This document is for use by trained and qualified UK healthcare professionals only.

Guide for *BRCA* testing in prostate cancer

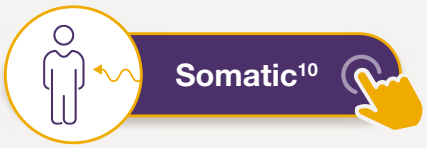
LYNPARZA (olaparib) is indicated as monotherapy for the treatment of adult patients with metastatic castration-resistant prostate cancer and *BRCA1*- and/or *BRCA2*-mutations (germline and/or somatic) who have progressed following prior therapy that included a new hormonal agent.[1,2]

Adverse events should be reported. Reporting forms and information can be found at www.mhra.gov.uk/yellowcard. Adverse events should also be reported to AstraZeneca on 0800 783 0033 and via contactazmedical@astrazeneca.com.

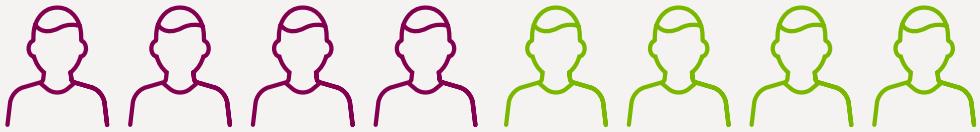
For a full list of adverse events (AEs), please refer to the SmPCs here.
Click on the following links to view the Prescribing Information (GB) or Prescribing Information (NI) for LYNPARZA® (olaparib): Great Britain; Northern Ireland.

BRCA mutations are reported in approximately 1 in 10 patients with prostate cancer[3–7] and can cause increased sensitivity to PARP inhibition[8]

- Mutations in *BRCA* genes can be:[4]



- Of all *BRCA* mutations in prostate cancer, approximately half are **germline** and half are **somatic**[4]



What are *BRCA1* and *BRCA2* genes?
Both genes encode proteins involved in repairing DNA double-strand breaks via the homologous recombination pathway[8,11]

- Prostate cancer driven by *BRCA* mutations is associated with **aggressive disease**[6,7]

LYNPARZA MoA

- *BRCA* mutations can result in **homologous recombination deficiency**,[8,12] and such defects in cells can make them highly **sensitive to PARP inhibitors,** such as LYNPARZA[8]
- LYNPARZA is indicated as monotherapy for patients with **metastatic castration-resistant prostate cancer (mCRPC)** and ***BRCA1*- and/or *BRCA2*-mutations (germline and/or somatic)** who have progressed following prior therapy that included a new hormonal agent[1]

Why should I test my patients for *BRCA* mutations?

To inform **prognosis**[6,7]

To assess **familial risk**[14,15]

To determine eligibility for **clinical trials**[3,5]

To determine eligibility for **treatment with LYNPARZA monotherapy***[1]

*Patients must have a somatic and/or germline *BRCA1* and/or *BRCA2* mutation-positive test result to be eligible for treatment with LYNPARZA (privately or in reimbursed countries).[1]

How do I test my patients for *BRCA* mutations?

Tumour tissue testing

Blood germline testing

ctDNA testing

- Tumour tissue testing is the established method for identifying germline and somatic mutations in prostate cancer. ctDNA, where available, is an alternative.[15–19] Genomic testing should be conducted by an experienced laboratory using a validated test[1]

When and how do I organise a tumour tissue test for my NHS patient?

