THE DIAGNOSIS OF BRAIN TUMOURS IN CHILDREN: A GUIDELINE FOR HEALTHCARE PROFESSIONALS

Headaches

- Consider a brain tumour in any child with a new, persistent* headache
- Headache in isolation, unlikely to be a brain tumour
- Brain tumour headaches occur at any time of day
- Children aged younger than 4 years may not be able to describe a headache – observe behaviour

CNS imaging required with

- Persistent headache that wakes a child from sleep
- Persistent headache that occurs on waking
- Persistent headache in a child under 4
- Confusion or disorientation with a headache
- Persistent headache with 1 or more other symptoms

Common pitfalls

- Failure to reassess a child with a migraine or tension headache when the headache character changes

**Persistent = continuous or recurrent headache present for more than 4 weeks*

Nausea and vomiting

- Consider a brain tumour in any child with persistent* nausea and/or vomiting
- Head circumference should be measured and plotted in children under 2 with persistent vomiting

CNS imaging required with

- Persistent vomiting on waking (NB: exclude pregnancy where appropriate)
- Persistent nausea/vomiting with 1 or more other symptom

Common pitfalls

- Failing to consider a CNS cause for persistent nausea and vomiting

**Persistent = nausea and/or vomiting present for more than 2 weeks*

Visual signs and symptoms

- Consider a brain tumour in any child with persistent* visual abnormality
- Visual assessment requires assessment of:
- visual acuity
- eye movements
- pupil responses
- optic disc appearance
- visual fields (>/= 5 yrs)
- Pre-school and unco-operative children should be assessed by hospital eye service within 2 weeks of referral
- Parent concern alone warrants referral for visual assessment

CNS imaging required with

- Papilloedema
- Optic atrophy
- New onset nystagmus
- Reduction in visual acuity not due to refractive error
- Visual field reduction
- Proptosis
- New onset paralytic squint
- Visual symptom with 1 or more other symptom

Common pitfalls

- Failure to fully assess vision – REFER IF NECESSARY
- Failure of communication between community optometry and primary and secondary care

**Persistent = visual abnormality present for more than 2 weeks*

Referral from primary care

- High risk of tumour – SAME DAY referral to secondary care
- Lower risk* – specialist assessment within 2 weeks

Imaging

- High risk of tumour – URGENT CNS imaging
- Lower risk* – CNS imaging within 4 weeks

**Lower risk = CNS tumour in differential diagnosis, low index of suspicion*

CONSIDER A BRAIN TUMOUR IN ANY CHILD PRESENTING WITH

- Headache
- Nausea and/or vomiting
- Visual symptoms and signs:
  - reduced visual acuity and/or fields
  - abnormal eye movements
  - abnormal fundoscopy
- Motor symptoms and signs:
  - abnormal gait
  - abnormal co-ordination
  - focal motor weakness
- Growth and endocrine symptoms:
  - growth failure (weight/height)
  - delayed, arrested or precocious puberty
  - galactorrhoea
  - primary/secondary amenorrhea
- Increasing head circumference
- Behavioural change
- Diabetes insipidus
- Seizures (see www.nice.org.uk/guidance/qs27)
- Altered consciousness (see www.nottingham.ac.uk/paediatric-guideline/Guidelinealgorithm.pdf)

Assess these children with

- History: associated symptoms, any predisposing factors
- Examination of:
  - visual system
  - motor system
  - height and weight
  - head circumference (<2yrs)
  - pubertal status

IF TWO OR MORE SYMPTOMS – SCAN

Ask about common predisposing factors

- Personal or FH of brain tumour, sarcoma, leukaemia or early onset breast cancer
- Neurofibromatosis
- Tuberous sclerosis
- Other familial genetic syndromes

Assessment pitfalls

- Initial symptoms of brain tumour can mimic other common illnesses
- Symptoms frequently fluctuate – resolution then recurrence does not exclude a brain tumour
- A normal neurological examination does not exclude a brain tumour
- Language difficulties – use interpreter

This guideline has the support of the RCPCH following a rigorous assessment of the guideline development methodology and a full endorsement is expected upon completion of a full stakeholder consultation.

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Head circumference

- Consider a brain tumour in any child under two years with an increasing head circumference outside the normal range in comparison to their height and weight
- Careful assessment of other signs and symptoms of a brain tumour should be undertaken in these babies

CNS imaging required with

- Rapid rate of head circumference growth crossing centiles
- Increasing head circumference with any other associated symptoms

Common pitfalls

- Failing to measure and monitor head circumference in a baby or young child with persistent vomiting

Motor symptoms and signs

- Consider a brain tumour in any child with persisting* motor abnormality
- Motor assessment requires history or observation of:
  - sitting and crawling in infants
  - walking and running
  - handling of small objects
  - handwriting in school age children
- Brain tumours can cause a loss or change in motor skills and this can be subtle e.g. ability to play computer games

CNS imaging required with

- Regression in motor skills
- Focal motor weakness
- Abnormal gait/co-ordination (unless local cause)
- Bells palsy with NO improvement within 4 weeks
- Swallowing difficulties (unless local cause)
- Head tilt/torticollis (unless local cause)
- Motor symptom with 1 or more other symptom

Common pitfalls

- Attributing abnormal gait/balance to middle ear disease with no corroborating findings
- Failure to identify swallowing difficulties and aspiration as a cause of recurrent chest infections

**Persistent = motor abnormality present for more than 2 weeks*

Growth and endocrine

- Consider a brain tumour in any child with any combination of growth failure, delayed/arrested puberty and polyuria/polydipsia
- Early specialist assessment if required for:
  - precocious puberty/delayed or arrested puberty
  - growth failure
  - galactorrhoea
  - primary or secondary amenorrhoea

CNS imaging required with

- Growth or endocrine symptom with 1 or more other symptoms

Common pitfalls

- Failing to consider a CNS cause in children with weight loss and vomiting
- Failure to consider diabetes insipidus in children with polyuria and polydipsia

Behaviour

- Consider a brain tumour in any child with new onset lethargy, mood disturbance, withdrawal or disinhibition

Common pitfalls

- Failing to consider a physical cause for behavioural symptoms