# Metastatic bone disease

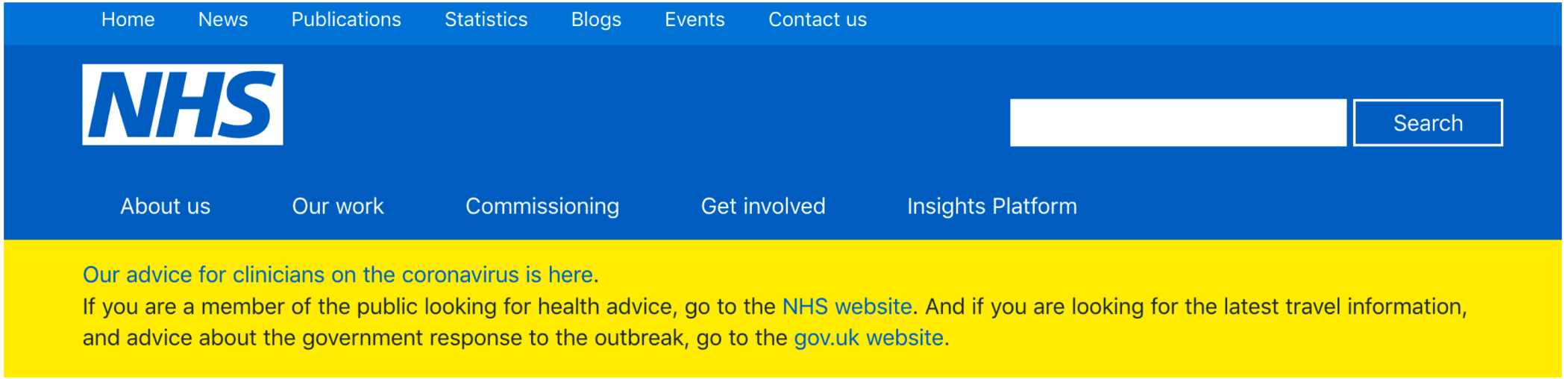
What to look for

# Spinal Malignancy

- Metastases are cancer lesions that have spread from the primary cancer site, to a new and different site in the body. Spinal malignancy refers to metastases which have spread specifically into the spine. Bone is a common site for metastases, known as metastatic bone disease (MBD),

  (Sutcliffe et al 2013).

https://www.england.nhs.uk/2020/11/nhs-to-pilot-potentially-revolutionary-blood-test/

