



Personalised cancer care

Toolkit for patient leaders

Core slide deck





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About this document

Why?	The presentation aims to demystify the topic of personalised cancer care, by proposing a shared definition and exploring the value that personalised care strategies can bring to cancer patients, their caregivers and broader healthcare systems
Who?	The content is aimed at patient advocacy groups and patient leaders to help them: <ul style="list-style-type: none">• Introduce personalised care to people living with cancer and other members of cancer communities• Inform and guide patient groups around advocacy and policy initiatives/activities related to personalised care
What?	The content provides a background on personalised cancer care and the impact that personalised strategies can have on cancer care, as well as current challenges and issues and how these can be overcome
How?	<p>This document can be downloaded, read and presented to, or shared with, audiences at meetings, individual briefings or used as part of discussions</p> <p>Note:</p> <ul style="list-style-type: none">• <i>References are included throughout within the slide notes</i>• <i>Definitions of key terms used throughout this document are provided on slide 6 and 7 – please see the Personalised cancer care: Guide to medical terms for a more comprehensive description of key terms</i>



Understanding personalised cancer care





Key terms and definitions (1/2)

Term	Definition
Biomarker	Molecules found in cells (e.g. genes) that provide important information about a person's cancer. New biomarkers for different cancer types are constantly being discovered. ^{1,2} <i>Also called genetic information, molecular marker, oncogene and tumour marker.</i>
Comprehensive genomic profiling	A next-generation sequencing test that can detect multiple biomarkers at the same time. It can provide important information that can help guide decisions about treatments for patients across all cancer types. ^{3,4} <i>Also called CGP.</i>
Gene	A part of DNA that contains important information for the development of certain components in a cell (e.g. proteins). ⁵
Genetic testing	A test that looks at certain genes to identify genetic differences or susceptibility to particular diseases (such as cancer) or abnormalities. ^{5,6}
Genomic testing	A test that looks at multiple genes at the same time, from a sample of a person's saliva, cells or blood. It can identify some biomarkers in cancer cells. ^{5,7-9} <i>Also called biomarker testing, genomic profiling, molecular testing, somatic testing, tumour genetic testing, tumour profiling, tumour subtyping and tumour testing.</i>
Germline mutation	A genetic change in a sperm or egg. When they come together to form a fertilised egg, the genetic change is passed on to the offspring. Cancer caused by germline mutations is called inherited cancer. ¹⁰



Key terms and definitions (2/2)

Term	Definition
Immunohistochemistry	A laboratory test that uses antibodies (immune proteins) to identify certain biomarkers (known as antigens) in a sample of tissue. ¹¹
Immunotherapy	A treatment that uses the body's own immune system to prevent, control and eliminate cancer. Examples of immunotherapy include immune checkpoint inhibitors and cancer vaccines. ^{12,13} <i>Also called Immunology.</i>
Liquid biopsy	A new and non-invasive biopsy that analyses different components of the cancer from a sample of bodily fluids, such as blood. These cells may then be tested for biomarkers. ¹⁴
Next-generation sequencing	An advanced laboratory method that captures a large amount of genetic information from a single sample. Comprehensive genomic profiling is an example of a next-generation sequencing test. ^{3,4,15} <i>Also called NGS.</i>
Targeted treatment	A type of treatment that targets specific types of cancer cells with fewer effects on healthy cells. They are often directed at biomarkers that contribute to the growth, spread and survival of cancer cells. ^{16,17} <i>Also called targeted therapy.</i>
Tumour-agnostic treatments	A new approach to cancer care that is based on the cancer's genetic information, which cause the cancer to develop and grow. These treatments may be used across a range of cancer types, regardless of where in the body the cancer started. ^{18,19} <i>Also called pan-tumour therapy, pan-tumour treatment, tumour-agnostic therapy tumour-independent therapy and tumour-independent treatment.</i>



What is personalised cancer care?

