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Brain tumour - suspected

1 Background information

Quick info:

Scope:
- diagnosis of suspected brain tumours in adults over age 16 years
- management, including:
  - primary cerebral tumours
  - secondary brain tumours, ie metastases from a known or unknown primary site in adults
  - multidisciplinary assessment and primary management decisions for brain tumour following initial imaging
  - further management of brain tumour following initial imaging and surgical biopsy or resection

Out of scope:
- specific management of:
  - skull-based tumours, including acoustic neuromas
  - optic gliomas
  - medulloblastomas
  - pituitary tumours
  - central nervous system (CNS) lymphomas
  - pineal tumours
- tumours in patients under age 16 years

Definition:
- tumour found in the intracranial portion of the CNS:
  - tumours may be primary, or metastases from a known or unknown primary site of malignancy, eg breast or lung
  - the classification of brain tumours by the World Health Organization (WHO) as grades I or II (low grade) or grades III or IV (high grade) reflects the speed of growth of the tumour – these terms are now considered preferable to the terms 'malignant' or 'benign':
    - all brain tumours, regardless of whether they are classed as high or low grade, should receive the same national cancer standards for time to referral and treatment

Incidence:
- primary brain tumours are relatively uncommon, accounting for 2% of cancers diagnosed in England and Wales [3]
- among primary brain tumours, high grade glioma is the most common type
- annual incidence of high grade glioma is 5/100,000 in England and Wales [2]
- after a peak in childhood, the incidence of brain tumours rises with age to reach its highest point between age 75-79 years [1]

Risk factors:
- while a number of epidemiological risk factors have been suggested, the aetiology of primary brain tumours is not well understood
- the only known associations are:
  - family history of early-onset malignancy
  - a variety of familial syndromes, eg:
    - neurofibromatosis types 1 and 2
    - tuberous sclerosis
  - previous radiotherapy to the head or neck (rare)
  - a weakened immune system (slightly increased risk)

Prognosis:
- depends on:
  - whether the tumour is primary, or has metastasised from an extracranial site
  - anatomical site (whether the tumour is suitable for resection)
  - the histology of the primary brain tumour
  - whether any metastases are solitary or multiple
- other factors to note regarding prognosis include:
  - the rigid nature of the skull means that even a small, slow-growing tumour can cause severe symptoms and detrimental (even fatal) effects when it raises intracranial pressure (ICP)
  - slow-growing tumours in the brain can infiltrate extensively into adjacent normal tissue, making excision impossible
  - the vital functions of the brain, in which these tumours arise, pose a particular challenge for surgical excision
  - a slow-growing tumour may undergo transformation to an aggressive tumour
- the 1 year standardised survival rate for high grade tumours is approximately 30-40% across males and females from English, Welsh, and European registers [1]

NB: This information appears on each page of this care map.

This information was drawn from the following references:
Brain tumour - suspected


2 Information resources for patients and carers

Quick info:
Patients and carers in England can access this care map through NHS Choices at http://healthguides.mapofmedicine.com/choices/map/brain_tumour1.html

The following resources have been produced by organisations certified by The Information Standard:
- 'Brain cancers' (URL) from Datapharm at www.medguides.medicines.org.uk
- 'Brain tumour: a guide for patients and carers' (URL) from the Brain and Spine Foundation at http://www.brainandspine.org.uk
- 'Brain tumours' (URL) from Bupa at http://www.bupa.co.uk
- 'Brain tumours' (URL) from CancerHelp UK at http://www.cancerhelp.org.uk
- 'Brain tumours' (URL) from Macmillian Cancer Support at http://www.macmillan.org.uk
- 'Cancer – an overview' (URL) from Bupa at http://www.bupa.co.uk
- 'Cancer of the brain and brain tumours' (PDF) from Patient UK at http://www.patient.co.uk
- 'Healthcare services for people with brain and other central nervous system tumours' (PDF) from the National Institute for Health and Clinical Excellence (NICE) at http://www.nice.org.uk
- 'Secondary brain tumours' (URL) from Macmillian Cancer Support at http://www.macmillan.org.uk
- 'Treating brain tumours with photodynamic therapy' (PDF) from NICE at http://www.nice.org.uk

The following resources have been written or recommended by national policy bodies or guideline producers whose content has informed this care map:
- 'Brain tumour (benign)' patient leaflet (URL) from Clinical Knowledge Summaries (CKS) at http://www.cks.nhs.uk
- 'Brain tumour (high-grade)' patient leaflet (URL) from Clinical Knowledge Summaries (CKS) at http://www.cks.nhs.uk
- 'Brain tumour (low-grade/mixed)' patient leaflet (URL) from Clinical Knowledge Summaries (CKS) at http://www.cks.nhs.uk

Information for carers and people with disabilities is available at:
- 'Caring for someone' (URL) from Directgov at http://www.direct.gov.uk
- 'Disabled people' (URL) from Directgov at http://www.direct.gov.uk

Patient stories describing their care journeys are available at 'Healthtalkonline' (URL) from DIPEx at http://www.healthtalkonline.org

Explanations of clinical laboratory tests used in diagnosis and treatment are available at 'Understanding Your Tests' (URL) from Lab Tests Online-UK at http://www.labtestsonline.org.uk

The Map of Medicine is committed to providing high quality health and social care information for patients and carers. For details on how these resources are identified, please see Map of Medicine Patient and Carer Information.