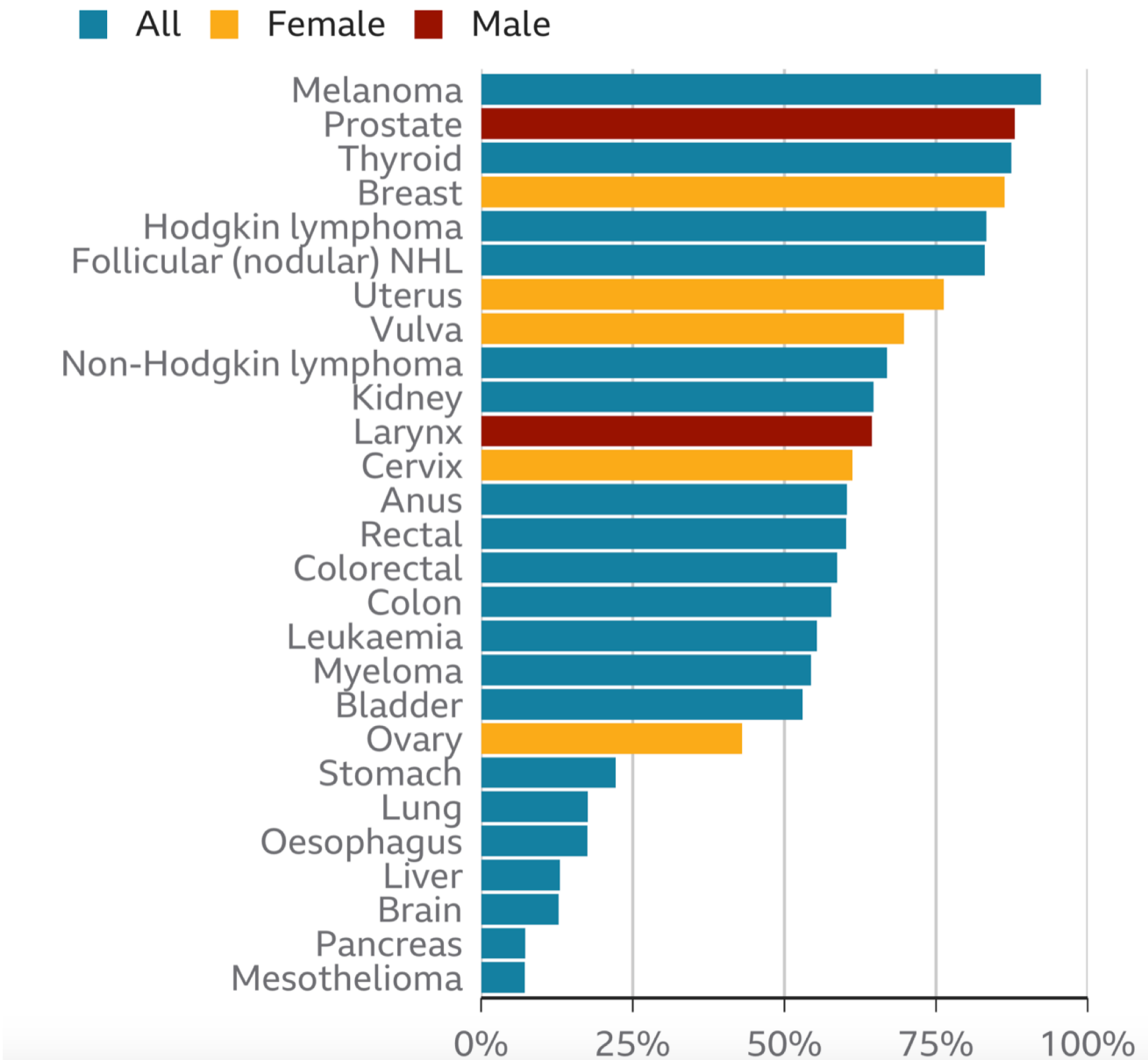


Health

# Galleri cancer test: What is it and who can get it?

2 days ago | Comments

# 5 year survival estimates by cancer type PHE



# Risk of spinal metastases (Coleman & Holen 2014)

- Breast
- Prostate
- Lung
- Thyroid
- Kidney
- Oesophagus
- GI

# Risk of bone metastases development

Reproduced with permission from The Journal of the Royal College of Physicians Edinburgh 2011 41:330-8.