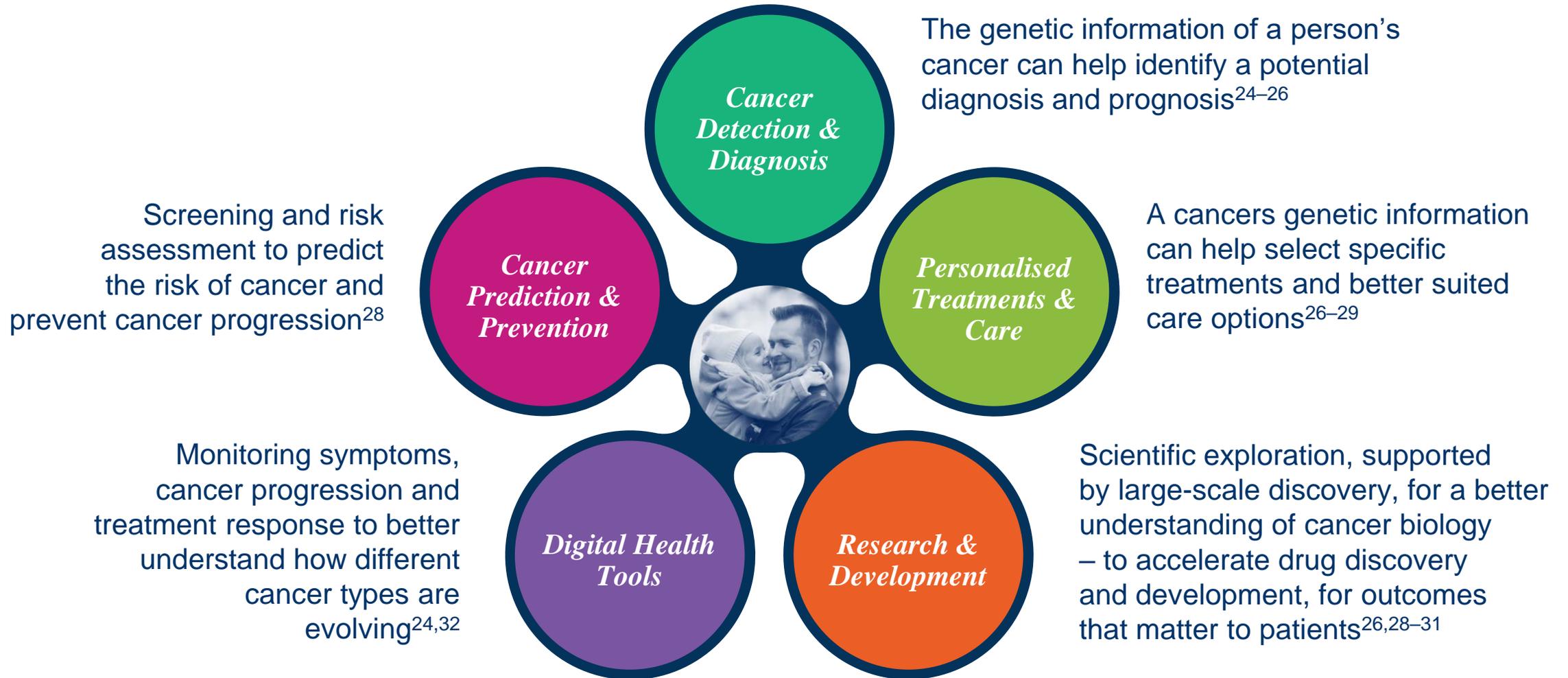
*An approach based on a person's **unique health needs**, including the genetic information (known as biomarkers) of their cancer, as well as their lifestyle and environment^{2,20}*

*An **evolving field**, gradually moving away from a traditional approach to cancer care toward a targeted, tailored approach^{2,21-23}*

*Its aim is to find **prevention and treatment strategies tailored** to each individual patient, to successfully treat their specific cancer and prevent relapse²⁴*



Potential applications of personalised cancer care





How can personalised care transform cancer?

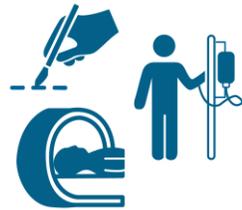


Advances in cancer diagnostics have paved the way for personalised care



Advances in diagnostic tools and technologies have transformed cancer care from a traditional “one size fits all” approach to a precision approach – this marks a important step towards personalised care, but there is still a way to go...^{2,22,27,33}

Diagnostic and scientific advances, including completion of the Human Genome Project in 2013, and new genetic technology^{2,34}



Past: Traditional approach

Treating everyone with the same type and stage of cancer with the same type of treatment, using traditional treatments (chemotherapy and radiation and/or surgery)^{2,35}



Present: Precision approach

Using cutting-edge technology (e.g. comprehensive genomic profiling tests) to accurately diagnose cancer and tailor treatment (targeted treatments, immunotherapy)^{21,27,36}



Future: Personalised approach

Tailoring care for every person’s unique cancer, taking into account the cancers genetic information and the person’s lifestyle and environment, from diagnosis to disease and treatment monitoring – providing the ‘right treatment to the right person at the right time’²

