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APRE
Agenzia per la Promozione della Ricerca Europea


# Digital Health and oncology in Europe: the contribution of the Joint Actions eCAN and eCAN+

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# Outline

eHealth: definition

New technologies utilization in cancer care

Telemedicine in cancer care: risk and opportunity

eCAN  EU JA- final data

E CAN plus next JA

PubMed®

telemedicine AND e-health

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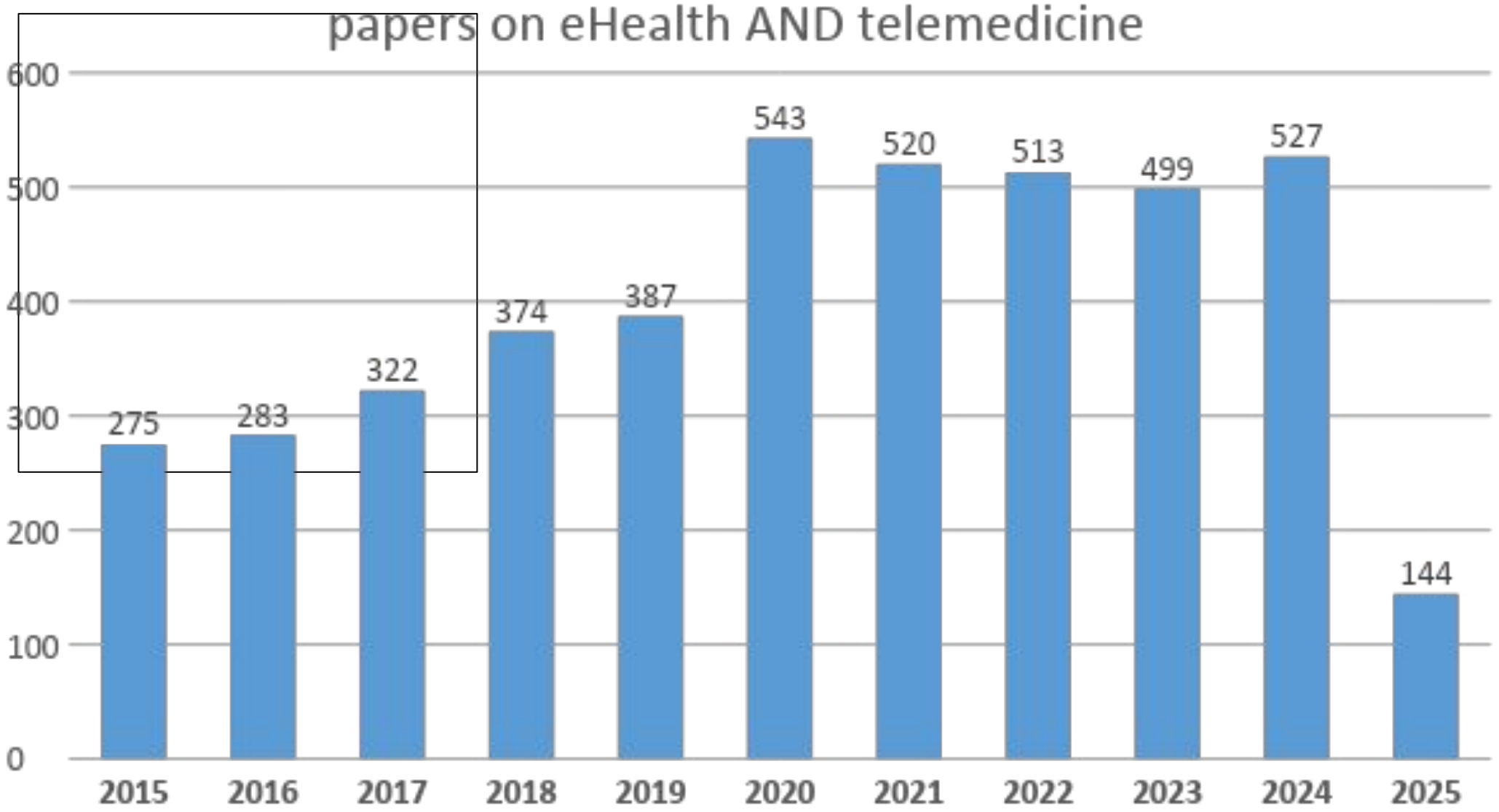


Digital health may be categorized as

- Mobile health (mHealth)
- Health information technology
- Wearable devices
- Telehealth
- Telemedicine
- Telemonitoring

# Dictionary

**E Health**:healthcare services provided electronically via the internet.

**mHealth (mobile Health)**:  medical and public health practices supported by mobile devices such as smartphones, patient monitoring devices

**Telemedicine:** The delivery of health care from a distance using electronic information and technology, such as computers, cameras, videoconferencing

**Teleconsultation:** A healthcare consultation carried out remotely using audiovisual telecommunications between doctor and patient.

**Machine learning**: the use and development of computer systems that are able to learn by using algorithms and statistical models

**Deep learning:** a subset of **machine learning** that uses multilayered neural networks, to simulate the complex decision-making power of the human brain

**Artificial intelligence** (AI) refers to the capability of computational systems to perform tasks typically associated with human intelligence

# Telemedicine in cancer care

The patient-reported outcome (PRO) is a standardized method for measuring patients' views of their health and health-related quality of life, and the results are expected to play several roles in advancing patient-centered health care.