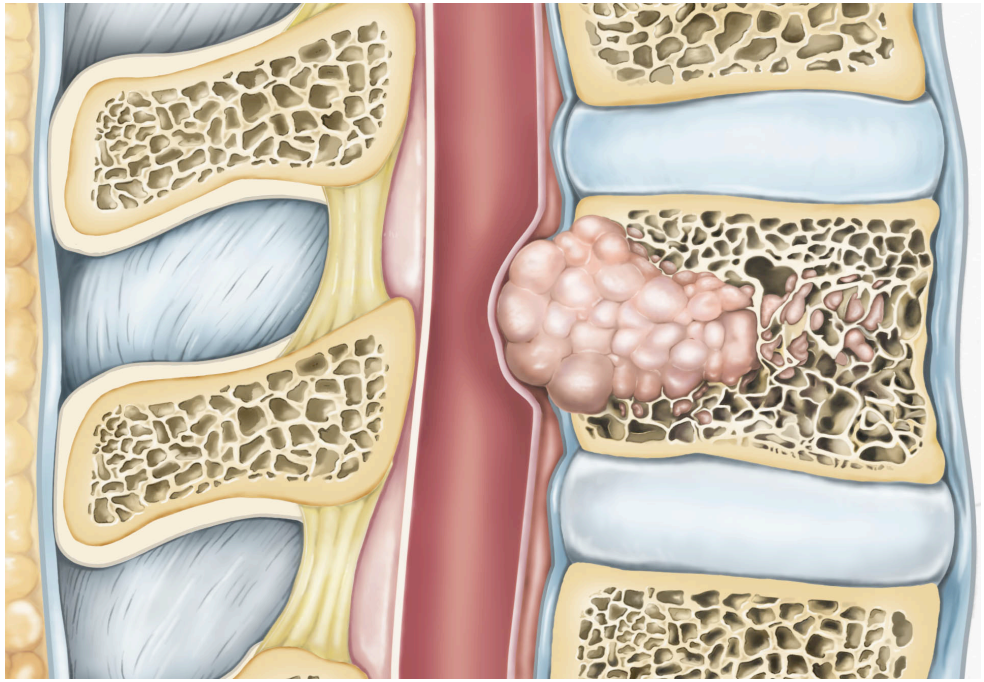
## Low risk Tumours

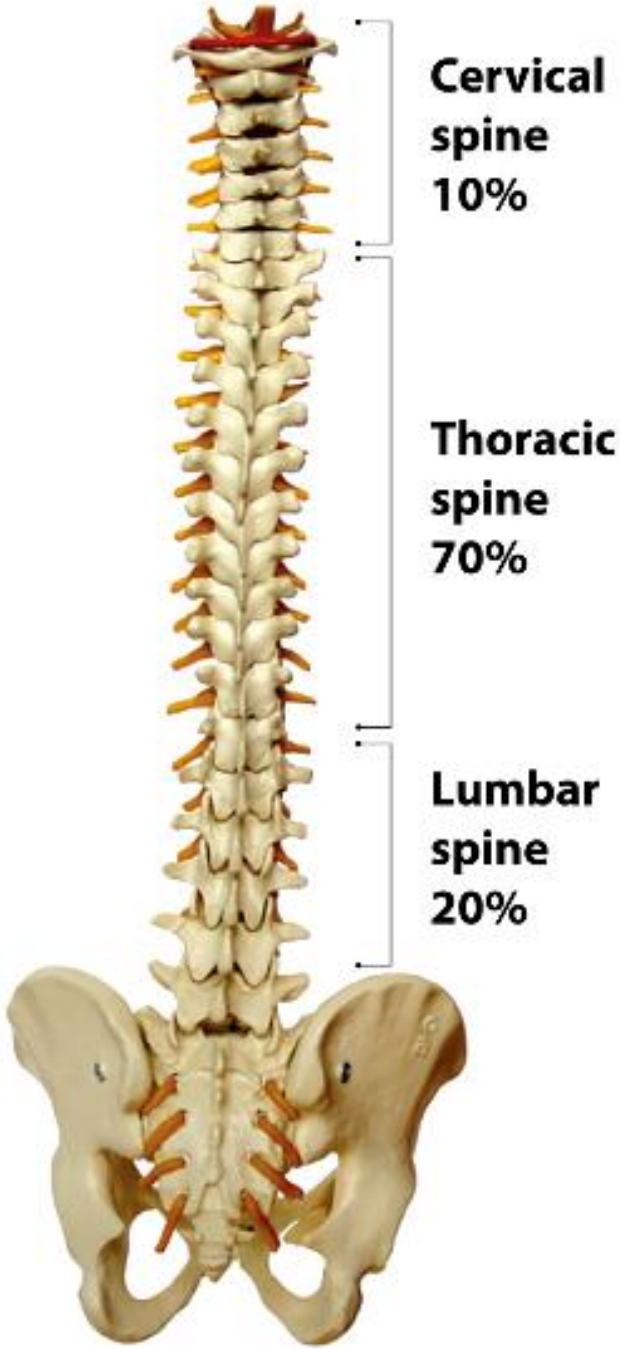
- Tumours that rarely spread to bone, e.g. central nervous system malignancy or ovarian cancer
- Tumours with a low risk of secondary dissemination, e.g. patients treated for breast cancer who at diagnosis had grade 1 tumours of special type, such as ‘tubular’ and/or small tumours of around 1 cm in diameter or less
- Tumours’ that cannot spread, e.g. premalignant conditions such as ductal carcinoma in situ of breast (DCIS)