Understanding biomarker testing

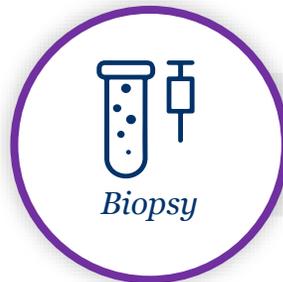


New technology means doctors can test for specific genetic information in cancer cells known as biomarkers³⁷

*Biomarkers are molecules (e.g. genes) that indicate normal or abnormal processes in the body – testing for them can provide **essential information** about each person's cancer¹*

Biomarker testing is different from genetic testing, which identifies an individual's inherited risk to cancer through genetic changes called germline mutations⁶

Biomarker testing process:



Biopsy

Solid tissue biopsy⁹

Liquid biopsy

A new, non-invasive approach that examines fluids (e.g. blood)^{9,38}



Lab analysis

Single biomarker tests

Detect one biomarker⁹

Comprehensive genomic profiling

Detects multiple biomarkers with a single test^{3,4}



Biomarker testing: the driver of personalised care in cancer

Testing to detect and measure these biomarkers may help inform and personalise care across the patient pathway:

		Cancer prediction and prevention		Cancer detection and diagnosis		Personalised treatments and care	
		Risk assessment	Screening/detection	Diagnosis	Prognosis	Prediction	Monitoring
Potential applications		Estimate risk of developing cancer ^{1,24}	Indicate presence of cancer; early detection ²⁵	Definitive diagnosis and tumour typing ^{9,24}	Assess cancer aggressiveness and likelihood of recurrence ^{1,24}	Predict effectiveness or response to treatments ^{1,24}	Monitor for cancer recurrence/progression and response to treatment ²⁴
Biomarker examples		BRCA1 germline mutation (breast and ovarian cancer) ^{1,24}	Prostate specific antigen (prostate cancer) ^{24,25}	Immuno-histochemistry to determine tissue of origin ²⁴	21 gene recurrence score (breast cancer) ²⁴	KRAS mutation and anti-EGFR treatment (colorectal and lung cancer) ^{24,39}	CA15-3 (breast cancer) ²⁴ CEA (colorectal cancer) ²⁴



R&D: The wider application of personalised cancer care

Personalised care doesn't just benefit individual patients^{28,40}

Personalised care can help the wider patient community, by accelerating **research and development** in cancer,^{28,40} through:

Collecting **large amounts of data** from clinical trials and real-world settings⁴⁰



Development of **genomic/molecular technologies**^{28,41}



Which can result in:

Biomarker testing for patient selection and stratification^{28,41}



A better understanding of every cancer
Providing a complete and detailed picture of every cancer to allow research into targeted treatments^{28,30,31,42}

More effective clinical trials
Improving patient selection methods which can lead to more effective results^{28,30}

More efficient clinical trials
Identifying specific patient populations for smaller, more streamlined trials, which can also reduce costs and high rates of failure^{28,30}



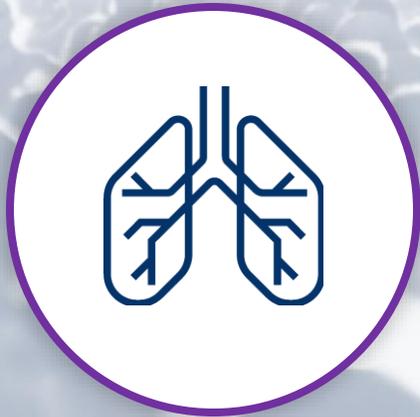
How is personalised care becoming a reality?





Personalised cancer care in practice

Personalised care is already being practiced...



*Personalised care is commonly part of the routine care of advanced **lung cancer**^{39,43}*

...and offers promise for other cancers, which otherwise may be difficult to diagnose or treat



*Personalised care may be used to manage **cancer of unknown primary (CUP)**^{44,45}*



***Tumour-agnostic treatments** are a new approach which are beginning to show promise in clinical settings across a range of **rare and hard to treat cancers**^{18,19,46}*



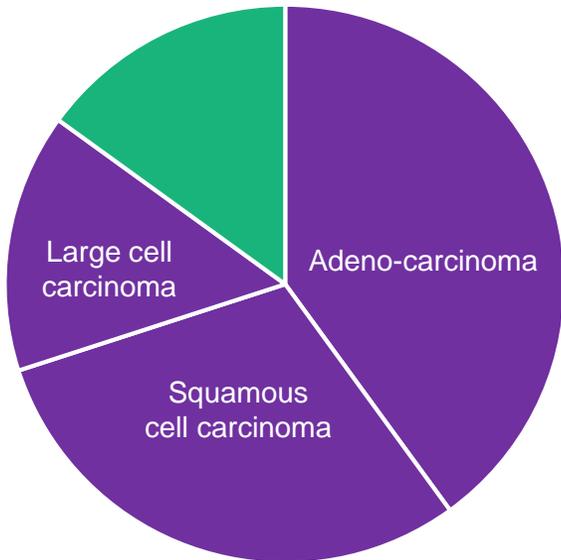
Lung cancer: biomarker testing for personalised care