**Cancer type**

Breast
Colorectal
Lung
Haematological
Head & Neck
Gynecological

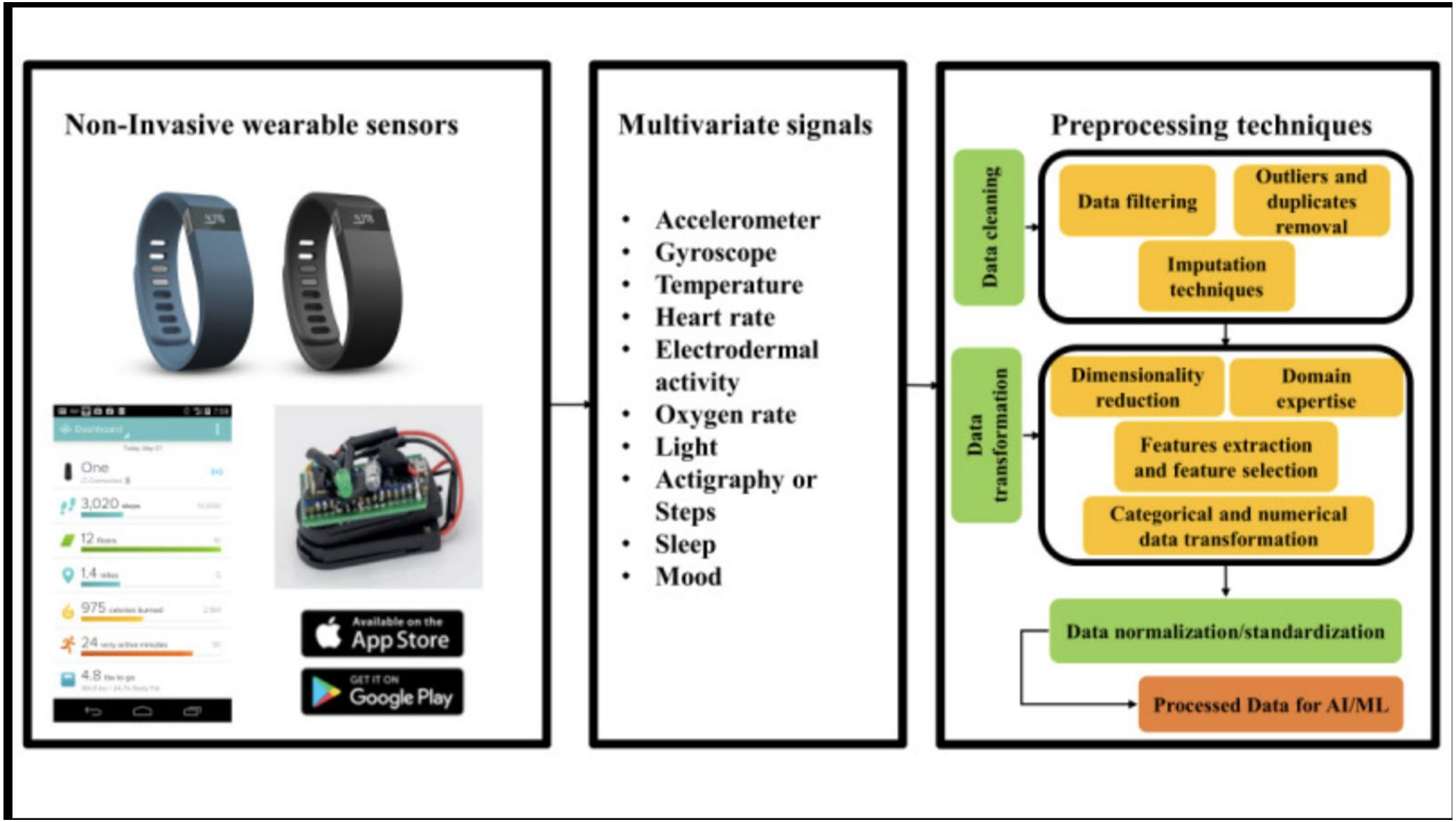
**tools**

App
Wearables
Console-Device
Web Platform

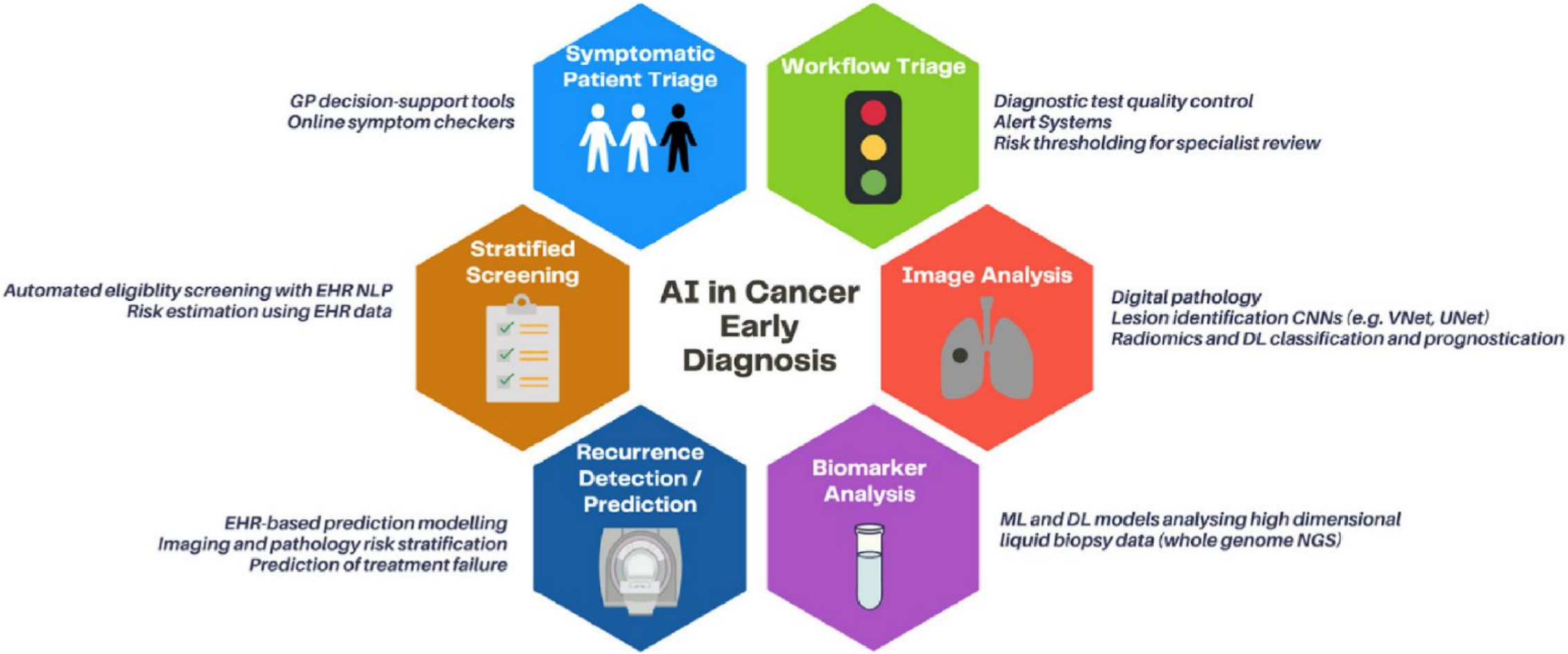
**Setting of care**

Early stage
Post surgery
Treatments
End of Life
Palliative care

# Telemonitoring with wearables



# Advancing the frontier of artificial intelligence on emerging technologies to redefine cancer diagnosis and care




Computers in Biology and Medicine 191 (2025) 110178

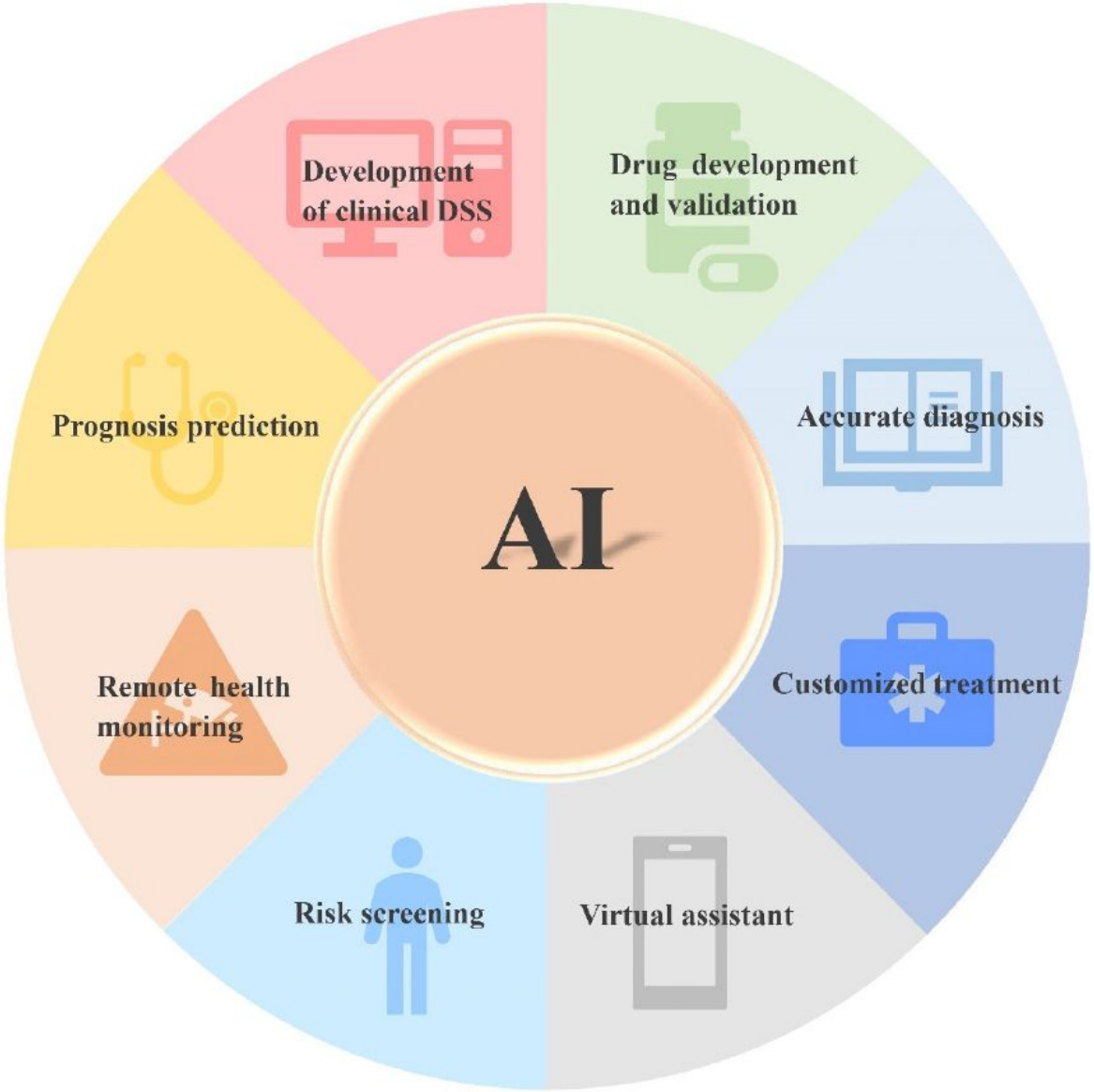



FIGURE 2
Application prospect of AI in tumor.

# Telemedicine and cancer care:

eCAN Strengthening eHealth for Cancer Prevention & Care

EUROPEAN COMMISSION
EUROPEAN HEALTH AND DIGITAL EXECUTIVE AGENCY
EU4Health Unit

Europe's Beating Cancer Plan