Consider testing patients with prostate cancer at diagnosis of metastatic disease

- Testing services are available at your local GLH (in England only)[23] or your designated laboratory service for genomic testing (Wales, Scotland and Northern Ireland):[24–28]
  - **England:** For requests via your local GLH, somatic tumour tissue testing is listed in the National Genomic Test Directory as 'M218.1' or 'Multi-target NGS panel – small variant (*BRCA1, BRCA2*). Germline testing for *BRCA1* or *BRCA2* is listed as 'R444.2' in the NHS Testing Criteria for Rare and Inherited Disease.[†29,30] Additionally, genomic testing for inherited prostate cancer is now listed in the NHS Genomic test directory under codes R430.1 and R430.2 (*BRCA1, BRCA2, MLH1, MSH2, MSH6, ATM, PALB2, CHEK2*).[30] NHS England has produced a genomics education website, GeNotes, to support clinicians with their genomic decision making[31]

National Genomic Test Directory (England)

NHS England GeNotes

  - **Scotland, Wales and Northern Ireland:** Availability of genomic testing in Scotland, Wales and Northern Ireland varies according to the type of test required and cancer indication. Please click on the links below and contact your designated laboratory service for further guidance:

Scottish Genetics Laboratory Consortium

All Wales Medical Genomics Service

Regional Diagnostics Service (Northern Ireland)

†Patients should be eligible for LYNPARZA and have a diagnosis of mCRPC. Somatic testing should be performed first. Germline testing should only be performed if there is insufficient tissue or the somatic testing failed.[29]

When and how do I organise a tumour tissue test for my private patient?

- Testing varies depending on location and insurer
- Contact the insurer and explain the potential reason(s) for testing to establish whether they will cover the cost
- Consider contacting your local GLH or designated laboratory service to find out if they offer tumour tissue testing for patients with private healthcare insurance – knowing your patient's NHS number may be helpful
- Tumour tissue testing is also available with independent vendors

Where is my local GLH or designated laboratory service?

Find your local GLH or designated laboratory service

What key steps do I need to be aware of when organising a tumour tissue test?

Use the checklist below:[32,33]

- Contact your local GLH, designated laboratory service or independent vendor to gather all relevant information
- Check the reason for *BRCA* testing and patient eligibility
- Check requirements for sample collection and preparation (see local guidance)
- Complete the request form provided by your local GLH, designated laboratory service or independent vendor
- Label the sample correctly
- Send the sample (with any additional documents if needed)

Summary

Genomic testing is available for prostate cancer[‡29]

Tumour tissue testing is a widely available and established method to test for germline and somatic mutations[15,16]

BRCA1
BRCA2

Testing for *BRCA* mutations may identify patients who are eligible for treatment with LYNPARZA monotherapy[§1]

For more information on ordering a tumour tissue test and sending patients' samples for testing, contact your local GLH, designated laboratory service or independent vendor

Please check the National Genomic Test Directory for any updates on the availability of these tests in England. Please contact your local designated laboratory service for more information if you are practising in Scotland, Wales or Northern Ireland

‡Not currently funded in Scotland and not currently available in Northern Ireland. Subject to change in the future. Information is accurate at the time of infographic development: August 2023; §Privately or in reimbursed countries.

LYNPARZA (olaparib) is also indicated in combination with abiraterone and prednisone or prednisolone for the treatment of adult patients with mCRPC in whom chemotherapy is not clinically indicated. No testing is required for this indication.[1,2] LYNPARZA is not reimbursed for this indication in the UK

Information is accurate at the time of infographic development: August 2023.

AE, adverse event; ctDNA, circulating tumour DNA; GLH, genomic laboratory hub; mCRPC, metastatic castration-resistant prostate cancer; MoA, mode of action; NGS, next-generation sequencing; NHS, National Health Service; PARP, poly-ADP ribose polymerase.

