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CANCER INITIATIVE

# Digital and AI technologies for cancer care: current examples

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# Introduction



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This slide deck is a companion to an expert snapshot commissioned by Moondance from Dr Jonathan Gregory: [Digital cancer solutions](#). It is intended as an easy-to-use summary of some exciting digital cancer technologies that Dr Gregory highlights as having real potential to improve services and outcomes.

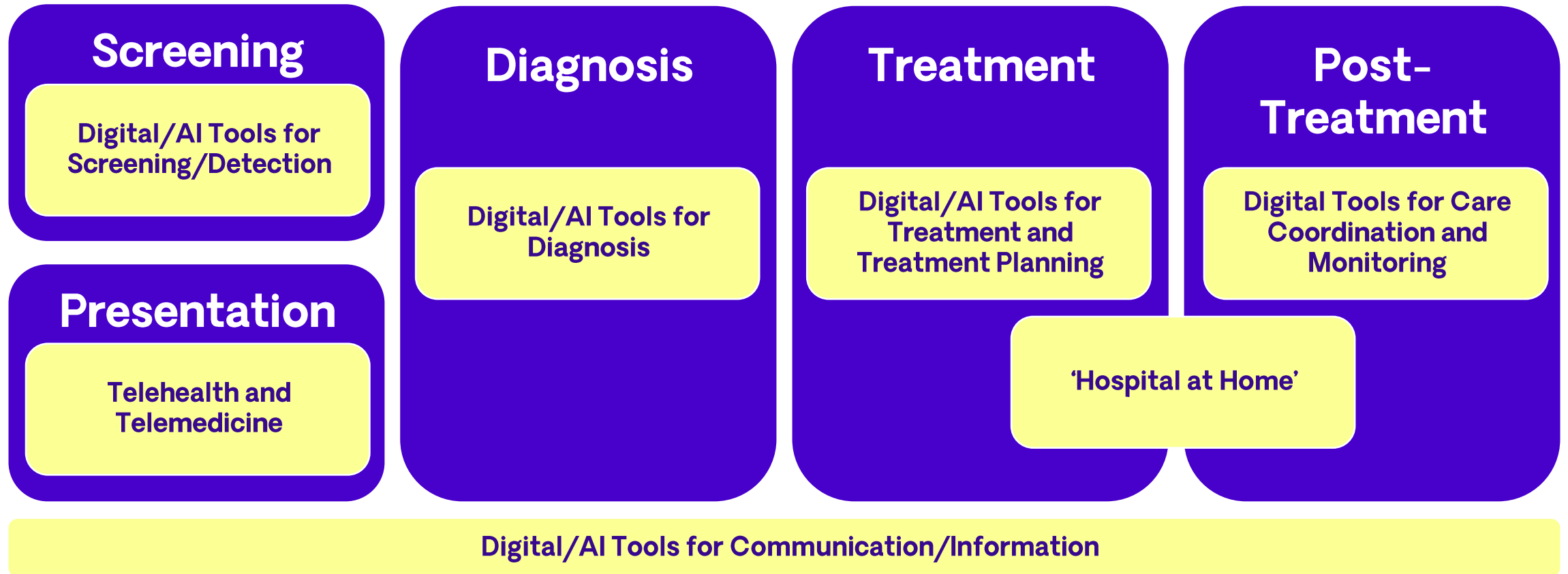
If you would like to find out more, you can read Dr Gregory's Guide to digital health, and Landscape of innovations for digital cancer care [reports](#).

As in the report, inclusion of any product here is illustrative, and **does not represent endorsement**.

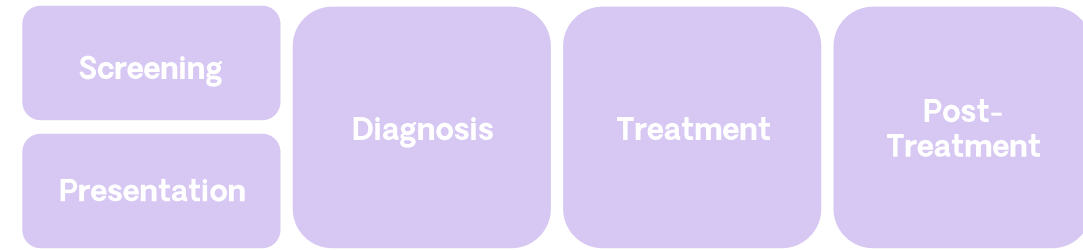
*Moondance Cancer Initiative funds and fuels people to make bold ideas happen. If this snapshot sparks your interest, and you're in a position to trial new tech for patients in Wales, please do get in touch.*