EU4H-2021-JA-05: *Direct grants to Member States' authorities:* ***strengthening eHealth, integrating telemedicine and remote monitoring in health and care systems for cancer prevention and care*** *(AWP Ref.: DP/C-g-11.3.1)* – Budget: 4 000 000 EUR.

*Cancer care is currently shifting from a disease-centered approach to a more personalized and person-centered approach.*

*The integration of telemedicine tools such as teleconsultation and telemonitoring may allow to improve person-centered care and patients' empowerment.*

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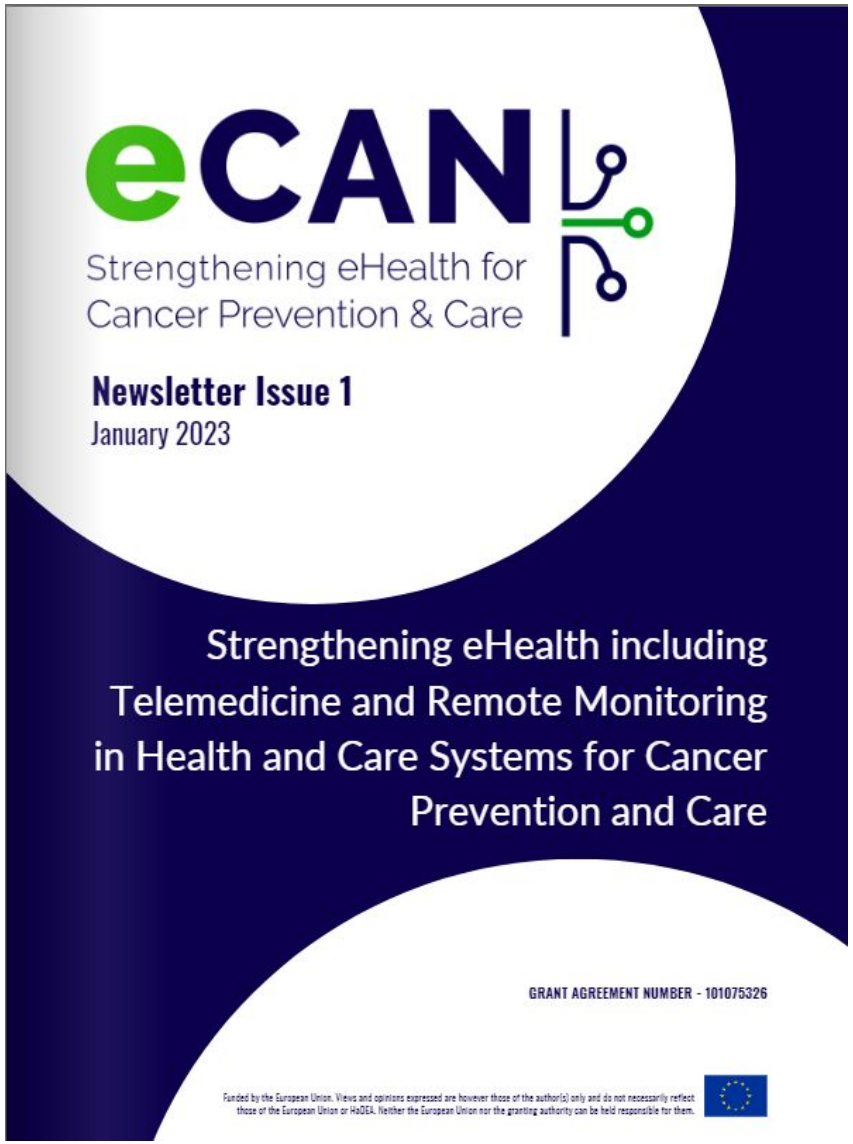




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teleconsultation and telemonitoring in two clinical trials focusing on tele-rehabilitation and tele-psychological support in different populations of cancer patients in 11 European countries. **Patient Reported Outcomes (PRO)** and Experiences will be monitored by dedicated tele monitoring systems