Lung cancer is not a single disease – lung cancer is a good candidate for personalised care due to its well-characterised subtypes and biomarkers^{39,47}

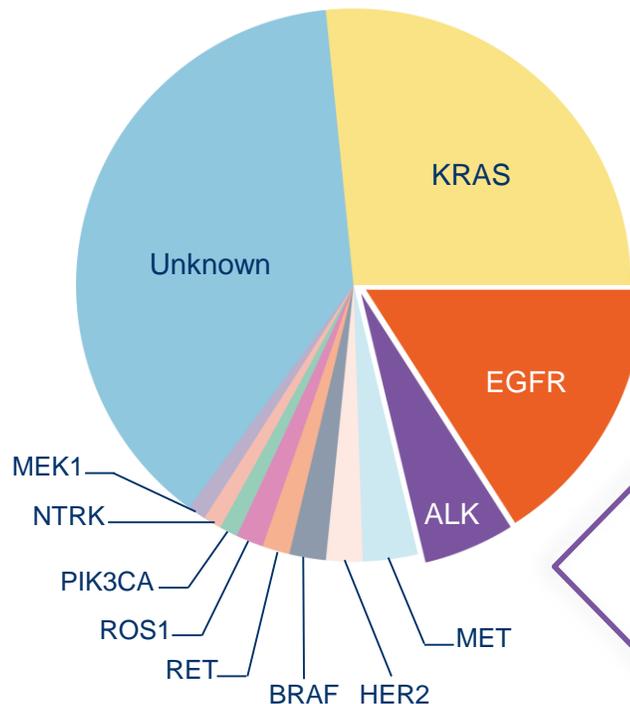
Two major histological subtypes:⁴⁷

Small cell lung cancer (SCLC)
15%

Non-small cell lung cancer (NSCLC)
85%



In NSCLC, specific biomarkers have been identified:⁴⁸⁻⁵³



EGFR and **ALK** have been validated as biomarkers that predict good response to specific treatments³⁹

Understanding the subtype and biomarkers for each person's lung cancer gives doctors vital information to diagnose and prescribe a treatment path that suits them⁴



Lung cancer: testing can guide treatment decisions

Understanding the processes of lung cancer at a genetic level has enabled the development of treatments that are both **more effective** and **better tolerated**^{39,47}

Biomarkers provide invaluable information

Testing can identify specific biomarkers that can be targeted by certain treatments^{39,54}

e.g. Cancers with the EGFR biomarker respond well to EGFR tyrosine kinase inhibitors and cancers that have the ALK biomarker respond well to ALK inhibitors³⁹

Identifying biomarkers can determine the effectiveness of immunotherapy³⁹

e.g. Cancers with high levels of PD-1 receptors respond well to immune checkpoint inhibitors (a class of immunotherapies)³⁹

Improved outcomes

For patients whose cancer harbours a particular biomarker, targeted treatments and immunotherapies can be more effective and have less side effects than traditional cancer treatments (e.g. chemotherapy)^{39,47,54,55}



Cancer of unknown primary: the role of testing

Cancer of unknown primary (CUP) is a **poorly understood** type of cancer where doctors **cannot find where in the body** the cancer started (the primary site)^{56,57}

CUP has significant unmet need

Not knowing the original location makes treatment extremely difficult^{57,58}

Treatment is often limited to chemotherapy, which is often ineffective^{56,58}

Median overall survival is only around one year^{56,57}

Personalised care to manage CUP

Gene expression profiling tests have the potential to **identify the primary site** – to help guide treatment decisions based on **where the cancer started**^{56–59}

- There are already some gene expression tests that may predict the primary site in up to 80% of CUP cases^{56–58,60}
- Although promising, there is currently a lack of evidence showing the clinical benefit of this approach^{56–59,61}

Comprehensive genomic profiling tests have the potential to **identify biomarkers** that can be targeted by existing treatments – to help guide treatment decisions based on **any identified biomarkers**^{45,62,63}



Tumour-agnostic treatments: an important step in personalised care

Tumour-agnostic treatments

are a new approach to cancer care based on the cancer's genetic information, which cause the cancer to develop and grow, regardless of where in the body it started¹⁸

Testing for biomarkers is therefore an important part of making decisions about treatment^{18,64}

Tumour-agnostic treatments are a quite new concept, but an increasing number are being approved for use in some cancers^{18,19,64}

Other potential tumour-agnostic treatments are being studied in clinical trials, which could be available soon⁶⁵



What is the value of personalised care in cancer?



