases.
- Shift in technology: Better sensors; cheaper devices; accessible devices; better data coverage
- Shift in the ecosystem: FDA approved digital devices and wearables
- Shift in responsibility?: After Dr. Google- Dr. Me?
- Shift in skillsets: both for users/wearers and health care providers
- Shift in ecosystem *required*:
  - Clearly define the problem (health risk/ status/phase)
  - Integrate into a system of healthcare delivery, technology support (health provider and user), personalized experience,
  - Focus on end-user experience (health provider and user),
  - Provide technical infrastructure (data transport; privacy, security, transparency)
  - Align with reimbursement models (health provider and user).
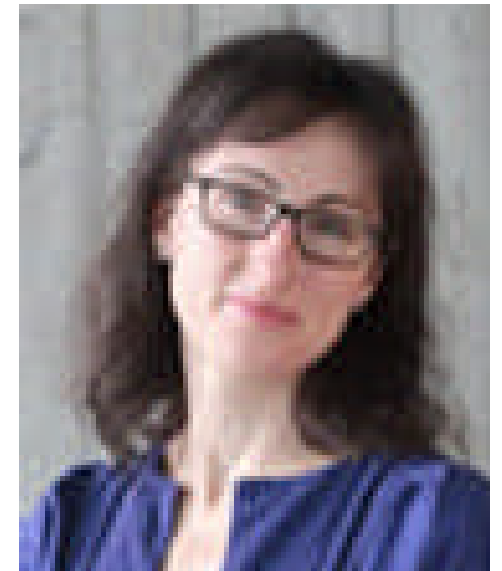
Output highlights

- AI might assist for pharmaceutics research and quicker feedback/assist to doctors
- Deep-learning increases the accuracy of some medical procedures
- AI and all digital procedures help for global health equity.
- AI assists in prevention and early detection of health issues
- AI determines a shift in skillsets
- Digital procedures (telemedicine, in-house assistance, devices for self-care empowered patients) are helpful for particular health issues
- AI-enabled medical devices provide extra support to hospital personnel (assist, document).