**eCAN1 experience**

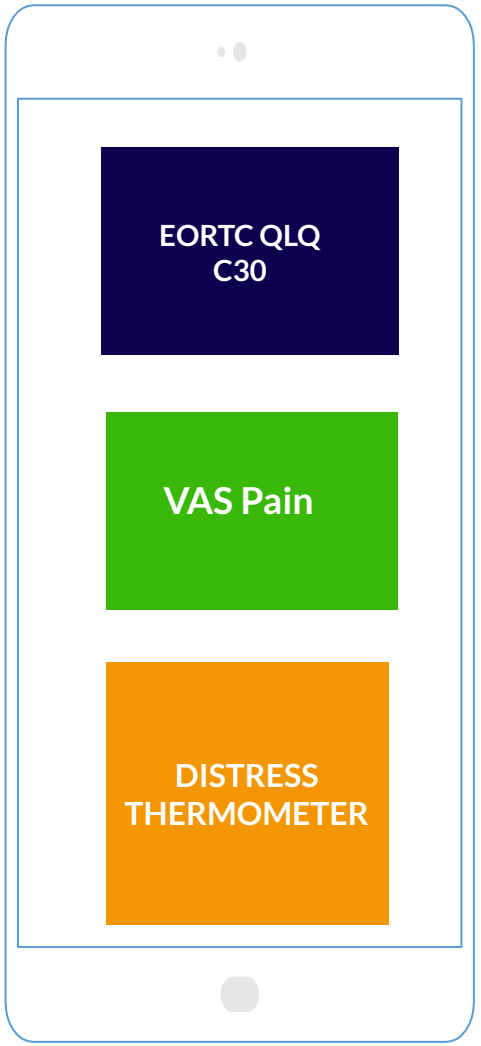
**Pilot studies**

**10 EU countries and 18 clinical centers involved in eCAN**

**Pilot 1 a: tele-rehabilitation and telemonitoring in Breast Cancer patients after surgery**

**Pilot 1b: tele-rehabilitation and telemonitoring in H&N cancer patients**

**Pilot 2: tele-psychological support in patients with advanced cancer at recurrence**




A total of **260** patients were randomized in 16 EU cancer centers

# The main objectives of the pilots:

- To assess the impact of teleconsultation program and telemonitoring focused on rehabilitation after surgery for patients with BC (1a) and H&N (1b) cancer on the PROMs (HRQoL and pain) compared to usual care.

- To assess the impact of teleconsultation program and telemonitoring focused on psychological support for patients with advanced cancer on the PROMs (HRQoL and distress) compared to usual care.

## End points

1. The primary end point was the change of HRQoL measured with EORTC QLQ C30.

2. The secondary end points will be the change of pain measured with a Pain VAS (Pilot 1) or distress measured with Distress Thermometer (Pilot 2)

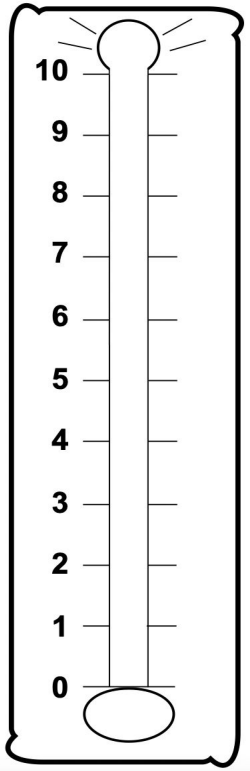
# DISTRESS THERMOMETER

**NCCN DISTRESS THERMOMETER**

**Distress is an unpleasant experience of a mental, physical, social, or spiritual nature. It can affect the way you think, feel, or act. Distress may make it harder to cope with having cancer, its symptoms, or its treatment.**

**Instructions: Please circle the number (0–10) that best describes how much distress you have been experiencing in the past week, including today.**

**Extreme distress**




**No distress**

# VAS Pain scale

# EORTC HRQoL C30

**Table 1: Scoring the QLQ-C30 version 3.0**

| | Scale | Number of items | Item range* | Version 3.0 Item numbers | Function scales |
|---|---|---|---|---|---|
| **Global health status / QoL** | | | | | |
| Global health status/QoL (revised)† | QL2 | 2 | 6 | 29, 30 | |
| **Functional scales** | | | | | |
| Physical functioning (revised)† | PF2 | 5 | 3 | 1 to 5 | F |
| Role functioning (revised)† | RF2 | 2 | 3 | 6, 7 | F |
| Emotional functioning | EF | 4 | 3 | 21 to 24 | F |
| Cognitive functioning | CF | 2 | 3 | 20, 25 | F |
| Social functioning | SF | 2 | 3 | 26, 27 | F |
| **Symptom scales / items** | | | | | |
| Fatigue | FA | 3 | 3 | 10, 12, 18 | |
| Nausea and vomiting | NV | 2 | 3 | 14, 15 | |
| Pain | PA | 2 | 3 | 9, 19 | |
| Dyspnoea | DY | 1 | 3 | 8 | |
| Insomnia | SL | 1 | 3 | 11 | |
| Appetite loss | AP | 1 | 3 | 13 | |
| Constipation | CO | 1 | 3 | 16 | |
| Diarrhoea | DI | 1 | 3 | 17 | |
| Financial difficulties | FI | 1 | 3 | 28 | |

* *Item range* is the difference between the possible maximum and the minimum response to individual items; most items take values from 1 to 4, giving *range* = 3.
† (revised) scales are those that have been changed since version 1.0, and their short names are indicated in this manual by a suffix "2" – for example, PF2.

Name: _____ Date: _____

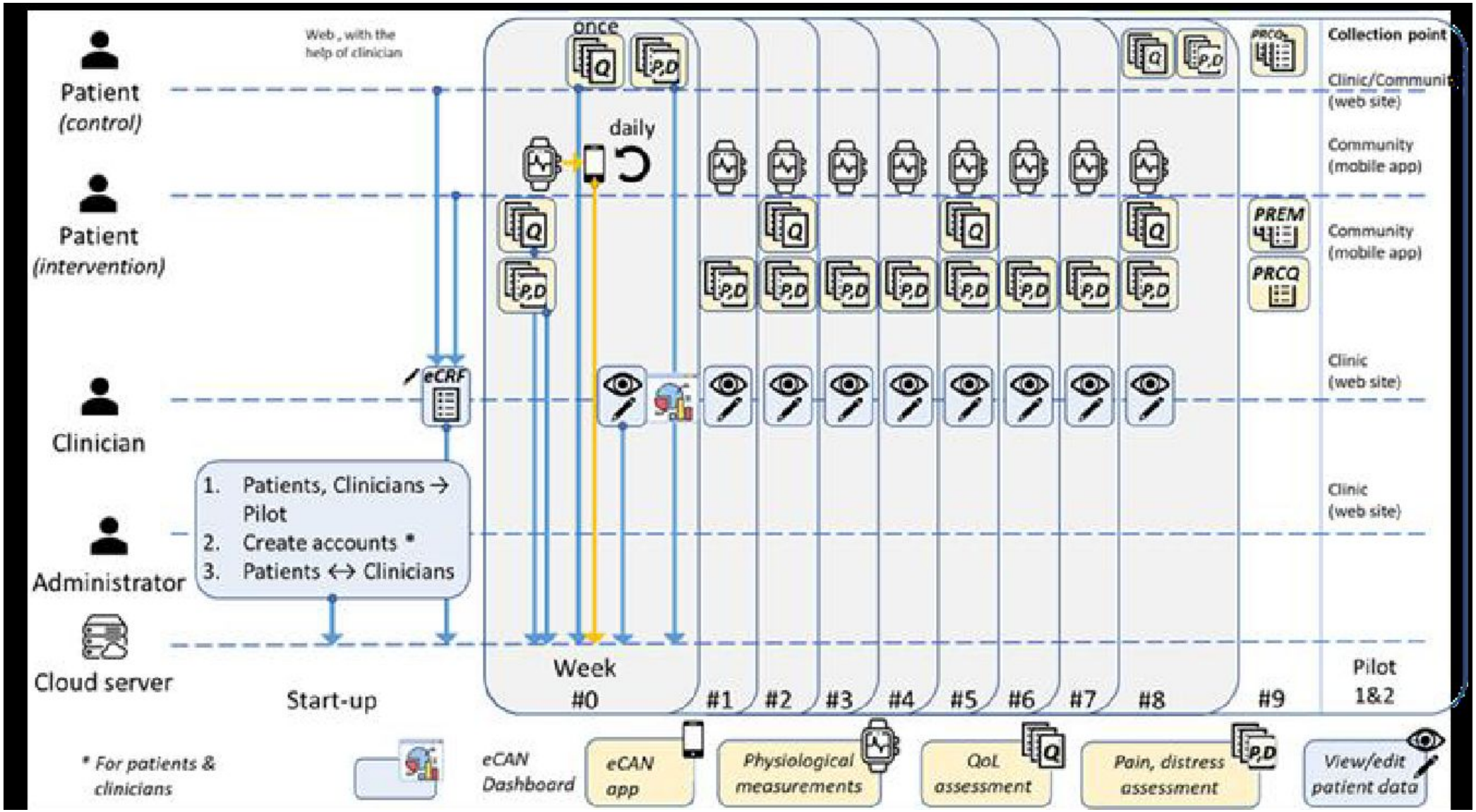
Place a mark on the line below to indicate your current level of pain².