NB: This information appears on each page of this care map.

3 Updates to this care map

Quick info:
Date of publication: 31-Oct-2011
Interim update:
The clinical content of this care map has been accredited by the National Cancer Action Team.

Date of publication: 29-Jul-2011
This care map was updated in line with the following guidelines:

Further information was provided by the following references: [3,4,15,17,24].

For further information, please see the care map's Provenance.
Brain tumour - suspected

The second page was renamed 'Brain tumour - radiologically diagnosed' from 'Brain tumour - confirmed'.
The third page was renamed 'Primary brain tumour - management' from 'Brain tumour - management'.
NB: This information appears on each page of this care map.

4 Brain tumour - clinical presentation

Quick info:
Clinical features may not reliably distinguish low grade from high grade, or primary from non-primary tumours – they include:

- new onset partial or generalised seizures
- persistent headaches with features of raised intracranial pressure (ICP), including:
  - waking at night
  - headache present on waking
  - associated symptoms, which might include:
    - nausea
    - vomiting
    - neurological deficit
- focal neurological signs, eg:
  - hemiparesis
  - anopias
  - visual loss
  - focal motor abnormality
  - cerebellar signs
  - dysphagia
  - dysphasia
- signs of raised ICP:
  - papilloedema (the absence of papilloedema does not exclude raised ICP)
  - altered levels of consciousness
  - sixth nerve palsy
- change in personality, behaviour, or cognitive ability

Clinical presentation may indicate referral to the following, for problems not initially thought to be tumour related:

- neurology
- ophthalmology
- endocrinology
- general medicine

This information was drawn from the following references:

5 History and examination

Quick info:
History:
- onset and duration of symptoms
- nature of headaches:
  - frequency and duration
  - severity
  - location
- associated features, eg:
  - nausea and vomiting
  - worse in the morning
  - relation to posture
- description of seizures if present
Brain tumour - suspected

- routinely ask about symptoms from likely sites for primary tumours that may spread to the brain (lung cancer, breast cancer, colorectal cancer, and melanoma)
- other neurological signs
- previous medical history
- current medications
- past history of cancer is suggestive of metastatic cancer

Examination:
- assess mental state
- perform full neurological examination – this must include assessment of visual acuity, fundoscopy, and visual fields

This information was drawn from the following references:

6 Consider urgent referral to medicine or neurology

Quick info:
Urgent referral (maximum 2-week wait) is required for patients with:
- new onset partial or generalised seizures
- persistent headaches with features of raised intracranial pressure (ICP), including:
  - waking at night
  - headache present on waking
  - associated symptoms, which might include:
    - nausea
    - vomiting
    - neurological deficit
- focal neurological signs, eg:
  - hemiparesis
  - anopias
  - visual loss
  - focal motor abnormality
  - cerebellar signs
  - dysphagia
  - dysphasia
- signs of raised ICP:
  - papilloedema (the absence of papilloedema does not exclude raised ICP)
  - altered levels of consciousness
  - sixth nerve palsy
  - change in personality, behaviour, or cognitive ability

This information was drawn from the following references:

8 Urgent contrast-enhanced CT scan or MRI of the brain

Quick info:
Request urgent (contrast enhanced) CT scan or MRI of the brain [1,9]:
- if local service arrangements allow, consider performing scan while specialist appointment is awaited [10]
9 Complete the venous thromboembolism (VTE) risk assessment

Quick info:
All patients should undergo venous thromboembolism (VTE) risk assessment as per National Institute for Health and Clinical Excellence (NICE) guidance [26]:
• upon admission
• for a second time, within 24 hours of initial assessment
• regularly thereafter for the duration of the inpatient stay, and, in some cases, following discharge
• whenever the clinical situation changes

Reference:

10 Brain tumour suspected by imaging

Quick info:
Neuroradiological features suggestive of a brain tumour are [9]:
• lesion within brain parenchyma (not on surface)
• heterogeneous lesion (tends to enhance with intravenous [IV] contrast)
• surrounding cerebral oedema
• infiltration of surrounding brain parenchyma

Reference:

11 Inform referring clinician immediately

Quick info:
Immediately inform referring clinician of imaging results [3].

Reference:

12 Consider medication for raised intracranial pressure (ICP)

Quick info:
Features of raised intracranial pressure (ICP) include [10,12]:
• clinical signs:
  • reduced [Glasgow coma scale](GCS)
  • nausea

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Brain tumour - suspected

- vomiting
- postural headache
- papilloedema – however, absence of papilloedema does not exclude raised ICP

CT scan or MRI features:
- effacement of the cerebral sulci
- enlargement of the lateral or third ventricles (hydrocephalus)
- herniation of lobes

Consider steroids:
- for patients presenting with raised ICP or progressive focal deficit, unless infection or primary central nervous system (CNS) lymphoma is suspected [3]
- discuss indications for steroids and appropriate doses with on-call neuro-surgical specialist service [3]
- oral administration of dexamethasone to reduce cerebral oedema [10]
- start a proton pump inhibitor (PPI; eg omeprazole, lansoprazole) alongside corticosteroids to reduce risk of steroid induced gastrointestinal (GI) ulceration [10]

Consider anticonvulsants for patients presenting with seizures [3].