## High Risk Tumours

- Tumours with a predilection for bony spread: prostate, breast, lung etc
- Patients treated for tumours of high grade and large size, which have shown evidence of a more malignant phenotype, such as local lymph node spread or lymphovascular invasion

# Distribution of MBD





# PH of CA as a red flag?

The Red Flag “history of malignancy” has an increased chance of malignancy from less than 1%, to around 7 % (LR+ ~15)

## TABLE 13 Risk Factors for Spinal Malignancy

| Risk Factor/Level of Evidence | Context | Further Questions | Low Clinical Suspicion | High Clinical Suspicion |
|---|---|---|---|---|
| Past history of cancer<br>High | Not all those cancers with a predilection to bone metastases will develop them. However, some will metastasize in the first 5 y of diagnosis, with 50% doing so 10-20 y later[44]<br>Approximately 25% of people with MSCC have no known primary diagnosis[57] | Do you have any concerns about your symptoms?<br>How long ago was the primary diagnosis made?<br>How big was the primary tumor, and at which stage?<br>Was there any lymph node involvement?<br>Which treatment did you have? | Cancers with a predilection to bone metastases but in an early stage (1 or 2), with no lymph node involvement[62]<br>Cancers that do not have a predilection to bone metastases (eg, ovarian cancer, melanoma[62]) | Cancers that have a predilection to bone metastases (eg, breast, prostate, lung, kidney, and thyroid[10])<br>In breast cancer grade 3 or 4 (late stage), large tumors with lymph node involvement[62]<br>In prostate cancer, a Gleason score of 9 or 10 (despite a PSA level greater than 50 ng/mL at diagnosis) is considered to be an aggressive cancer that is likely to spread more rapidly[4] |

*Abbreviations: MSCC, metastatic spinal cord compression; PSA, prostate-specific antigen.*

# RISK FACTORS


## AGE

Most invasive breast cancers are found in women ages

**55 or older.**



## GENDER

Breast cancer is

**100 times**

more common in women than men. About 287,850 new cases of invasive breast cancer will be diagnosed in 2022.



## FAMILY HISTORY

Women with an **immediate blood relative**, such as a mother or sister, who has had breast cancer are

**twice as likely**

to develop the disease.


## GENETICS

Women with a mutated BRCA1 gene have about a

**55-72 percent**

lifetime risk of developing breast cancer. **The average woman's lifetime risk is 12%.**



## HIGH BREAST DENSITY

Women with less fatty tissue and more glandular and fibrous tissue may be at **higher risk for developing breast cancer.**




## OBESITY

**Fat tissue may contribute** to increases in estrogen levels, and high levels of estrogen may increase the risk of breast cancer.



## HEAVY DRINKING

**Alcohol use is linked** to an increased risk of developing breast cancer. The risk increases with the amount of alcohol consumed.

# Breast cancer

- 1 in 8 life time risk
- Increasing risk with age  with 50% occurring between 50-69 yrs
- Bone is the most common site of mets
- 30% of those diagnosed with primary breast cancer will go onto develop MBD
- 50% occur within 5 years of diagnosis .

# Are you at risk of prostate cancer?

Most men with early prostate cancer don't have any symptoms. That's why it's important to know about your risk.

## 1 in 8

In the UK, about 1 in 8 men will get prostate cancer in their lifetime.

