



ONCORELIEF

a H2020 project supporting the development of an
App and AI system for assisting
cancer patients' improvement of wellbeing and quality of life

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**A digital guardian angel app
based on a patient-centered AI system to
enhancing cancer patient's wellbeing and health status
improvement following treatment**

Horizon 2020 Call: H2020-SC1-DTH-2018-2020

Topic: SC1-DTH-01-2019: Big data and Artificial Intelligence for monitoring health status and quality of life after the cancer treatment.

Type of Action: Research and Innovation Action (RIA)

Proposal number: 875392

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- Nowadays technology can assist professionals and patients by using Big Data and Artificial Intelligence in monitoring in real time patients' health condition.
- The growth of big data in oncology will provide unprecedented **opportunities to explore the biopsychosocial characteristics of this disease** and for descriptive observation, hypothesis generation, and prediction for clinical, research and business issues.





The ONCORELIEF vision

ONCORELIEF is a 36-month action that will allow the utilization of big datasets in order to develop a user-centred AI system, facilitating the integration of quality of life assessment instruments using PROMs and PREMs, with the objective to **improve:**

- ❖ **post-treatment health status**
- ❖ **wellbeing**
- ❖ **and follow-up care of cancer patients**

This will be achieved through **an intuitive smart digital assistant (Guardian Angel)**, able to **utilize big data analytics** to provide personalized support in post-treatment activities and tasks, suggest actions regarding the patients' overall health-status, improved QoL and WB and active health-care and ultimately maintain him/her engaged on a wellness journey that will safeguard his/her health over the foreseeable prolonged post-cancer treatment period.





AIMS:

- to validate in real-world settings **the development of a patient-centered AI system** which inputs, analyses and integrates **big datasets from the biopsychosocial and environmental dimensions** of patients with cancer, to improve post-treatment health status, increase their wellbeing and QoL (quality of life), and assist the follow-up care of cancer patients.
- The AI system will generate an ongoing **QoL Index** and a **smart digital assistant (Guardian Angel) for smartphones** will provide personalized support to cancer patients in post-treatment activities and tasks and suggest actions regarding the patients' overall health-status and QoL index.





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| Participant No * | Participant organisation name | Acronym | Country |
|------------------|---|---------|---------|
| 1 (Coordinator) | EXUS LTD | EXUS | UK |
| 2 | MAGGIOLI SPA | MAG | IT |
| 3 | INNO SYSTEMS LTD | INNO | GR |
| 4 | CARE ACROSS | CARE | UK |
| 5 | CENTER FOR RESEARCH AND TECHNOLOGY | CERTH | GR |
| 6 | SUITE5 DATA INTELLIGENCE SOLUTIONS LTD | SUITE | CY |
| 7 | FRAUNHOFER ITWM | FHG | DE |
| 8 | UNIVERSITY MEDICAL CENTER MAINZ | MAINZ | DE |
| 9 | MCS DATA LABS | MCS | DE |
| 10 | FCIÊNCIAS.ID - ASSOCIAÇÃO PARA A INVESTIGAÇÃO E DESENVOLVIMENTO DE CIÊNCIAS | FC.ID | PT |
| 11 | TIME.LEX CVBA/SCRL ADVOCATENKANTOOR | TIMELEX | BE |
| 12 | UNIVERSITÀ DI BOLOGNA | UNIBO | IT |
| 13 | ISTITUTO SCIENTIFICO ROMAGNOLO PER LO STUDIO E LA CURA DEI TUMORI S.R.L. | IRST | IT |