# Overview

Categories of digital innovations for cancer care include:



# Communication and Information



## Digital tools

- Social media campaigns can increase [screening and early diagnosis rates](#).
- This may be best targeted during '[waves](#)' of interest in cancer.
- [Online communities](#) can help patients improve understanding of treatment and self-manage their cancer journey.
- [Apps](#) can provide psychological support for isolated people in a low-cost, scalable way.

## AI tools

- AI platforms which [record and annotate clinical consultations](#), providing colour coded tags to information on treatment and other care.
- [Virtual reality technology](#) can prepare patients for treatment such as radiotherapy or surgery.

# Screening



## Digital tools

- [Social media campaigns](#) can increase screening adherence.
- [Text messaging](#) can increase screening adherence in a low-cost manner.
- [Mobile phone cameras](#) can be used as [screening devices](#).

## AI tools to assist screening

- [Mobile screening](#) for skin cancer is a large and still developing field.
- [An AI programme](#) can assist in monitoring bowel screening colonoscopy quality.
- [AI programmes](#) can triage no-risk radiology images to safely reduce caseload.

# Screening

## AI tools to assist screening

Screening

Diagnosis

Treatment

Post-Treatment

Presentation

Name	PinPoint Data Science
Website	<a href="https://www.pinpointdatascience.com/">https://www.pinpointdatascience.com/</a>
Available?	Soon (within 3 years)
Product	Algorithm which analyses routine blood results, to give a percentage risk of cancer. <a href="#">In first use case</a> , identifies a cohort with low (>5%) risk of cancer reducing USC usage by ~20%. It also has an algorithm which can try to identify those cases with a very high risk of having underlying cancer for referral prioritization.
Status	CE marked for 9 cancers.

pinpoint

# Screening

## AI tools to assist screening

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Presentation

Name	MIA Mammography
Website	<a href="https://www.kheironmed.com/products/mia-reader/">https://www.kheironmed.com/products/mia-reader/</a>
Available?	Soon (within 3 years)
Product	AI software which performs the second of two standard mammography reads in breast screening. If MIA and the first reader agree, then the first diagnosis is used. If they disagree, result is confirmed by second radiologist.
Status	Completed successful evaluation in East Midlands Radiology Consortium, funded by NHSx for health system adoption, being deployed across 15 hospital sites in the UK for further evaluation.

# Screening

## AI tools to assist screening

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Diagnosis

Treatment

Post-Treatment

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Name	Lunit Mammography
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Website	<a href="https://www.lunit.io/en">https://www.lunit.io/en</a>
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Available?	Soon (within 3 years)
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Product	AI software which analyses breast screening mammography for possible cancer. Evaluation suggests it performs significantly better than a single radiologist. When used as a second reader, workload is dramatically, reduced, while <a href="#">sensitivity and specificity for breast cancer are both &gt;90%</a> . More sensitive than radiologists for T1 and node-negative cancers – the patients most likely to benefit from screening.
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Status	CE marked and approved for commercial sales in Europe and Korea.
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# Screening

## AI tools to assist screening



Name	Behold.AI Chest x-ray reporting
Website	<a href="https://behold.ai/">https://behold.ai/</a>
Available?	Soon (less than 3 years)
Product	AI software which can safely label a chest x-rays as normal and automatically generate a report. If any abnormalities are detected, or the software is unsure, images are passed to a radiologist. Reduction in the workload of radiologists should thereby enable same-day reporting.
Status	Funded by NHSx for initial health system adoption.

# Screening

## AI tools to assist screening



Name	Faculty AI – Breast Screening Planning Tool
Website	NA
Available?	Soon (less than 3 years)
Product	AI which automatically performs breast screening round length planning, matching demand and capacity, in what was previously a manual process. Through this, it hopes to save significant admin workload, and reduce variation in practice.
Status	Being prepared for rollout for further evaluation.

