

# Real time monitoring of patients in Radiation Oncology

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In Next 20  
minutes...

- Remote monitoring
  - What
  - Why
  - Scope
  - Barriers
  - Vision

REMOTE  
MONITORING  
OF PATIENTS-  
WHAT IS IT?

Continuous tracking of patient health data and symptoms outside of clinical settings, using digital tools and technologies.

Real-time tracking of patient symptoms and side effects.

Early intervention and timely treatment adjustments.

Improves patient outcomes and reduces hospital visits

# Why should we remotely monitor patients in cancer?



Screening

Monitoring

Nutrition

Mental health

Pain

Side effects of CA and Rx

Improving communication at the individual level

Aid in decision-making

Assess aggregate quality over time

**Empowers patient to be active participant in managing their health.**

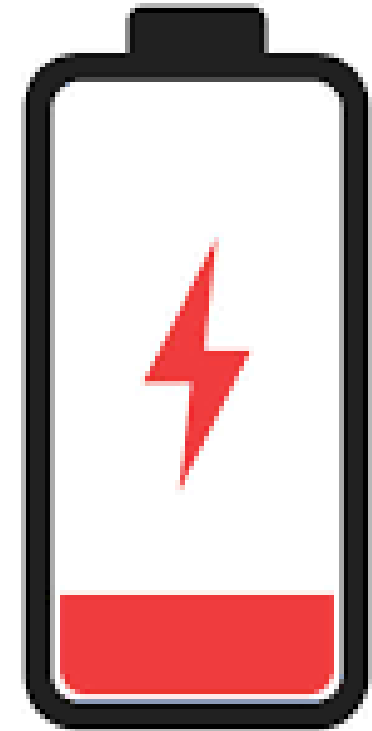
# Cancer and its repercussions

- Cancer care - Tedious multidisciplinary long-drawn-out effort
- Fatigue is real!

Patient  
Fatigue

Physician  
Fatigue

Caregiver  
Fatigue





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We save lives

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Simultaneously create a set  
of discontented survivors!

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The more we succeed ...  
more this problem increases!

THE PROBLEM  
WITH  
RADIATION  
ONCOLOGY

Let me tell you  
3 stories...

I have saved your life,  
now shut up and live  
your life

IPSS score...

Lack of data  
points for AI  
research

# How do we address this?



Making patients partner in data collection



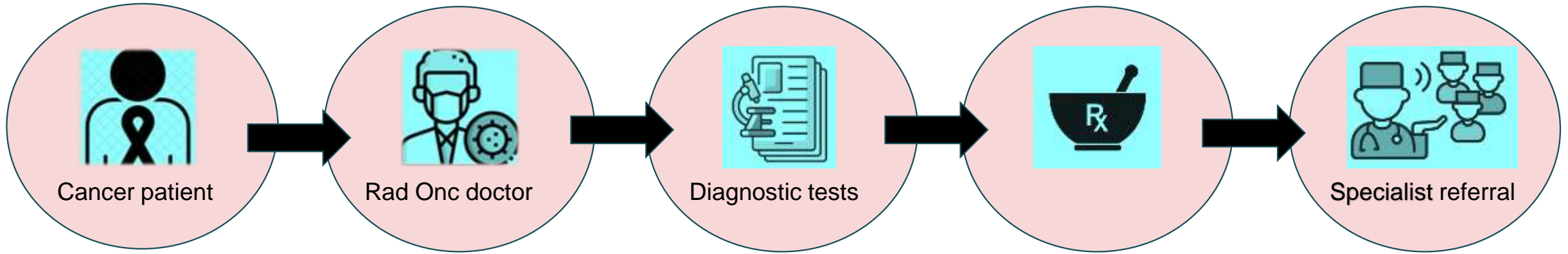
Empowering them



Changing conventional norms of “Patient reported outcome measures” (PROM) to Realtime reported PROMs



# Problems with conventional oncology monitoring



Lack of adherence to care



HIGH COST



LONG WAITING  
TIMES



TRAVEL AND  
LOGISTICS ISSUE



DELAY IN  
APPOINTMENTS  
WITH  
SPECIALISTS



NAVIGATION  
THROUGH THE  
SYSTEM  
CHALLENGING

# Solution: Telemedicine



For me: Able to monitor the survival and hope patient is recovering/coping

For Patient: Relief and reassurance that doctor cares

## **Pros:**

Financial burden lessened (travel, itinerary, saved work-days of caregiver etc.)

