CONDITION

Her2-positive breast cancer

HER2-positive breast cancer has high levels of a protein that helps cancer cells grow.

WHAT IT IS
Breast cancer driven by excess HER2 protein

BODY SYSTEM
Breasts and nearby lymph nodes, sometimes other organs

MAIN SYMPTOMS
Breast lump, skin changes, nipple changes, swollen armpit nodes

WHAT CAUSES IT
Acquired cancer-cell changes; exact trigger usually unknown

HOW IT IS DIAGNOSED
Biopsy with HER2 immunohistochemistry and in-situ hybridisation

MAIN TREATMENT
HER2-targeted therapy, often with surgery and chemotherapy

CAN IT BE CURED?
Sometimes - early-stage cancer may be eliminated

IS IT AN EMERGENCY?
Sometimes - severe breathlessness, chest pain, or stroke signs

LONG-TERM OUTLOOK
Early disease may be cured; advanced disease usually controlled, not cured

Overview

HER2-positive breast cancer is a type of breast cancer with unusually high levels of HER2. HER2 stands for human epidermal growth factor receptor 2. It is a protein on the surface of cells that helps control growth.

In HER2-positive cancer, cells usually have extra copies of the HER2 gene. This produces too much HER2 protein and sends strong growth signals to the cancer cells.

HER2-positive breast cancer can grow more quickly than some other breast cancers. However, treatments that specifically block HER2 have greatly changed how it is managed. These are called targeted therapies because they focus on a feature of the cancer cells.

HER2 status is separate from the cancer's stage. Stage describes the cancer's size and whether it has reached lymph nodes or other organs. A HER2-positive cancer may be found at

an early stage, when treatment aims to cure it, or at an advanced stage, when treatment usually aims for long-term control.

Symptoms

HER2-positive breast cancer does not usually cause symptoms that distinguish it from other types of breast cancer. Some cancers are found through breast screening before they cause any symptoms.

Possible changes include:

Breast pain can occur, but pain alone is not a reliable sign of cancer. Most breast lumps and breast changes are not cancer. Even so, a new or persistent change should be assessed rather than watched indefinitely.

If cancer has spread to another part of the body, symptoms depend on where it is. Examples include ongoing bone pain, unexplained breathlessness, abdominal swelling, or neurological symptoms such as weakness. These symptoms also have many non-cancer causes.

- A new lump or firm area in the breast or armpit
- A change in breast size, shape, or skin texture
- A nipple turning inward or producing unexpected discharge
- Redness, swelling, dimpling, or thickened breast skin

Causes and risk factors

HER2-positive breast cancer develops when breast cells acquire changes that disrupt normal growth. The HER2 gene is amplified, meaning that cancer cells contain extra copies of it. The reason this happens is usually unknown.

HER2 amplification is generally acquired by the cancer cells. It is not usually a gene change that you were born with or can pass to children.

Some people with breast cancer do have an inherited cancer-risk gene, such as a change in BRCA1, BRCA2, or another gene. This is a separate issue from the cancer being HER2-positive. Your age at diagnosis, family history, ancestry, and other cancers may be used to decide whether genetic counselling or testing is appropriate.

General breast cancer risk factors include increasing age, certain inherited gene changes, previous chest radiation, alcohol, and longer lifetime exposure to reproductive hormones.

Having one or more risk factors does not mean that you will develop breast cancer. Many people diagnosed with it have no clear preventable cause.

Diagnosis

A breast assessment may include an examination, a mammogram, an ultrasound, or sometimes an MRI scan. Imaging can show a suspicious area, but it cannot confirm HER2-positive breast cancer on its own.

Confirmation requires a biopsy. During a biopsy, a small sample of tissue is removed and examined in a laboratory. The pathologist confirms whether cancer is present and reports features that help guide treatment.

HER2 is usually assessed with one or both of these tests:

An IHC score of 3+ is considered HER2-positive. A score of 2+ needs an ISH test to clarify the result. Testing and reporting follow detailed laboratory standards because an accurate result affects treatment.

The sample is also tested for oestrogen and progesterone receptors. A cancer can be both HER2-positive and hormone receptor-positive.

Further scans and lymph-node tests help establish the stage. If cancer returns or spreads, another biopsy may be advised when practical because HER2 and hormone receptor results can change over time.

- Immunohistochemistry , or IHC, measures how much HER2 protein is present on the cells
- In-situ hybridisation , or ISH, looks for extra copies of the HER2 gene

Treatment and management

Treatment is based on the stage, tumour size, lymph-node involvement, hormone receptor results, previous treatment, general health, and personal priorities. A specialist breast cancer team usually combines several types of treatment.

For early HER2-positive breast cancer, treatment may begin with surgery or with medicines given before surgery. Treatment before surgery is called neoadjuvant therapy. It can shrink the cancer and show how strongly it responds.

HER2-targeted medicines include antibodies such as trastuzumab and pertuzumab. They attach to HER2 or interfere with its signals. They are often combined with chemotherapy because the treatments can work better together.

After neoadjuvant treatment, surgery removes the remaining tumour. A lumpectomy removes the cancer with a rim of surrounding tissue. A mastectomy removes the breast. Lymph nodes may also be sampled or removed.

Treatment after surgery is called adjuvant therapy. Its purpose is to destroy cancer cells that may remain but are too small to detect. The choice may be influenced by whether any invasive cancer remained at surgery. Radiation therapy is commonly used after a lumpectomy and in selected situations after a mastectomy.

If the cancer also has hormone receptors, hormone-blocking treatment may reduce the chance of it returning. This is separate from HER2-targeted treatment.