# Screening

## AI tools to assist screening

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Presentation

Name	Advanced expert systems Ltd.
Website	<a href="https://www.aesgrp.com/">https://www.aesgrp.com/</a>
Available?	Later (more than 3 years)
Product	AI algorithm, which can combine FIT testing with other patient data available on their EPR, stratifying patients into low- and high-risk groups for colorectal cancer so delivering colonoscopy urgently to those most likely to have an underlying cancer.
Status	Feasibility testing funded by NHSx.



# Telehealth and Telemedicine



- Use of telehealth to support team working is constantly expanding, e.g. with virtual MDT meetings. The usefulness of this will increase as digitized radiology and pathology images become more widely accessible and easily transferable.
- Virtual consultations are enabled in Wales through the [Attend Anywhere](#) platform.
  - Patient satisfaction is generally very high, and evaluation of 12,000 respondents indicated ~150,000 hours travel time were saved by the platform.
  - Outstanding issues remain: exclusion of ethnic minority groups, clinicians encountering technical issues, and possible privacy issues in inhabitants of multi-residency homes.

# Diagnostics



## Digital tools to assist in cancer diagnosis

- The [Munich Leukaemia Laboratory](#) have developed a comprehensive digital diagnostic service based upon genome sequencing and a human-specified decision tree, reducing diagnostic workload.

## AI tools to assist in cancer diagnosis

- A new AI can [interpret molecular pathways and key mutations in colorectal cancer](#) from standard histology slides.
- An [AI showed favourable performance](#) compared to humans in diagnosing and grading prostate cancer, reducing inter-reader variability.

# Diagnostics

## AI tools to assist in cancer diagnosis

Screening

Diagnosis

Treatment

Post-  
Treatment

Presentation

Name	Paige AI – Prostate
Website	<a href="https://www.paige.ai/">https://www.paige.ai/</a>
Available?	Soon (less than 3 years)
Product	AI software which supports pathologists in diagnosing prostate cancer, automatically identifying and focusing clinically relevant parts of the image. Aims to reduce workload of pathology manually scanning the slide, without replacing the pathologist as the decision-maker.
Status	NHSx funded for initial health system adoption.



PAIGE

# Diagnostics

## AI tools to assist in cancer diagnosis

Screening

Diagnosis

Treatment

Post-  
Treatment

Presentation

Name	FORE-AI (endoscopy enhancement)
Website	<a href="https://odin-vision.com/">https://odin-vision.com/</a>
Available?	Later (more than 3 years)
Product	AI that acts as a decision-support tool during colonoscopy, drawing the endoscopists' attention to areas of the bowel wall detected as abnormal. The endoscopist still makes all diagnostic and treatment decisions, but with risk of error through missing features mitigated.
Status	Funding awarded by NHSx for valuation in multiple hospitals.



# Diagnostics

## AI tools to assist in cancer diagnosis

Screening

Diagnosis

Treatment

Post-Treatment

Presentation

Name	IBX Medical Analytics – Prostate
Website	<a href="https://ibex-ai.com/press/uk-ai-award/">https://ibex-ai.com/press/uk-ai-award/</a>
Available?	Later (more than 3 years)
Product	AI software which directly makes prostate cancer, and other clinically important diagnoses from pathology images.
Status	Under clinical and cost-effectiveness evaluation at Imperial College London, with NHSx funding.

IBEX



# Treatment and Treatment Planning



**Digital tools to assist in treatment/treatment planning**

Name	Navify MDT Software (Roche)
Website	<a href="https://www.navify.com/">https://www.navify.com/</a>
Available?	Now
Product	MDT support software, which pools all clinical data, supports curation of meeting, and automatically identifies clinical trials relevant to cases. Evaluation shows decreased likelihood of cases being deferred due to lack of data, and sped up time to treatment.
Status	Available for use.

**NAVIFY®**

# Treatment and Treatment Planning



## AI tools to assist in treatment/treatment planning

Name	Deontics MDT clinical decision support
Website	<a href="https://deontics.com/">https://deontics.com/</a>
Available?	Soon (with 3 years)
Product	AI platform to identify and triage 'non-complex' cancer cases, guiding a single clinician through a treatment decision, with functionality for patient input. Aims to allow more time and energy for complex case discussion in MDTs.
Status	Funded by NHSx for real-world testing.