## **Cons:**

Appointment every 3-6 months

Longer duration wears down the participants.

Scope not clearly defined

Need for **adjunct monitoring** still persists

# PROMS MEASURING HEALTH OUTCOMES

## Conventional PROMs

1. Long Questionnaire – leading to fatigue
2. Recall bias
3. Redundancy of information capture

## Clinical Implementation barriers

1. Mainly research mode
2. Cultural variations not addressed
3. Language barriers

<https://apersu.ca/what-are-proms/>

Adjunct  
monitoring ...  
via PROMs-  
Patient-reported  
outcome measures

# Solution: Real-time (electronic) PROMs

## Real Time Data Collection.

- Activity levels
- Sleep
- Heart rate

## Continuous Monitoring

## Predict and alert

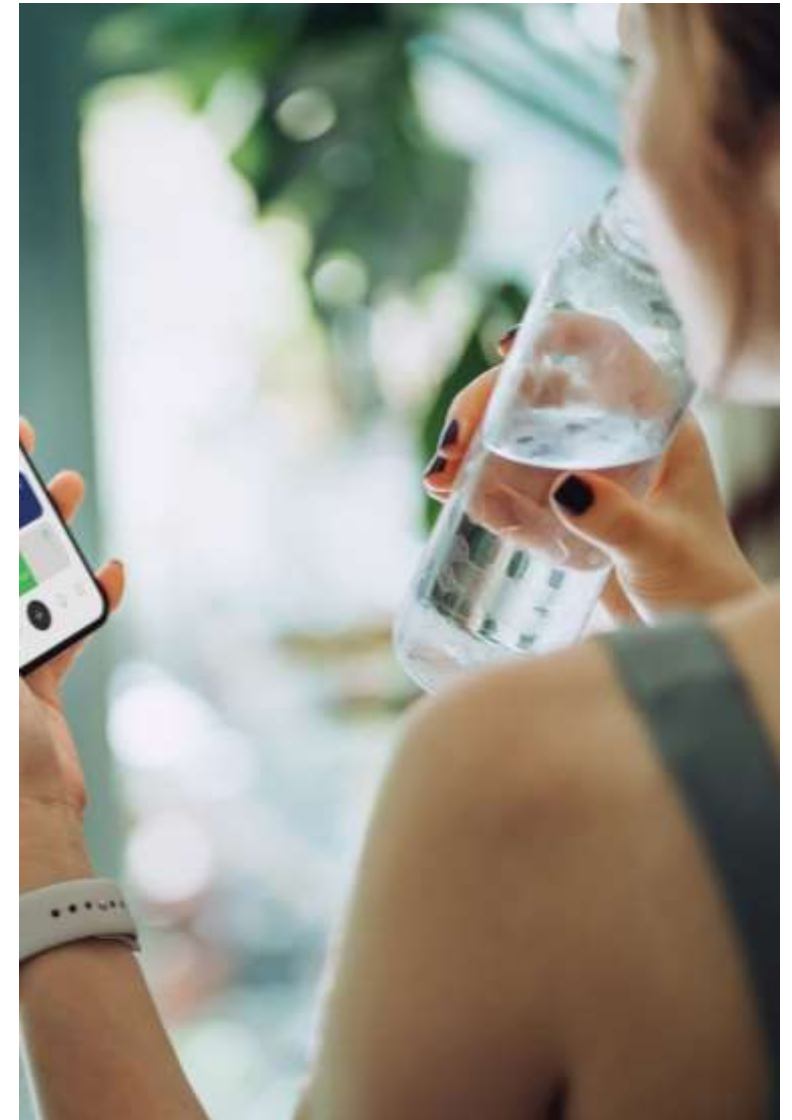
## Empower patients

## Why not the larger domain of quality of Life ?



# Real - time monitoring apps - examples

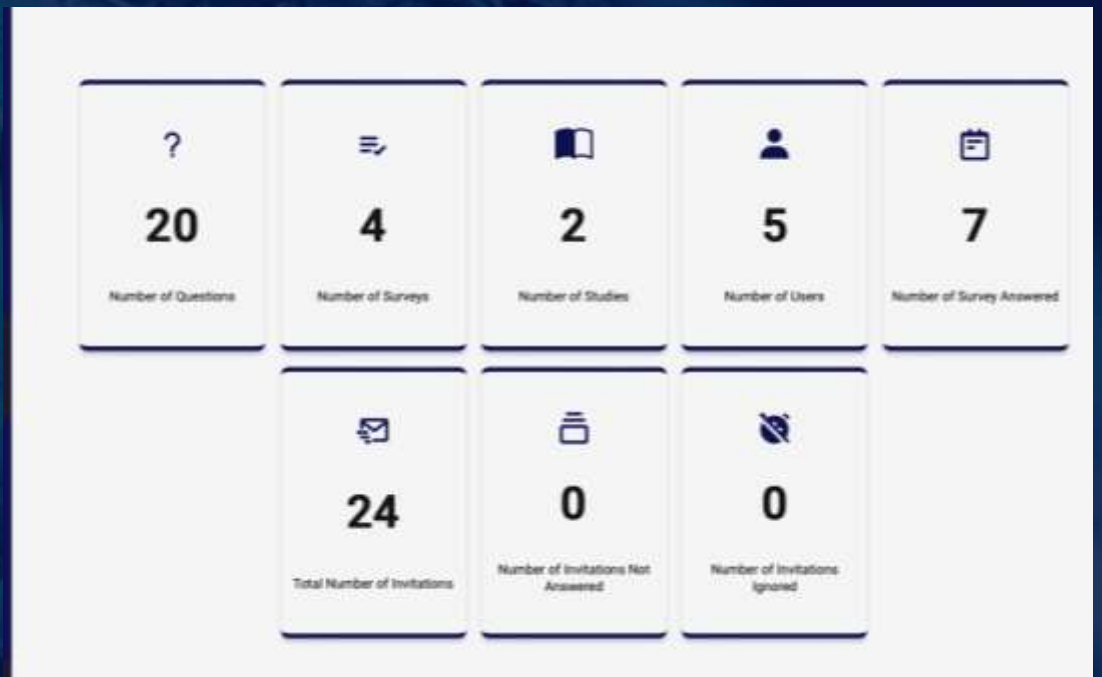
- **Nuna**, mental health companion
- **VARIAN Noona**: Oncology centric patient support
- NHS England Digital - **PROMS**
- **Ada AI Doctor** , personal health companion and telemedicine app
- **Sensely**, a virtual reality nursing assistant . Checks patient, records vitals , funnels them back to physicians.
- **SkinVision**, helps in self-examination of skin condition and informs them when to act.



- ☰ Surveys ▾
- ? Questions ▾
- 👤 Users ▾
- 📄 Reports ▾
- 🕒 History
- ⚙️ Profile

### About e-PROM

Patient-Reported Outcome Measures (PROMs) assess the disease symptoms, overall health, and Quality of Life (QoL) from the patient perspective. In our era of wearable and remote monitoring of physical health, I-DAIR envisions assessment methods that would be directly integrated into patient-owned connected devices, with the goal to ease monitoring and avoid interference, such as questionnaire fatigue, recall bias, improper outcome analyses, cultural variations or language barriers.



# Our in-house development – Universal ePROM platform Since 2020

# Addressing Language Barriers

- Simplifying medical jargon
- Delivering PROMs in Indian languages
- Informed consent rather than forced assent

## Solution

- Natural language processing – Simplify medical text to layman's terms
- Translate to Indian languages (via Bhashini)
- **Pilot in consent forms**
- Benchmark in one disease site – HNC
- Expand

Collaboration: IIIT- Hyderabad



## IIIT-H incubated startup turns boon, translates clinical trial consent forms

Nirupa Vatyam / TNN / Updated: Jun 6, 2024, 13:32 IST

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### New For You



'Our war is your war, our victory will be your victory'; Benjamin...