H2020 funded project consortium
13 partners
8 EU countries

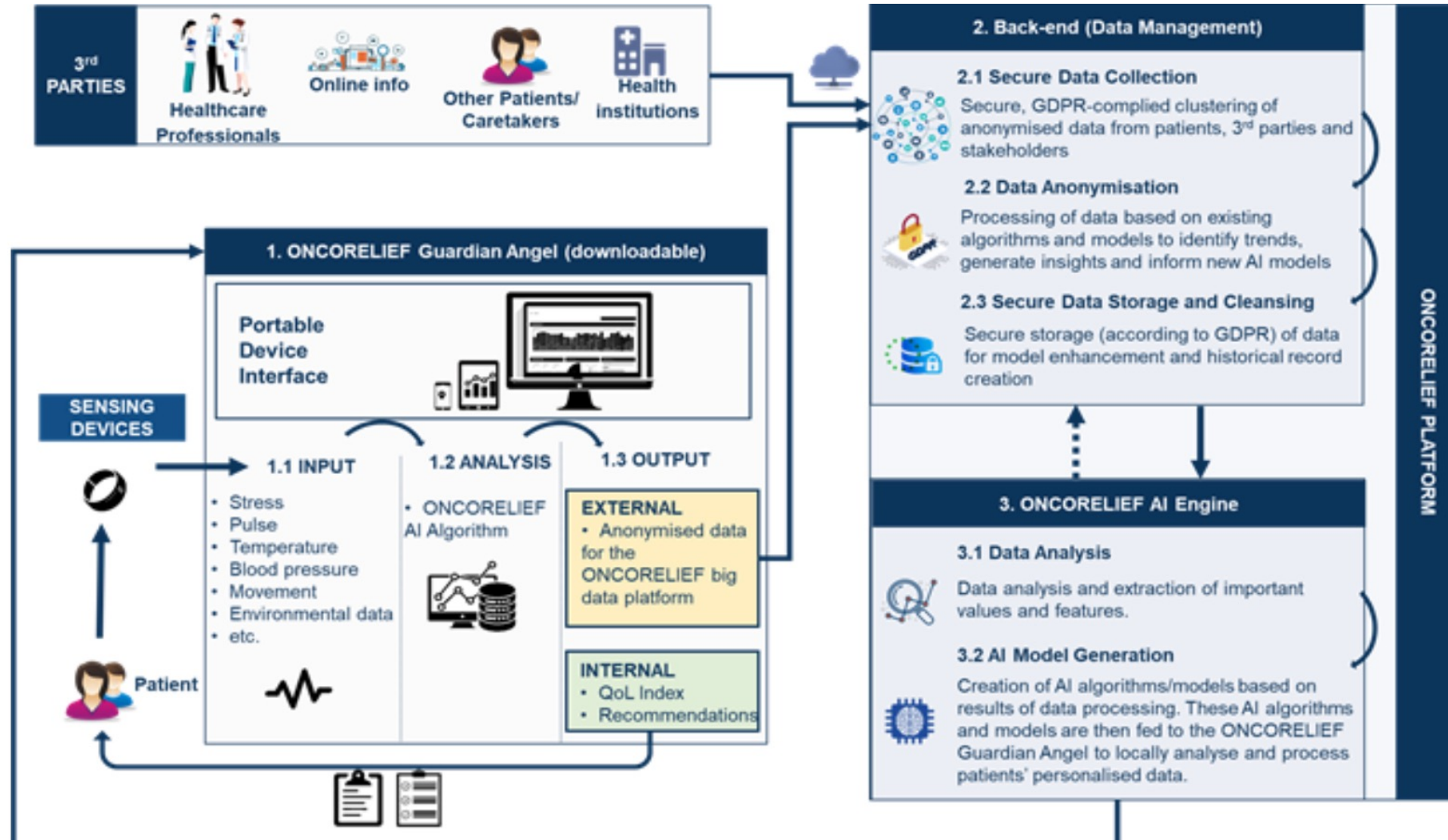
interdisciplinary industry-driven consortium brings together state-of-the-art **technological skills, design thinking methodology** and **psychology/health sciences.**



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4 innovations namely:

(i) an index (ONCORELIEF wellbeing and QoL Index) constantly reflecting the patients' quality of life and well-being levels;

(ii) a digital assistant (ONCORELIEF Guardian Angel), running on a smartphone, supporting the patient in post-treatment everyday activities;

(iii) the application of AI features for personalizing the digital assistant;

(iv) the implementation of data analytics for monitoring the patients' post-treatment activities.





- ONCORELIEF will develop a personal **WB and QoL Index**
- **This index** is a measure of the balance of met and unmet biopsychosocial needs of patients with cancer.
- It is based on the scores of the questionnaires and other assessment tools (e.g., medical records, wearables) that measure each of the specific needs, and converts all the input data on a 0 to 1000 score.
- Higher Index scores indicate that patients have more met needs than unmet needs, lower index scores indicate the opposite.
- **The index is based on patients' critical needs** allowing easy identification of unmet needs and the proposal of personalized interventions to help patients overcome this imbalance.
- The ONCORELIEF wellbeing and QoL Index moves up or down in real-time, depending on the balance of met and unmet needs and its change
- When tracked over time, it will offer a **good indicator of how the person's health and wellbeing is evolving.**



5. **The ONCORELIEF Sensing Framework.** The unobtrusive and pervasive, wearable and embedded sensing ecosystem of the patient for data collection.