0 — 10

No pain — Pain as bad as it could possibly be

Please ensure you print this document to scale so that the VAS line is 10cm long.

# Data monitoring and tele-rehabilitation or tele-psychological support plan



# Pilot 1A - Breast Cancer: Descriptive Statistics

Control group N= 57 | Intervention group N= 50

## Gender

♀ 57 | ♂ 0

♀ 50 | ♂ 0

## Age

54 (min. 40 - max 65)

53 (min. 44 - max 65)

Median

## European geographic area

| Control group | | | Intervention group | | |
|---|---|---|---|---|---|
| 11 | 11 | 35 | 8 | 10 | 32 |
| NORTH | MIDDLE | SOUTH | NORTH | MIDDLE | SOUTH |

## ECOG

| Control group | | Intervention group | |
|---|---|---|---|
| 0-1 | 2-3 | 0-1 | 2-3 |
| 40 | 2 | 38 | 0 |

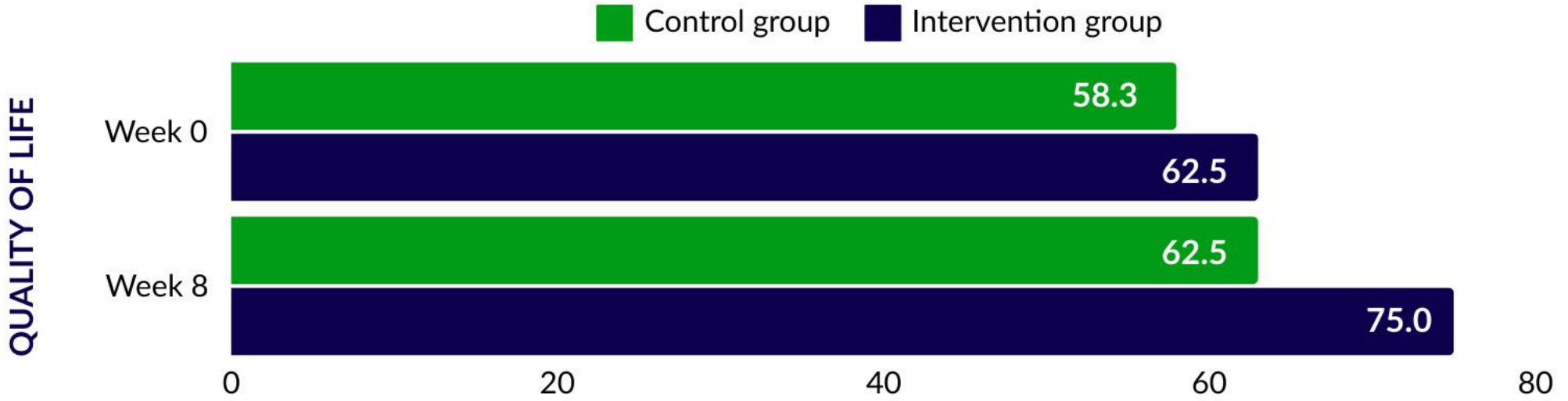
## Comorbidities

| | YES | NO | UNKNOWN |
|---|---|---|---|
| Control group | 15 | 36 | 1 |
| Intervention group | 9 | 33 | 1 |

## Residence Place

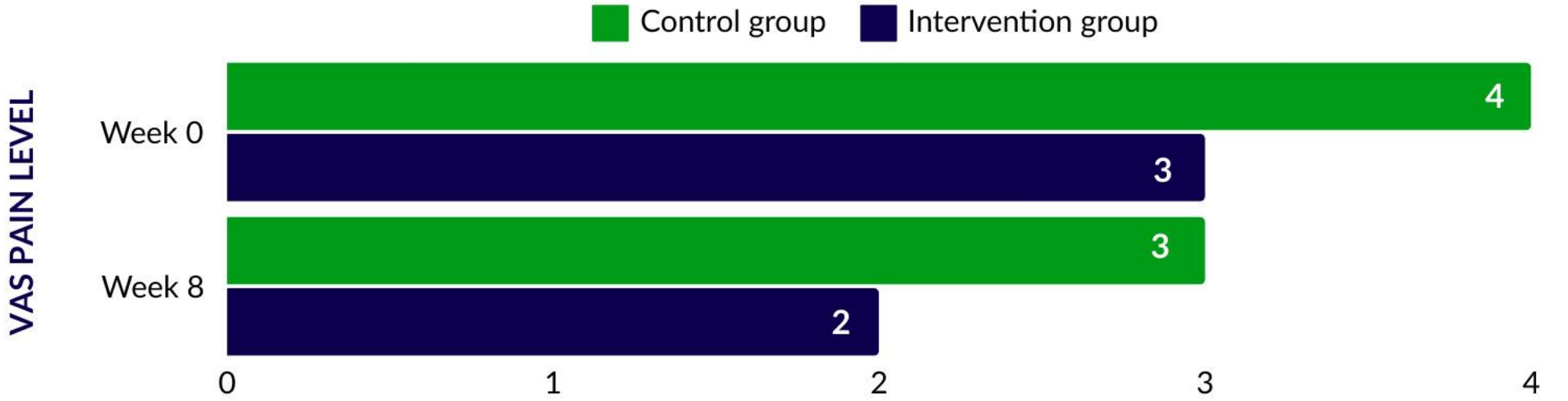
| | CITY ≥100.000 | CITY <100.000 | RURAL AREA CLOSE TO THE CITY | RURAL AREA FAR FROM THE CITY |
|---|---|---|---|---|
| Control group | 21 | 20 | 13 | 3 |
| Intervention group | 19 | 21 | 9 | 1 |