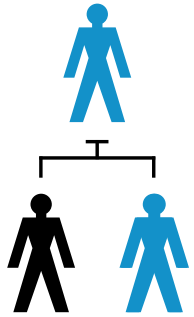
**Prostate cancer is the most common cancer in men in the UK.**

## Over 50 years old

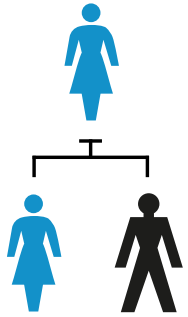
Prostate cancer mainly affects men over 50 and **your risk increases with age**. The most common age for men to be diagnosed with prostate cancer is between 65 and 69 years.

## Family history and genes

You are two and a half times more likely to get prostate cancer if your **father** or **brother** has been diagnosed with it, compared to a man who has no relatives with prostate cancer.



Your risk of getting prostate cancer may also be higher if your **mother** or **sister** has had breast cancer.



## Ethnicity

**Black men are more likely to get prostate cancer than other men, and at a younger age.** In the UK, about 1 in 4 black men will get prostate cancer in their lifetime. If you are a black man, your risk may increase once you're over 45.

PROSTATE CANCER UK

**Speak to our Specialist Nurses**
**0800 074 8383***
**prostatecanceruk.org**


* Call our Specialist Nurses from Monday to Friday 9am - 6pm, Wednesday 10am - 8pm. Calls are recorded for training purposes only. Confidentiality is maintained between callers and Prostate Cancer UK.

5680

Health

# Prostate overtakes breast as 'most common cancer'

By Michelle Roberts
Health editor, BBC News online

27 January 2020

# How does it happen ?

- Direct seeding
- Lymphatic spread
- Hematogenous spread via venous or arterial routes

# What the research says

- Symptoms of (back) pain common
- Early detection is crucial
- Assess the patients risk

# Early detection

- Patients who have a single MBD do well
- Those patients who have bone only do better than those who have bone and visceral
- The greater the burden of the disease the worse the prognosis

Physiotherapy Practice and Research 38 (2017) 73–77
DOI:10.3233/PPR-170095
IOS Press

Clinical Commentary

# Which red flags aid the early detection of metastatic bone disease in back pain?

Laura Finucane[a,*], Susan Greenhalgh[b] and James Selfe[c]

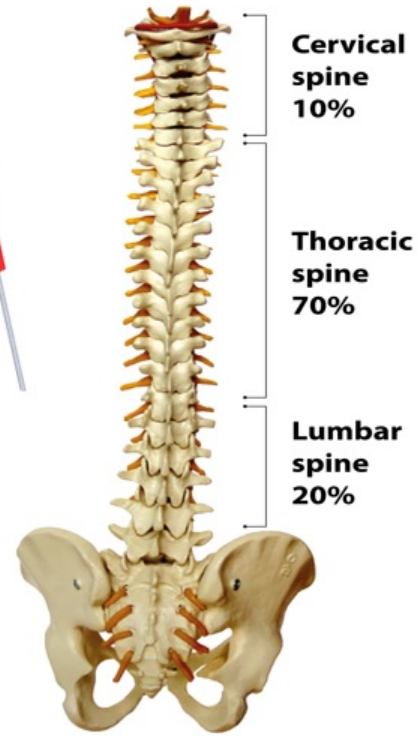
***Early identification can impact significantly on a patients prognosis and quality of life***

Not all patients with a PH Ca will develop metastases,
(eg 30% of breast cancer patients)
who then should we be concerned about?

- Understand the *RELATIVE* risk of metastases in patients with a PH Ca (30% breast cancer patients will develop mets- )
- Closely *OBSERVE* patients at risk over time
- Be suspicious of *NEW* onset of symptoms progressively worsening
- *'OMINIOUS'* Night pain - *AGGRAVATED* by lying rather than relieved

@laurafinucaneB

**Distribution of MBD affecting the spine**
(Breast, prostate& lung
have an affinity to the spine)



# Clinical presentation of MBD

| **symptom** | **Description** |
| --- | --- |
| **Pain** | |
| • Local | • Persistent, gnawing, ache |
| • Mechanical | • Aggravated by movement |
| • Radicular | • Sharp, shooting, stabbing |
| • **Night pain** | • Worst time, aggravated by lying |
| • **Hypercalcemia** | • Fatigue, nausea, anaemia |
| • **Other symptoms** | • Band like pain, vague leg symptoms |