References:

13 Emergency management for raised ICP

Quick info:
Control intracranial pressure (ICP) [3]:
- raise the patient's head by elevating the head of the bed by 30°
- provide analgesics for relieving pain associated with raised ICP
- consider mannitol to reduce cerebral oedema
- perform neurological observations at least hourly
- ensure early discussion with neuro-surgical registrar takes place

Reference:

15 NS MDT review

Quick info:
Ensure clinical information is available, including co-morbidities and imaging [3].

Emergency surgery may be necessary before full neuroscience (NS) multidisciplinary team (MDT) review is possible – in such cases intervention should be carried out according to protocol and discussed at the MDT as soon as possible [1].

Initial diagnosis and management should be provided through a network of MDT review [1]:
- initial assessment should consider whether [1]:
  - an additional MRI brain scan is required to:
    - obtain a more definitive diagnosis
    - discriminate between areas of infarction and tumour
    - assist planning for surgery and radiotherapy
  - the patient is fit for surgery
  - emergency surgery is needed, eg to manage raised intracranial pressure (ICP)
  - surgery is needed to guide the management plan
- MDTs ensure:
  - rapid communication with GP [3]
  - the patient is considered from a range of viewpoints and expertise [13]
  - learning is shared between professionals [13]
  - a greater probability of timely, appropriate treatment, and better continuity of care [13]
  - key worker is allocated to ensure continuity of care, and provide patient information and support [13]
  - patients are offered clinical trials where available [3]
- NSMDT should include [1]:
  - neurosurgeon

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Brain tumour - suspected

- neuroradiologist
- neuropathologist
- neurologist
- oncologist
- clinical nurse specialist
- palliative care specialist
- key worker (usually the nurse specialist)
- designated coordinator
- neuropsychologist
- specialist health professionals, including:
  - occupational therapy
  - physiotherapy
  - speech and language therapy
  - others as appropriate
- NSMDT should [1]:
  - review clinical history and radiological imaging (CT scan or MRI) at initial diagnosis, during further investigations and throughout initial management
  - develop and instigate initial management plan, including:
    - surgery
    - radiotherapy; or
    - chemotherapy
  - further review patients as directed by cancer network MDT
  - fully inform and refer to cancer network MDT
  - fully inform locally referring clinician or team of management plan

References:

Brain tumour - suspected

Key Dates

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Accreditations

The care map is accredited by:
National Cancer Action Team (NCAT):

Disclaimer

The care map is accredited by:
The Chief Knowledge Officer of the NHS:

Disclaimer

Evidence summary for Brain tumour - suspected

This care map has been developed according to the Map of Medicine editorial methodology (http://mapofmedicine.com/whatisthemap/editorialmethodology). The content of this care map is based on high-quality guidelines [1,2,5,6,8,9,13,26], critically appraised meta-analyses and systematic reviews [20-23,25] and safety and prescribing information [18]. Practice-based knowledge has been added by contributors with front-line clinical experience [3,7,10], including any literature endorsed by the contributor group [4,11,12,14-17,19,24]. The evidence-based, practice-informed care map has been peer-reviewed by central committees within stakeholder groups.

Search date: Nov-2009

References

This is a list of all the references that have passed critical appraisal for use in the care map Brain tumour

<table>
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<tr>
<th>ID</th>
<th>Reference</th>
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<td>10</td>
<td>Contributors representing the National Cancer Action Team. 2010. <a href="https://subscriptions.nccn.org/login.aspx">https://subscriptions.nccn.org/login.aspx</a></td>
</tr>
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</table>
Brain tumour - suspected

ID Reference


Disclaimers

National Cancer Action Team (NCAT)
It is not the function of the National Cancer Action Team to substitute for the role of the clinician, but to support the clinician in enabling access to know-how and knowledge. Users of the Map of Medicine are therefore urged to use their own professional judgement to ensure that the patient receives the best possible care. Whilst reasonable efforts have been made to ensure the accuracy of the information on this online clinical knowledge resource, we cannot guarantee its correctness or completeness. The information on the Map of Medicine is subject to change and we cannot guarantee that it is up-to-date.

The Chief Knowledge Officer of the NHS
Brain tumour - suspected

It is not the function of the Chief Knowledge Officer of the NHS to substitute for the role of the clinician, but to support the clinician in enabling access to know-how and knowledge. Users of the Map of Medicine are therefore urged to use their own professional judgement to ensure that the patient receives the best possible care. Whilst reasonable efforts have been made to ensure the accuracy of the information on this online clinical knowledge resource, we cannot guarantee its correctness or completeness. The information on the Map of Medicine is subject to change and we cannot guarantee that it is up-to-date.