# Results Pilot 1A: Breast Cancer




| Time | p-value* |
|---|---|
| Week 0 | 0.690 |
| Week 8 | 0.047 |

*Comparison (median values) at Week 0 (start) and at Week 8 (end) between the two arms in terms of Quality of Life (Global Health). *Mann-Whitney test*




| Time | p-value* |
|---|---|
| Week 0 | 0.031 |
| Week 8 | 0.032 |

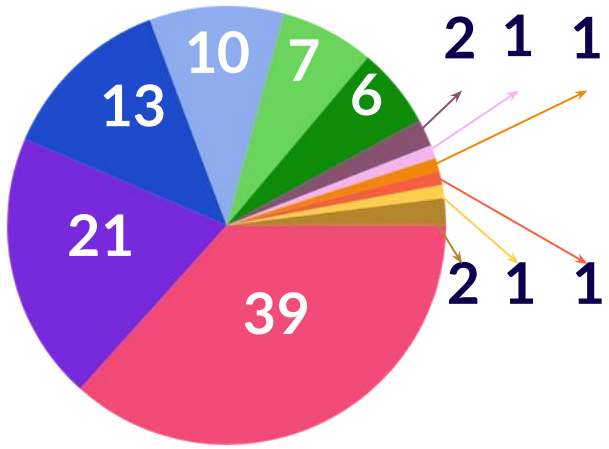
*Comparison (meidan values) at Week 0 (start) and at Week 8 (end) between the two arms in terms of pain level Visual Analogue Scale (VAS). *Mann-Whitney test*

# Pilot 2 - Advanced Cancer: Descriptive Statistics

Control group N= 50

Intervention group N= 54

## Type of cancer




Breast | Prostate | Cutis
Lung | Urological | Sarcoma
Colorectal | Gastric | Melanoma
Gynaecological | Testicular | Other

## Gender

♀ 35 ♂ 15

♀ 36 ♂ 18

## Age

51 min. 23 - max 73

50 min. 23 - max 74

Median

## European geographic area

| | NORTH | MIDDLE | SOUTH |
|---|---|---|---|
| Control group | 12 | 12 | 26 |
| Intervention group | 12 | 13 | 29 |

## ECOG

| | 0-1 | 2-3 |
|---|---|---|
| Control group | 32 | 6 |
| Intervention group | 25 | 8 |

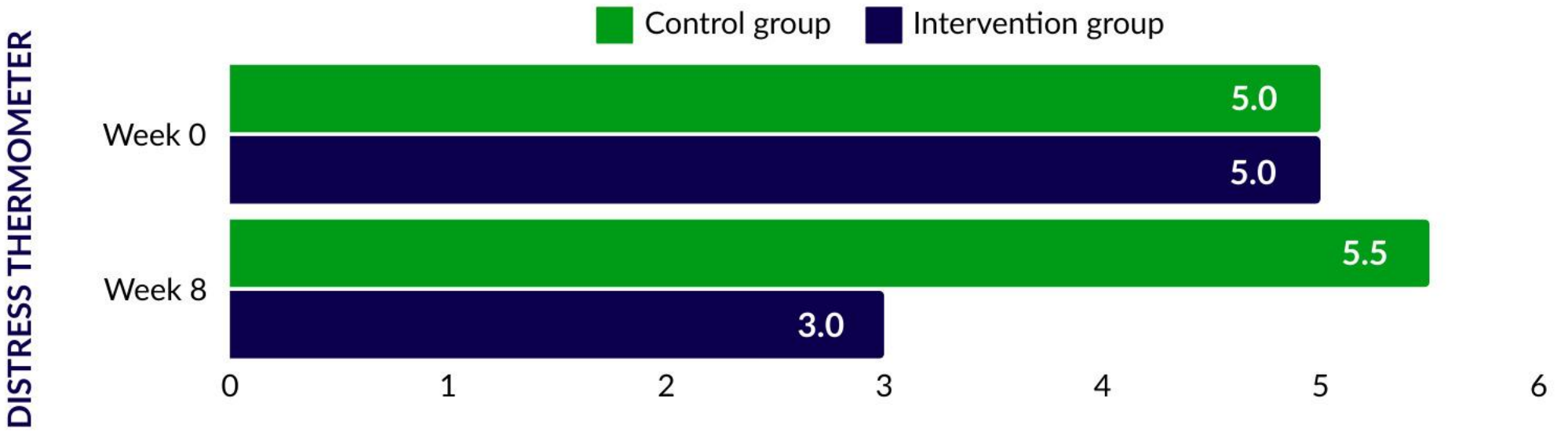
## Comorbidities

| | YES | NO | UNKNOWN |
|---|---|---|---|
| Control group | 14 | 21 | 8 |
| Intervention group | 14 | 24 | 9 |

## Residence Place

| | CITY ≥100.000 | CITY <100.000 | RURAL AREA CLOSE TO THE CITY | RURAL AREA FAR FROM THE CITY |
|---|---|---|---|---|
| Control group | 18 | 17 | 13 | 2 |
| Intervention group | 21 | 11 | 19 | 1 |