'How far was Oswald...?' FBI reveals Trump shooter's shocking Google...



'Is lifting of a 44-year-old ban BJP's offer of peace to RSS?



HYDERABAD: A city-based startup has successfully translated patient consent forms and information sheets from English into Telugu, Bangla, Malayalam, Tamil and Hindi to help clinical trial participants make an informed decision.

The solution developed by eBasha Setu, which is incubated at the IIIT-H, is being used by one of the city's major corporate hospitals and a private hospital in Vellore.

What do you see as the biggest challenge in ePROM deployment and remote monitoring?



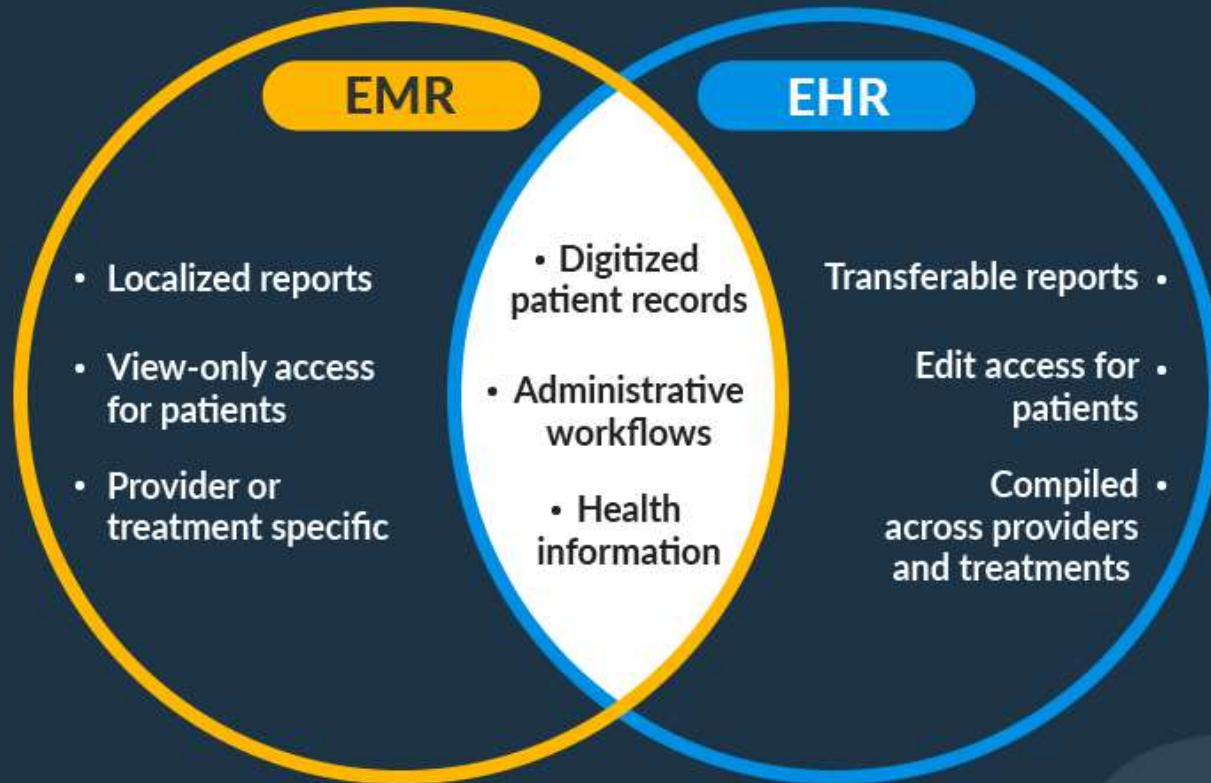
## What we need

- Integration and Interoperability
- Not creating another SILO of data that no one looks at

Integration of data ...  
needs an  
infrastructural  
**backbone**



# EMR vs. EHR



SelectHub

## Adoption barriers

Not all hospitals have electronic medical records

Existing EMRs are data-loaded

## Solutions

Keeping data capture simple

Easy to integrate into existing workflows

CDAC

# Envisioned Future

Patient generated information get integrated into a common dashboard

- Simple
- Interoperable
- Private and Secure
- Connects to HIS

We are not far from it !!