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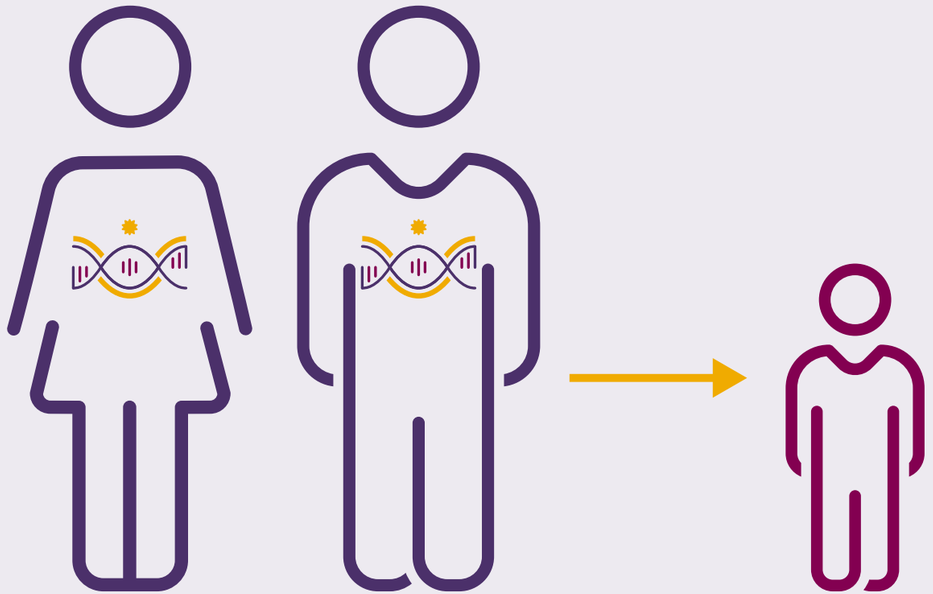
MSD

AstraZeneca

Germline



Mutations are inherited and present from birth[9]

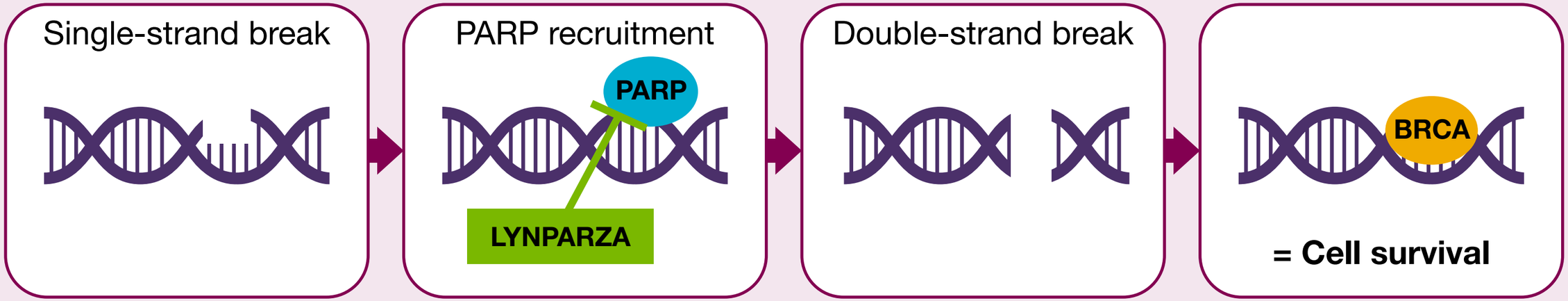
Somatic

not inherited

Mutations develop in non-germ cells after birth and are not passed on to offspring[10]

LYNPARZA MoA[8,12,13]

Normal cell:



Tumour cell with *BRCA1* and/or *BRCA2* mutation:

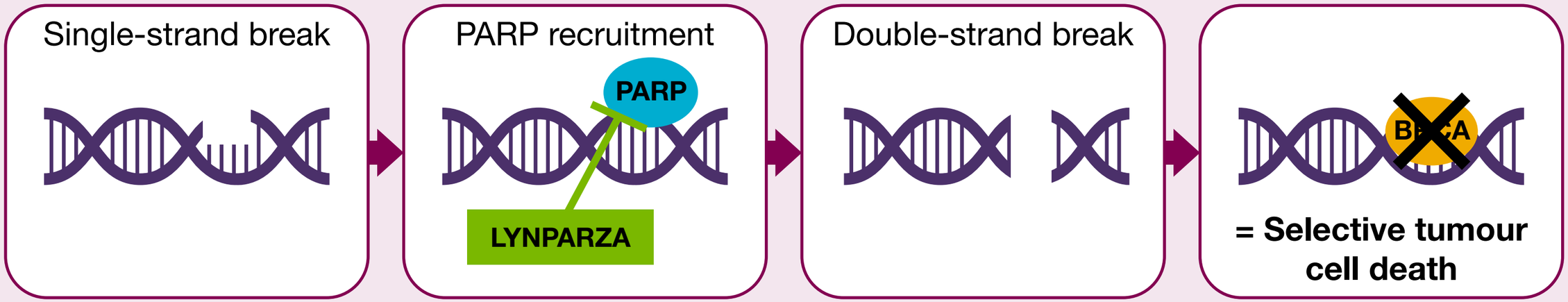


Figure adapted from Cerrato A, et al. *J Exp Clin Cancer Res* 2016.[13]

Tumour tissue testing

- Identifies germline and somatic mutations, but does not distinguish between them; blood germline testing can be used to confirm this[16]
- Fresh and archival tissue can be used[17]
- Primary or metastatic tumour tissue can be used[17]

ctDNA testing

- Identifies germline and somatic mutations, but does not distinguish between them; blood germline testing can be used to confirm this[16,18,19]
- Clinical trials are exploring the use of ctDNA as a type of liquid biopsy in prostate cancer[20]
- Outside of clinical trials there is currently limited use of ctDNA as a method of identifying mutations in prostate cancer[20]
- If tumour tissue testing fails or is not feasible, if available, ctDNA testing could be used to identify patients with a *BRCA* mutation in mCRPC who may derive benefit from LYNPARZA monotherapy treatment[21]

Blood germline testing

- Identifies germline mutations, but not somatic mutations, from DNA present in a blood sample[16,22]
- Confirms if the mutation is an inheritable germline mutation confering familial risk[15]

- The NHS Scotland genetics services are delivered through the Scottish Genetics Laboratory Consortium (SGLC). The SGLC comprises four regional genetics centres in Aberdeen, Dundee, Edinburgh and Glasgow[24–26]
- *BRCA* testing services currently being offered by the **Glasgow** and **Aberdeen** centres:
  - **West of Scotland Genetics Service (Glasgow)** https://www.nhsggc.scot/staff-recruitment/staff-resources/laboratory-medicine/laboratory-genetics/
  - **North of Scotland Genetics Service (Aberdeen)** https://www.nhsgrampian.org/service-hub/north-of-scotland-medical-genetics/

- In Wales, there is one genomic testing NHS service that delivers *BRCA* testing:[27]
  - **All Wales Medical Genomics Service**
    https://medicalgenomicswales.co.uk/

- In Northern Ireland, there is one genomic testing NHS service that delivers *BRCA* testing:[28]
  - **Regional Genetics Service**
    https://belfasttrust.hscni.net/service/laboratory-services/clinical-genetics/

- North East and Yorkshire[33]
  - **North East and Yorkshire Genomic Laboratory Hub**
    https://www.leedsth.nhs.uk/a-z-of-services/the-leeds-genetics-laboratory/

- North West[34]
  - **North West Genomic Laboratory Hub**
    https://mft.nhs.uk/nwglh/

- Central and South[35]
  - **West Midlands Regional Genetics Laboratory**
    https://bwc.nhs.uk/west-midlands-regional-genetics-laboratory

- East[36]
  - **East Genomic Laboratory Hub**
    https://www.eastgenomics.nhs.uk/about-us/genomic-laboratory-hub/

- North Thames[37]
  - **North Thames Genomic Laboratory Hub**
    https://www.norththamesglh.nhs.uk/

- South East[38]
  - **South East Genomics**
    https://southeastgenomics.nhs.uk/

- South West[32]
  - **South West Genomic Laboratory Hub**
    https://www.nbt.nhs.uk/south-west-genomic-laboratory-hub