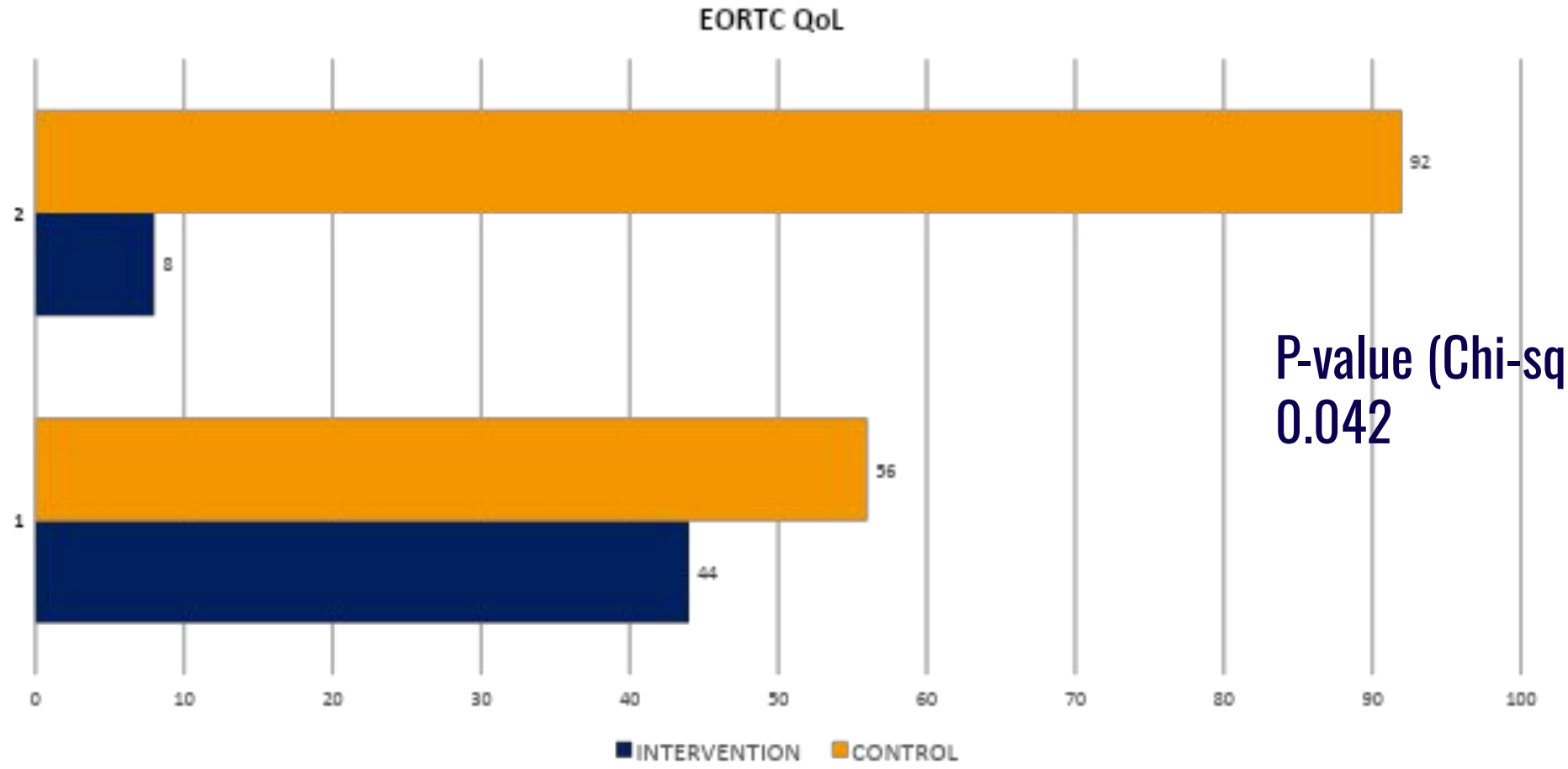
# Results Pilot 2: Advanced Cancer




| Time | p-value |
|---|---|
| Week 0 | 0.710 |
| Week 8 | 0.039 |

*Comparison (median values) at Week 0 (start) and at Week 8 (end) between the two arms in terms of distress thermometer.*

# Missing data QoL Pilot 1a



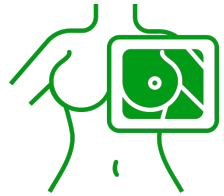

P-value (Chi-square)= 0.042

# Highlights of the Pilots Results

## Pilot 1A: Breast Cancer

**Telemedicine** seems to have been effective and positive on patients who received it. Results point that **patients' Quality of Life improved, compared to their baseline values,** after receiving telerehabilitation support.

Breast cancer patients appeared to be compliant to the telemonitoring system, resulting in less missing values, than patients enrolled in the other pilots.



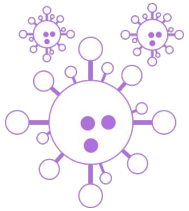
## Pilot 1B: Head and Neck Cancer

The pilot on head and neck cancer patients did not reach any significant conclusion due to small sample size.

## Pilot 2: Advanced Cancer

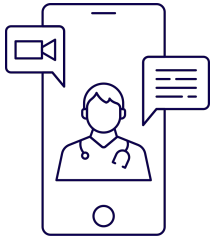
Our results suggest tele-psychological support **reduces cancer patients' distress**, decreasing its values from their point of reference.

However, **the same effect is not observed in their quality of life**.



## Remarks on Telemedicine

**Telemedicine** may be an **adequate support for cancer patients**. Using a dedicated **APP could be useful** to improve patients compliance to Patient Reported Outcomes Measures (PROMs) data collection.



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# eCAN WP6 aims

The WP6 acitivities was focused to **organizational level of telemedicine activities**, with the aim to address **legal framework** and **cyber security issues in telemedicine**

Cybersecurity is increasingly becoming a prominent concern among healthcare providers in adopting digital technologies for improving the quality of care delivered to patients.

The increasing utilization of telemedicine tools requires new policy, regulations and **guidelines to better address patients' rights, equity of access, protection of privacy and health data protection from cyber attacks**

# Lesson learned

The pilots conduction with the involvement of 18 European clinical centers was a great opportunity to evaluate the large variability in telemedicine capabilities, GDPR interpretation, patients' data protection approach.

**Stakeholder training**

Need to increase the telemedicine literacy

**Harmonization of secondary data utilization**

**Ethical issues**

The utilization of telemedicine tools may introduce a risk of equity of access

EU4Health work programme

Co-funded by the European Union

**EU4H-2024-JA-IBA-02 — Direct grants to Member States' authorities: Strengthening digital capabilities including e-health, telemedicine, remote monitoring systems, health data access and health data exchange services in cancer centres in the Union (CR-g-24-36)**

*Expected impact*

As an expected outcome of the activities, the cancer centres will receive improved tools to ensure justification and optimisation of digital technologies, including e-health, telemedicine and remote monitoring systems, health data access and health data exchange services

**27 countries**
**4 years**
**20M EUR budget**


# DELIVERABLE 5.3: FINAL CLINICAL STUDY ANALYSIS

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ecanja.eu

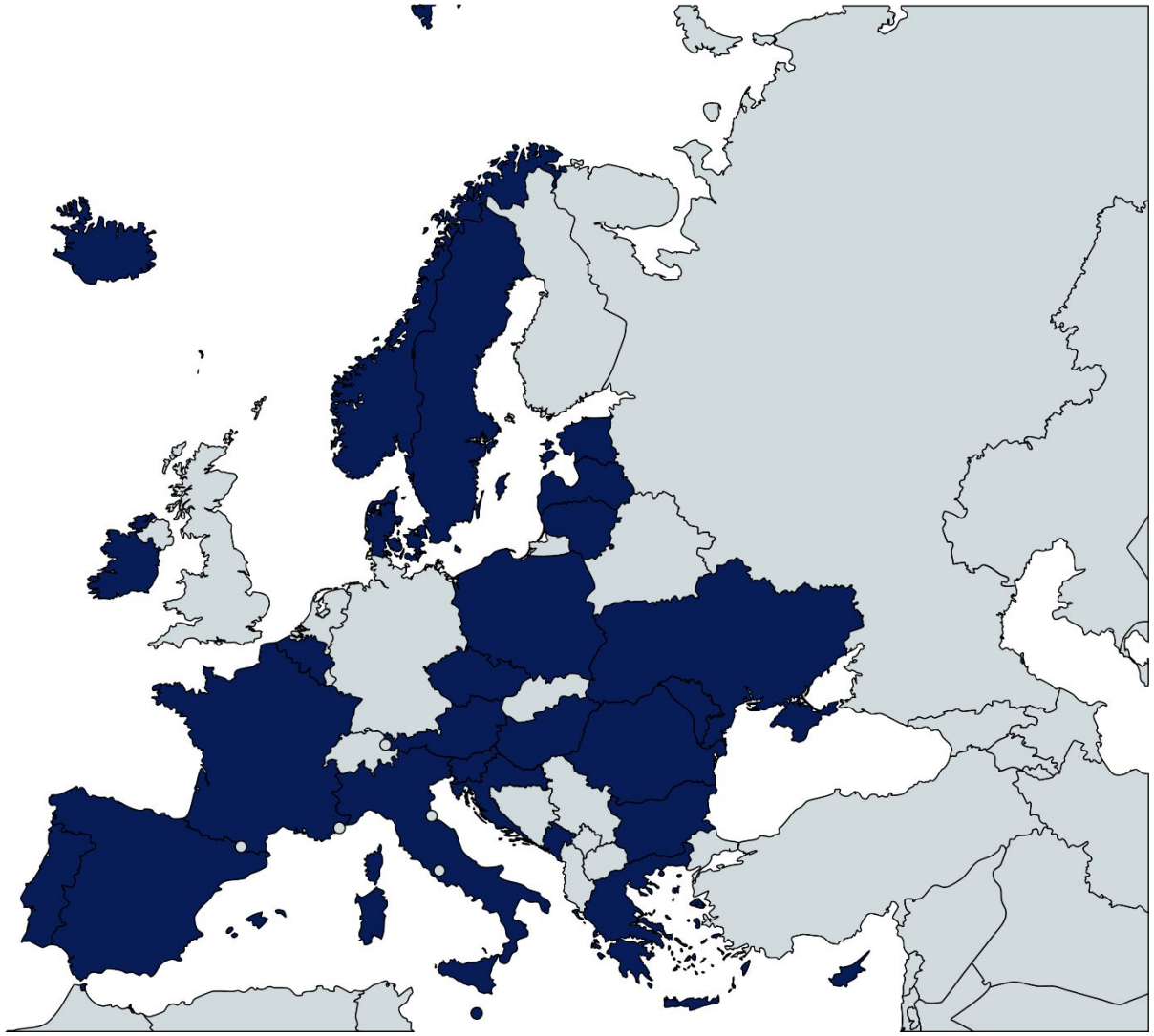
# Follow up JA after eCAN - Participants