Remote monitoring

Integrated interoperable  
digital EMR

Where does  
this take us ?

Empower the patient

Shared decision making

Traditional **uni-directional** research-centered view



New **bi-directional** patient-centered view



- Involve patients more actively in their treatment decisions
- Utilize data from remote monitoring and EMRs to inform decisions
- Improve patient satisfaction and treatment adherence

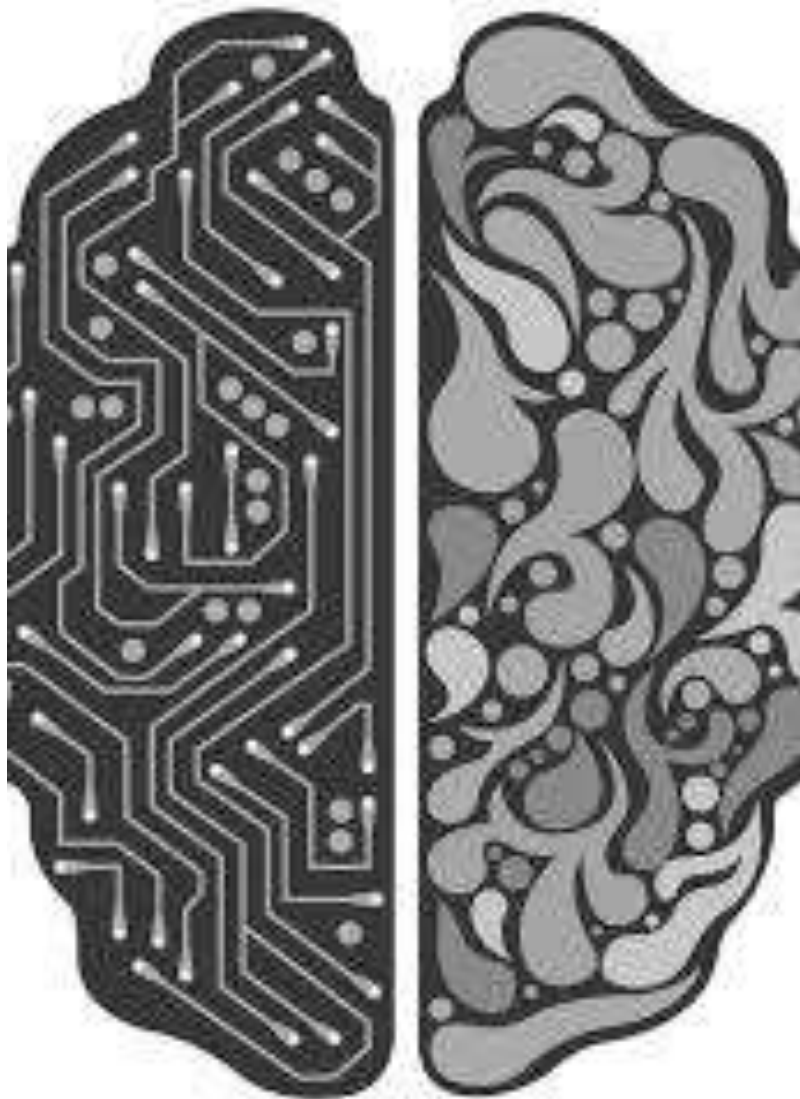
Better  
continuum of  
care – via  
remote  
monitoring



# Virtual Care

A concept we need to embrace...





# Digital biomarkers and EHR

Objective, quantifiable physiological and behavioral data collected through digital devices

Can be used to explain, influence, or predict health-related outcomes.

\* Can include data from wearables, smartphones, and other digital devices

\* Used to track treatment response, predict outcomes, and detect early signs of complications

\* Enhances personalized treatment planning in radiation oncology

1999 – 2024

Have we made  
patient  
accessibility  
better?





**Thank YOU !**  
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**Photo courtesy:** Dr Vidya Konduru