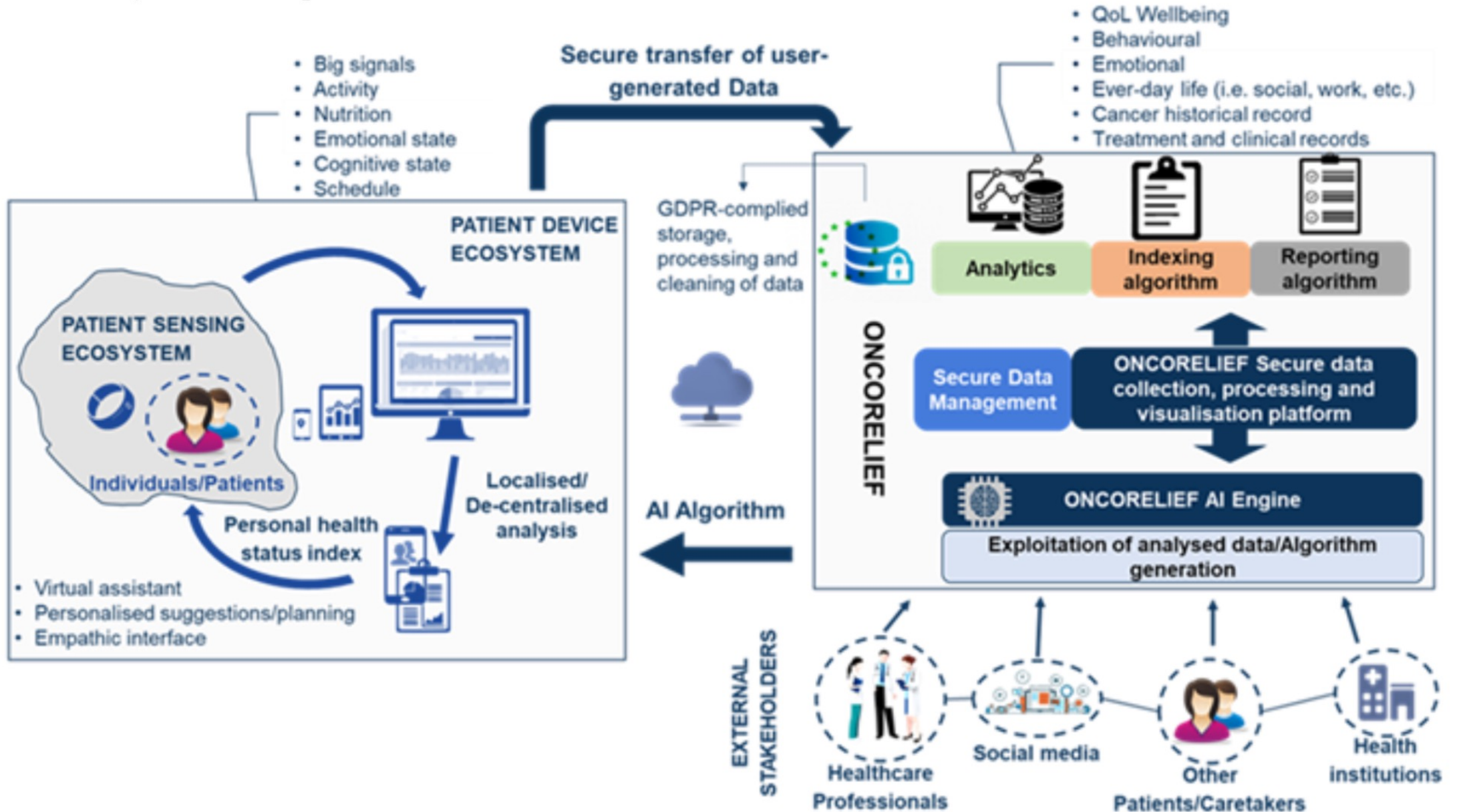


Figure 4: ONCORELIEF Architecture.



Methods

To validate the approach of ONCORELIEF based on Big Data and Artificial Intelligence, 2 pilots will be executed.

Pilot 1 will include Colorectal Cancer patients and
Pilot 2 Acute Myeloid Leukemia patients.

Each Pilot will recruit 300 patients.

ensuring the future applicability and its extension to other types of cancer. Ultimately, **ONCORELIEF can be delivered as a cancer type-agnostic suite that can be properly adjusted to fit the needs of specific cancer types** as per their unique requirements.