**eCAN**
**35 partners**
**16 countries**
***Closed Nov 2024***

| |
|---|
| Austria |
| Belgium |
| Cyprus |
| Denmark |
| Greece |
| Hungary |
| Ireland |
| Italy |
| Lithuania |
| Malta |
| Norway |
| Poland |
| Portugal |
| Slovak Republic |
| Slovenia |
| Spain |

**eCAN+**
**94 partners**
**27 countries**
***Started May 1th 2025***

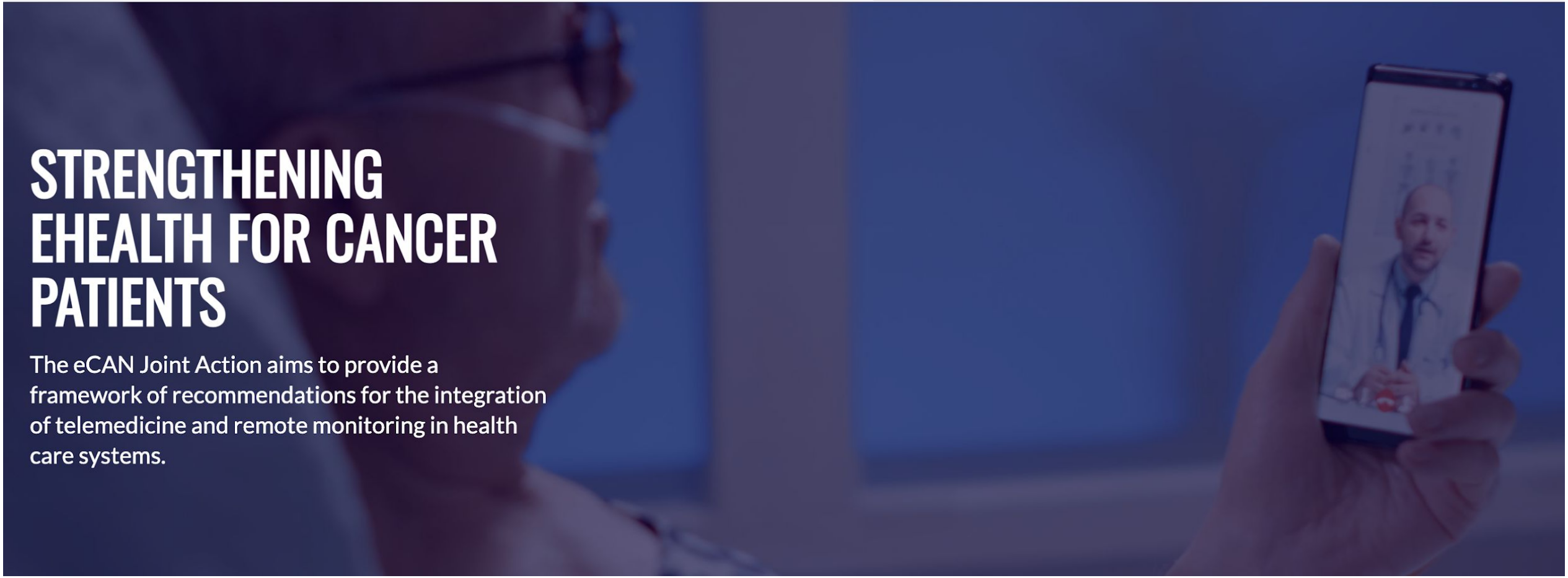
| |
|---|
| Austria |
| Belgium |
| Bulgaria |
| Croatia |
| Cyprus |
| Czechia |
| Denmark |
| France |
| Estonia |
| Greece |
| Hungary |
| Iceland |
| Ireland |
| Italy |
| Latvia |
| Lithuania |
| Malta |
| Moldova |
| Montenegro |
| Norway |
| Poland |
| Portugal |
| Romania |
| Slovenia |
| Spain |
| Sweden |
| Ukraine |



# Overview of proposed pilots and use cases in eCAN+

- Pilot of EU Mobile App for Cancer Prevention (BUMPER)
- Use case focusing on training materials developed
- Use case focusing on virtual molecular tumour boards
- Use case focusing on discharge conferences
- Pilot of telemedicine in survivorship setting (Cancer Survivor Smart Card)
- Pilot of telemedicine in treatment setting
- Pilot of telemedicine in palliative care setting
- Pilot of telemedicine focusing on support for informal caregivers

eCAN
Strengthening eHealth for Cancer Prevention & Care



# STRENGTHENING EHEALTH FOR CANCER PATIENTS

The eCAN Joint Action aims to provide a framework of recommendations for the integration of telemedicine and remote monitoring in health care systems.

WP1 – Coordination

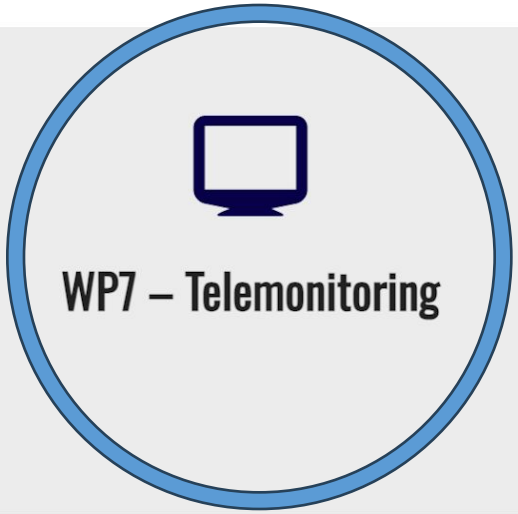
WP2 – Communication

WP3 – Evaluation

WP4 – Sustainability

WP5 – Teleconsultation

WP6 – Legal, ethical framework and cybersecurity




WP8 – Stakeholders Engagement

Pilot format

| PROMS data collection | Televisit | In presence visit | Outcome evalutation |
|---|---|---|---|
| EORTC QlQ C30<br>Symptoms scale<br>IPOS - VAS pain Distress thermometer | Tele-consultation<br>Tele-rehabilitation<br>Tele-cognitive screening<br>Tele-psycho-support<br>Tele coaching | Usual care | PROMs<br>PREMs<br>Feasibility<br>Compliance |

**Needs of care assessment with PROMs** → **Telemedicine or in presence cancer care** → **Evaluation**

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**SEMINAR SERIES Synergies between Italy and Europe in the Fight Against Cancer**

***Improving the Quality of Care through the Use of Health Data***

**September 18, 2025 - ONLINE**
**10:00 am - 12:00 pm**

# GRAZIE PER L'ATTENZIONE !!!