# Treatment and Treatment Planning

Screening

Presentation

Diagnosis

Treatment

Post-treatment

## AI tools to assist in treatment/treatment planning

Name	Mirada Medical – Radiotherapy Planning
Website	<a href="https://mirada-medical.com/">https://mirada-medical.com/</a>
Available?	Soon (within 3 years)
Product	Suite of AI tools in development to support radiotherapy, such as with in clinical oncologists' planning and contouring scans. Aiming to reduce oncologists' workload.
Status	Funded by NHSx for initial health system adoption.

# Treatment and Treatment Planning



## AI tools to assist in treatment/treatment planning

Name	Therapanacea
Website	<a href="https://www.therapanacea.eu/">https://www.therapanacea.eu/</a>
Available?	Soon (within 3 years)
Product	AI tool to seamlessly overlap MRI and CT scans, to use for planning radiotherapy. Also offers an AI tool to automate contouring. Aims to reduce workload, as well as decrease errors and variation in planning.
Status	NR

# Care coordination

## Digital tools to assist in care coordination



Name	My mHealth HAYA Connected Cancer Care
Website	<a href="https://mymhealth.com/haya">https://mymhealth.com/haya</a>
Available?	Now
Product	App used by cancer patients to: record symptoms/observations, make documents before/during/after consultations, communicate with their clinical team via video chat, access educational resources, and create a concerns list to develop a personalized treatment plan. All information is also available on the clinicians' end.
Status	Available for use by any patient and clinical team.

# Care coordination

## Digital tools to assist in care coordination



Name	Careology
Website	<a href="https://www.careology.health/">https://www.careology.health/</a>
Available?	Now
Product	App used by cancer patients to: log appointments, symptoms, medication, and data from wearables. This can be shared with clinical teams, enabling early virtual intervention, and aiming to reduce hospitalizations. Also allows clinicians to conduct virtual ward rounds.
Status	Available now; endorsed by Macmillan Cancer Support.

# Care coordination

## Digital tools to assist in care coordination

Screening

Presentation

Diagnosis

Treatment

Post-Treatment

Name	TIYGA Health
Website	<a href="https://www.tiyga.health/">https://www.tiyga.health/</a>
Available?	Now
Product	App which allows patients to report details relevant to health and care to clinicians, enabling personalized care. Relatively simple, and not oncology-focused, but can be tailored to a patient's needs.
Status	Available now

# Care coordination

Screening

Diagnosis

Treatment

Post-Treatment

Presentation

## Digital tools to assist in care coordination

Name	BRIAN
Website	<a href="https://www.thebraintumourcharity.org/living-with-a-brain-tumour/brian/">https://www.thebraintumourcharity.org/living-with-a-brain-tumour/brian/</a>
Available?	Now
Product	Disease-specific app, freely available to patients with brain tumours. Contains appointment/medication reminders, as well as gamified tracking of cognitive performance, as a means of remotely monitoring for deterioration.
Status	Freely available now, supported by the Brain Tumour Charity.

**BRIAN** 



# Care coordination

## Digital tools to assist in care coordination



Name	Vine Health
Website	<a href="https://www.vinehealth.ai/">https://www.vinehealth.ai/</a>
Available?	Now
Product	Digital platform to capture patient-reported outcomes and quality of life, and detect adverse events, providing personalized patient support programmes and assisting clinical research. AI component aims to analyze this data as a means of predicting complications.
Status	CE marked and available in UK and Europe.

# Care Coordination



## ‘Hospital at Home’

- [Digitally enabled hospitals](#) at home can reduce hospital stays and emergency admissions in cancer patients.
- [A virtual oncology ward](#) has been trialled in Wales.

## AI tools to predict treatment response

- [An AI tool](#) can predict response to treatment in metastatic colorectal cancer, in a manner superior to monitoring tumour size.

# Care Coordination

## ‘Hospital at Home’

Screening

Diagnosis

Treatment

Post-Treatment

Presentation

Name	HUMA (Medopad digital platform)
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Website	<a href="https://huma.com/">https://huma.com/</a>
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Available?	Now
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Product	Mobile phone platform used to monitor health data in real-time, enabling management at home, and aiming to reduce hospitalization, and emergency attendances. AI component synthesizes health data into an ‘objective’ view of the patients’ status.
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Status	In use in 20 NHS trusts in 15 disease categories (without AI component). Being piloted in Cwm Taf Moragnnwg and Betsi Cadwaladr health boards.
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medopad



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