# Night pain

- Worse time
- ‘ominous’ (Tse et al  2014)
- Worse on lying better on movement
- Often drives patient to A&E in the middle of the night
- Report having to sleep sitting upright

## TABLE 14 Symptoms of Spinal Malignancy

| Symptoms (subjective)/ Level of Evidence | Context | Further Questions | Low Clinical Suspicion | High Clinical Suspicion |
|---|---|---|---|---|
| Severe pain that may become progressive and constant<br>Low | MBD does not have a linear progression and is more likely to wax and wane, but in the later stages it becomes more constant and progressive. People may report escalating pain, which can increase when lying flat[79] | Are your symptoms getting better, the same, or worse?<br>Do you have band-like pain? | The person presents with initial severe pain but reports improvement with treatment; it is important to continue to evaluate, as the person may be in a good phase | Subjective reports of progressively worsening symptoms, with possible features of band-like pain, and inability to lie flat |
| Night pain<br>Low | Most people with back pain will suffer from night pain. People who report being woken on movement and subsequently are unable to get comfortable and go back to sleep are of less concern than those who describe an inability to get back to sleep due to the intensity of symptoms and who report having to get up to relieve the pain[25] | Does your pain wake you at night?<br>What do you have to do to get back to sleep?<br>Does your night pain occur in a particular position? | The person reports that he or she is able to get back to sleep following a change of position or after taking medication | People who report having to walk the floors or sit in a chair or lie on the floor, with minimal relief |
| Systemically unwell<br>Low | These are often symptoms described in the late stages of the disease and may include fatigue, nausea, anorexia, and constipation, which are symptoms suggestive of hypercalcemia[24]<br>Constipation is not necessarily a systemic complaint<br>These could appear on their own or as a cluster of symptoms | Do you feel well?<br>• If not, then explore the features of hypercalcemia<br>• Establish whether these symptoms could be associated with other causes | Able to associate with another cause | May describe the features of hypercalcemia, such as fatigue, nausea, stomach pain, and fever. These also tend to be progressive in nature |

# Other symptoms

- **Hypercalcemia**
- Nausea
- Fatigue
- Anorexia
- Constipation
- Often vague and non specific

## TABLE 15 Signs of Spinal Malignancy

| Signs (objective)/ Level of Evidence | Context | Physical Assessment | Low Clinical Suspicion | High Clinical Suspicion |
|---|---|---|---|---|
| Altered sensation from trunk down<br>Low | People might report altered sensation that is nondermatomal and describe strange feelings in the legs (often a vague and non-specific, difficult-to-describe sensation). People may report decreased mobility[79] | Neurological examination testing Sensation throughout the area described by the patient | Normal neurology and no objective change in sensation | Objective signs and reduced sensation |
| Neurological signs<br>Low | People who present with a subjective complaint of neurological symptoms must have a full neurological examination | Neurological examination that may need to include the upper and/or lower limbs, including upper and lower motor neuron clinical tests | Localized spinal pain with no distal referral or limb symptoms | People with symptoms in the limbs and/or with coordination/gait disturbance, or changes to bladder/bowel activity |
| Spine tenderness<br>Low | Sometimes, the spine can be tender on percussion. However, lack of tenderness does not rule out the possibility of metastases<br>It is important to percuss the whole spine, as the area of pain reported may not be the area of metastasis | The clinician should palpate the spinous processes and may use percussion/vibration with a 128-Hz tuning fork to further examine spinal tenderness or reproduction of symptoms | No tenderness on palpation or percussion/vibration | Tenderness or reproduction of symptoms on palpation or percussion/vibration |

## TABLE 16 Initial Investigations for Spinal Malignancy

| Modality | Context |
|---|---|
| MRI | MRI is the gold standard for diagnosing MBD[78]<br>Because the sensory level does not always correspond to the level of metastases if MBD is suspected, MRI of the whole spine is required[46] |
| CT scan | If there are contraindications to MRI |
| Blood tests | There is no combination of inflammatory markers that can be used as a reliable rule-in or rule-out test strategy. The decision to test must be made in the context of other clinical findings[84] |