Who may be impacted by personalised care?²⁸



*People at an
increased risk
of cancer*



*People living
with
cancer*



*Loved
ones*



*Healthcare
professionals*



Researchers



Society

Everyone!



Potential benefits of personalised care in cancer



Improved **health outcomes** due to more accurate and more personalised detection, diagnosis and treatment of cancer^{22,28,66}



Empowered people with cancer and families through managing potential health risks and disease knowledge^{28,66}



Improved **quality of life** for people with cancer and families^{22,28}



Potential lower **financial impact** and reduced time off work²⁸



Promoting health and wellbeing of **society** and better use of healthcare resources²⁸



How does this affect us?



Current landscape for personalised cancer care



Personalised care is high on the agenda across healthcare systems, mainly in the EU, US and UK...⁶⁷⁻⁷⁰

...But for many countries, putting personalised care into practice will require a **fundamental change in how care is delivered and managed**^{70,71}



Policy	<p>Recent EU reports '<u>Europe's Beating Cancer Plan</u>' and '<u>Conquering Cancer: Mission Possible</u>' focus on expanding personalised care to treat cancer^{67,68}</p>	<p>2019 PMC report notes the significant progress of personalised tests and treatments for cancer, but stated that policies must encourage further advancements⁶⁹</p>	<p>NHS England's 2019 <u>long term plan</u> focuses on personalised care to ensure everyone living with cancer gets the right support when they need it⁷⁰</p>
Science/R&D	<p>Routine next-generation sequencing was recently recommended by ESMO for metastatic non-small-cell lung cancer, cholangiocarcinoma, prostate cancer and ovarian cancer⁷²</p>	<p>~50% of products in late-stage development in US biopharma's are targeted treatments⁷³</p> <p>2 liquid biopsy assays were approved by the FDA in 2020⁷⁴</p>	<p>NHS launched the <u>Genomics Medicine Service</u>, which aims to deliver routine clinical care for people with certain forms of cancer⁷⁵</p>

Where do we go from here?



Transitioning from the traditional approach to personalised care is an immense task that presents multiple challenges, but patient groups can play a key role in overcoming these barriers:

Challenges

Call to action

Many targeted treatments are expensive and may be unaffordable for many countries^{2,76,77}

Personalised treatments and diagnostic tools are not always available for every person with cancer²

Use of patient data can cause concerns over consent^{66,78}

Biomarker testing is still not very well known or widely talked about⁷⁹

Overhyping of personalised strategies can lead to false hopes, fears and high expectations among people with cancer^{2,78}

Testing may reveal incidental findings, including genes that make people susceptible to other diseases²³

Lobby to improve access to diagnostic tests and suitable treatments

Promote ethical and legal frameworks that protect privacy, control how information is used and maintain greater transparency over health data use

Raise awareness of the latest personalised care advances among the cancer community, to improve health literacy and foster dialogue between people with cancer and HCPs

Educate HCPs and equip them with the tools to better understand and address people's expectations and fears around outcomes

Promote and support efforts in research, including helping gather comprehensive information on specific cancer types

Communicate with people with cancer to provide a realistic picture of what personalised care can offer

Support the development of ethical and legal frameworks and establish counselling recommendations on disclosing test results



Thank you





Appendix



Helpful resources

Here we provide a comprehensive list of supporting assets and additional resources that provide more information on personalised care in cancer for patient leaders and the cancer community:

- [Cancer Biomarkers Infographic](#) – European Cancer Patient Coalition (ECPC)
- [Cancer of Unknown Primary and the role of cancer genomic testing](#) – Roche
- [Impact of New Personalised Cancer Treatments](#) – Macmillan Cancer Support
- [Improving Outcomes Through Personalised Medicine](#) – NHS England
- [Infographic: Testing for EGFR mutations in non-small cell lung cancer](#) – Roche
- [Personalised Medicine Leaflet](#) – ECPC
- [Personalised Medicine Booklet](#) – ECPC
- [Personalised Cancer Medicine Guide for Patients](#) – European Society for Medical Oncology (ESMO)
- [The Personalized Medicine Report](#) – The Personalized Medicine Coalition (PMC)
- [The science behind innovations in personalised cancer care: spotlight on comprehensive genomic profiling](#) – Roche

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