For cancer that has spread to distant organs, treatment usually involves a sequence of HER2-targeted medicines. Options include antibodies, antibody-drug conjugates that carry chemotherapy into HER2-expressing cells, and tablets that block HER2-related enzymes. Treatment is adjusted according to previous therapy, side effects, response, and where the cancer has spread.

Some HER2 treatments can affect heart function. Heart scans are often performed before and during treatment. Certain antibody-drug conjugates can cause inflammation of the lungs, so a new cough or breathlessness needs prompt assessment. Other possible effects include fatigue, diarrhoea, nausea, low blood counts, numbness, hair loss, and infusion reactions. The exact pattern depends on the medicines used.

Supportive care can help with symptoms, treatment effects, sleep, emotional health, fertility concerns, and practical problems. It can be provided alongside treatment at any stage.

Complications

HER2-positive breast cancer may return in the breast, nearby tissues, or another organ. The likelihood is influenced by the original stage, lymph-node involvement, hormone receptor status, and response to treatment.

Advanced cancer may affect bones, lungs, liver, or brain. Treatment can often shrink or stabilise these areas, but advanced breast cancer is usually not considered curable.

Possible longer-term effects of treatment include lymphoedema, which is swelling caused by disrupted lymph drainage, as well as nerve symptoms, early menopause, fertility changes, heart problems, or persistent fatigue. Not everyone develops these problems.

Report side effects early. Adjusting treatment or providing supportive care may prevent a manageable problem from becoming more severe.

Prevention

There is no proven way to prevent a breast cancer from becoming HER2-positive. The HER2 change usually develops within the cancer cells and is not caused by something you did.

General steps that may lower overall breast cancer risk include limiting alcohol, maintaining regular physical activity, and discussing the risks and benefits of menopausal hormone therapy when relevant. These steps cannot guarantee prevention.

Breast screening does not prevent cancer, but it may find it before symptoms develop. Screening schedules differ by age, location, and personal risk.

People with a strong family history or an inherited cancer-risk gene may be offered extra screening or risk-reducing options. These measures address overall breast cancer risk, not HER2 status specifically.

Living with it and what to expect

Early-stage treatment often unfolds over many months. It may include medicine before surgery, surgery, radiation, and continued targeted or hormone therapy. Recovery is rarely a straight line. Energy, appetite, sleep, and concentration may improve gradually and can fluctuate between treatments.

Follow-up after early treatment usually includes scheduled appointments and breast imaging when appropriate. Routine whole-body scans are not always used when there are no symptoms. Follow-up also addresses treatment effects, emotional wellbeing, bone and heart health when relevant, and any new breast changes.

Some people return quickly to work and usual activities. Others need a phased return or lasting adjustments. Exercise adapted to your ability can help some people with fatigue and physical recovery, but rest is also part of recovery.

If cancer is advanced, treatment commonly continues for as long as it is helping and side effects remain acceptable. Scans and symptoms are reviewed at intervals. A treatment may work for a period and then need to be changed. Some people live for years with controlled HER2-positive breast cancer, but individual outcomes cannot be predicted with certainty.

Fear of recurrence is common, especially around appointments or new symptoms. Support from a cancer nurse, counsellor, peer group, or palliative care team can help. Palliative care is not limited to the end of life; it also treats symptoms and supports quality of life during active cancer treatment.

When to get medical help

Arrange a routine medical assessment for a new breast lump, nipple change, skin change, or persistent swelling in the breast or armpit. Do not wait for routine screening if you notice a new symptom.

During treatment, contact your cancer team promptly about fever or signs of infection, repeated vomiting, severe diarrhoea, worsening pain, dehydration, or side effects that stop you eating, drinking, sleeping, or completing normal activities.

A new or worsening cough or breathlessness during HER2-targeted treatment needs urgent assessment because it could reflect lung inflammation, infection, a blood clot, or another problem.

Seek emergency help for:

These symptoms do not always mean the cancer has worsened, but they should not wait for a routine appointment.

- Severe difficulty breathing, chest pain, fainting, or blue-grey lips
- Sudden facial drooping, one-sided weakness, speech difficulty, or confusion
- A seizure, loss of consciousness, or a sudden severe headache
- Rapid swelling of the face or throat after treatment
- Heavy bleeding that does not stop

Common questions

Is HER2-positive breast cancer more aggressive?

Without targeted treatment, it can grow and spread more quickly than some other breast cancers. HER2-targeted medicines have substantially improved treatment outcomes. Stage and response to treatment remain important.

Is HER2-positive breast cancer inherited?

Usually not. HER2 amplification normally occurs only inside the cancer cells. A separate inherited gene change may still affect overall breast cancer risk, which is why genetic assessment is sometimes offered.

Will I need chemotherapy?

Chemotherapy is often combined with HER2-targeted treatment, especially for larger, lymph-node-positive, or advanced cancers. Some small early cancers may be managed

differently. The balance of benefit and side effects is assessed for each situation.

Can HER2-positive breast cancer come back?

It can recur, although treatment lowers that risk. The chance is shaped by the cancer's stage, lymph nodes, hormone receptors, and response to treatment. A new symptom does not automatically mean recurrence.

Can HER2 status change?

Yes. A recurrence can have a different HER2 or hormone receptor result from the original cancer. When possible, testing a new tumour sample helps guide further treatment.

Can stage 4 HER2-positive breast cancer be cured?

Stage 4 means the cancer has reached a distant organ. It is usually not considered curable, but modern treatments may control it for meaningful periods. Treatment aims to extend life while protecting comfort and daily function.

Sources

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