*Abbreviations: CT, computed tomography; MBD, metastatic bone disease; MRI, magnetic resonance imaging.*

# Be Clear on cancer campaigns

- aim to improve early diagnosis of **cancer** by raising public awareness of signs and/or symptoms of **cancer**, and to encourage people to see their GP without delay

- https://campaignresources.phe.gov.uk/resources/campaigns/16-be-clear-on-cancer/overview

# What patients are told to look out for

- pain in bones (especially proximal bones such

  as the back, hips or ribs) that doesn't improve

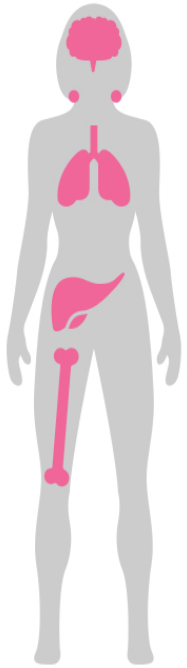
  with pain relief, persists for more than one to two

  weeks and is often worse at night
- unexplained weight loss and a loss of appetite
- a constant feeling of nausea
- discomfort or swelling under the ribs or across

  the upper abdomen
- feeling constantly tired
- a dry cough or a feeling of breathlessness
- severe or ongoing headaches
- altered vision or speech.

# Secondary Breast Cancer

## Also known as metastatic or advanced breast cancer



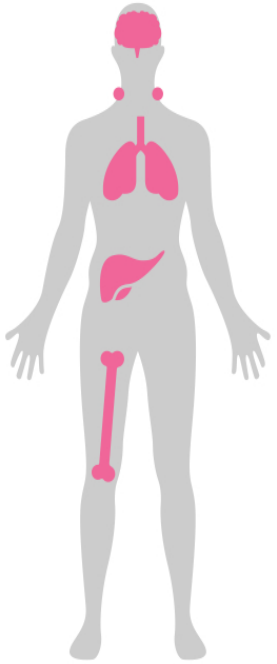
If you have survived primary breast cancer be aware of these **RED flags*** for secondary breast cancer. There are 5 main areas that secondary breast cancer can appear.

### BRAIN

Frequent headaches, vomiting (first thing in the am), dizzy, visual disturbance, fits, impaired intellectual function, mood swings, balance, fatigue. Family members and friends may say you are not your normal self.

### BONE

Pain in bones — commonly thigh, arm ribs and back. Can be dull ache or sharp shooting pain. Bone pain with no obvious cause or haven't fallen over, report any new, unusual and increasing pain.



### LYMPH NODES

Swelling or lumps and pressure in chest/armpit/ neck areas, dry cough.

### LUNG

Sharp pain on breathing in chest and back area, non productive cough, fatigue, blood clots can also cause shortness of breath.

### LIVER

Bloating, affected appetite, weight loss, fatigue, weak, pain near ribs on right hand side.

Please visit: abcdiagnosis.co.uk

Twitter: @abcdiagnosis

Facebook: facebook.com/abcdiagnosis

***RED FLAG SYMPTOMS NEED TO BE REPORTED TO YOUR ONCOLOGIST**

abcd

After Breast Cancer Diagnosis

# A patients perspective

- 8% expected it to be secondaries
- 58% did not know what the S&S were
- 64% did not suspect they had secondaries
- 60% were not informed

# Secondary breast care Report 2016
# BCC UK-Recommendations

- Flagging system for GPs  on patients records
- A guide to red flag symptoms inc back pain
- Resources for GPs
- Direct referral back into system for GPs
- Guidance for primary care professionals on recognition and referral of potential secondary breast cancer

# Implications for practice

- Know which cancers have an affinity to metastasise
- Know the patients relative risk
- Use red flags in conjunction
- New symptoms that are persistent  need to be evaluated with a high suspicion