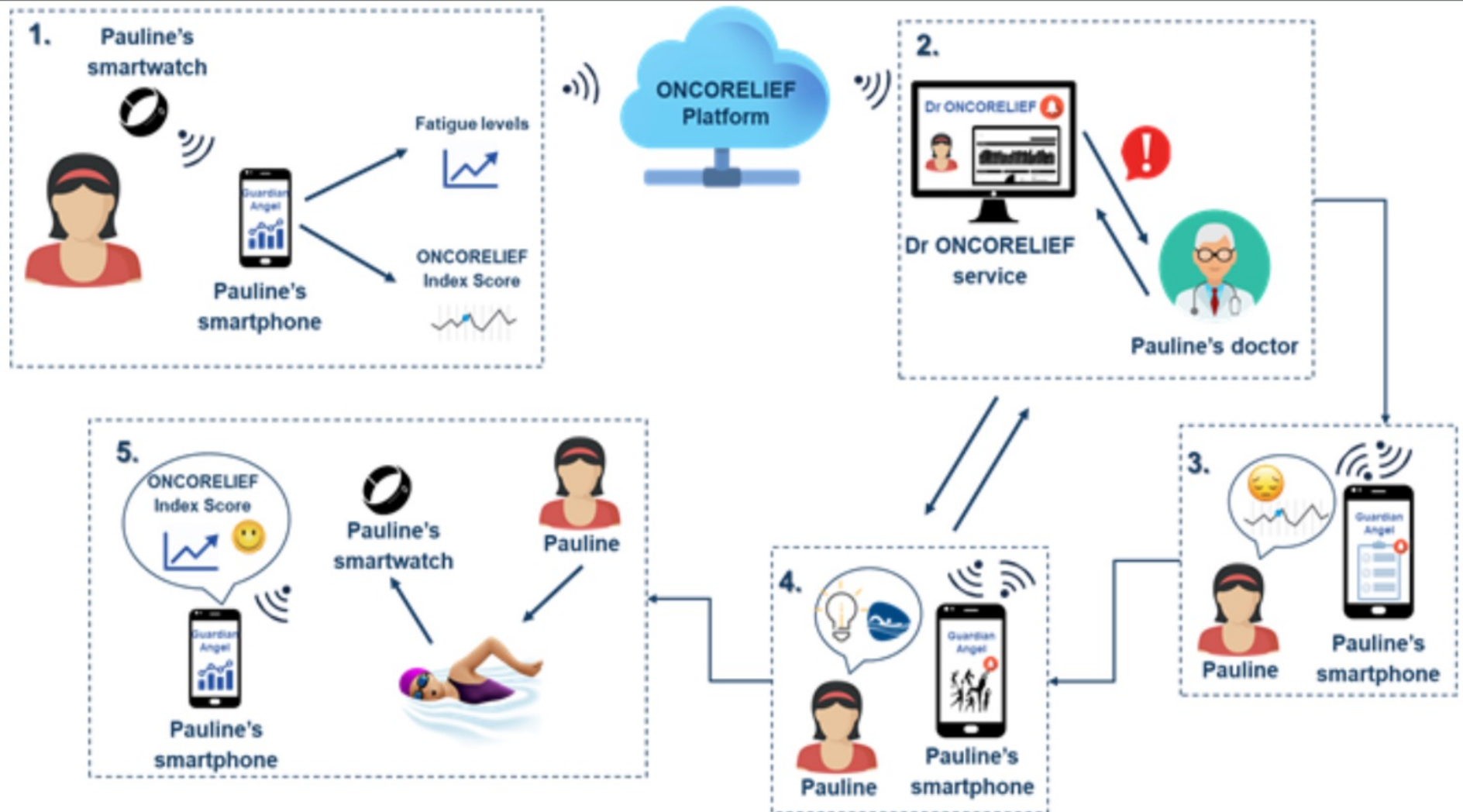


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ONCORELIEF Interventions:

(a) Monitoring QoL index, (b) Recording activity, (c) Connecting with health-care professional, (d) Inspiring motivation, (e) Providing recommendations to increase health-status.

Illustration:





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ADDED VALUE FOR THE PATIENT

- Improved quality of life, symptom management and satisfaction with care/ treatment procedures.
- Better handling of secondary effects and complications like fatigue, cognitive limitations, pain and sexual dysfunction
- Enhanced ability to reduce risk of new medical conditions and improve health status.
- Receive personalized QoL-based care for alleviating symptoms associated with cancer and its treatment - 'survivorship care' tailored to their specific
- Improved communication with health-care professionals especially for dealing with symptoms that are not obvious or first-priority but may individually need additional attention
- Enhanced personal confidence driven by the ongoing monitoring that allows patients to remain optimistic and improve their outlook on life based on the holistic support system available to them.



ADDED VALUE FOR PROFESSIONALS AND HEALTH CARE ORGANIZATIONS

- Improved knowledge, availability of data and capabilities for offering personalized, patient-specific support (medical and psychological), on top of any applied treatment method.
- Improved access to patient-specific health and wellbeing status.
- Structured PROMs & PREMs, which can be juxtaposed with patient-specific data, leading to improved understanding of patient outcomes and experiences on an individual or group level
- Access to Real World Data which can constitute the basis for Real World Evidence which is currently the most critical missing piece from the point of care and research perspective.
- Access to information on patient side-effects that would otherwise be unreported
- Ability to improve the design of clinical trials based on extensive and structured patient input.
- Reduced readmissions and hospitalizations driven by better quality of life, fewer new medical conditions, improved management of overall health and wellbeing
- Enhanced flexibility in patient care as many aspects can be delivered asynchronously and remotely





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Kick-off meeting
Athens, January 2020
ONCORELIEF
Consortium



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