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 occur 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:

- Persistent vomiting on awakening (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 SYMPTOMS AND SIGNS

- 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 uncooperative 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 coordination
- 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 http://www.nottingham.ac.uk/paediatric-guideline/Guideline%20algorithm.pdf)

ASK ABOUT COMMON PREDISPOSING FACTORS:

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

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

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**

HEAD CIRCUMFERENCE

- Consider a brain tumour in any child 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:

- Rapid rate of head circumference growth crossing centiles
- Increasing head circumference with ny 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*

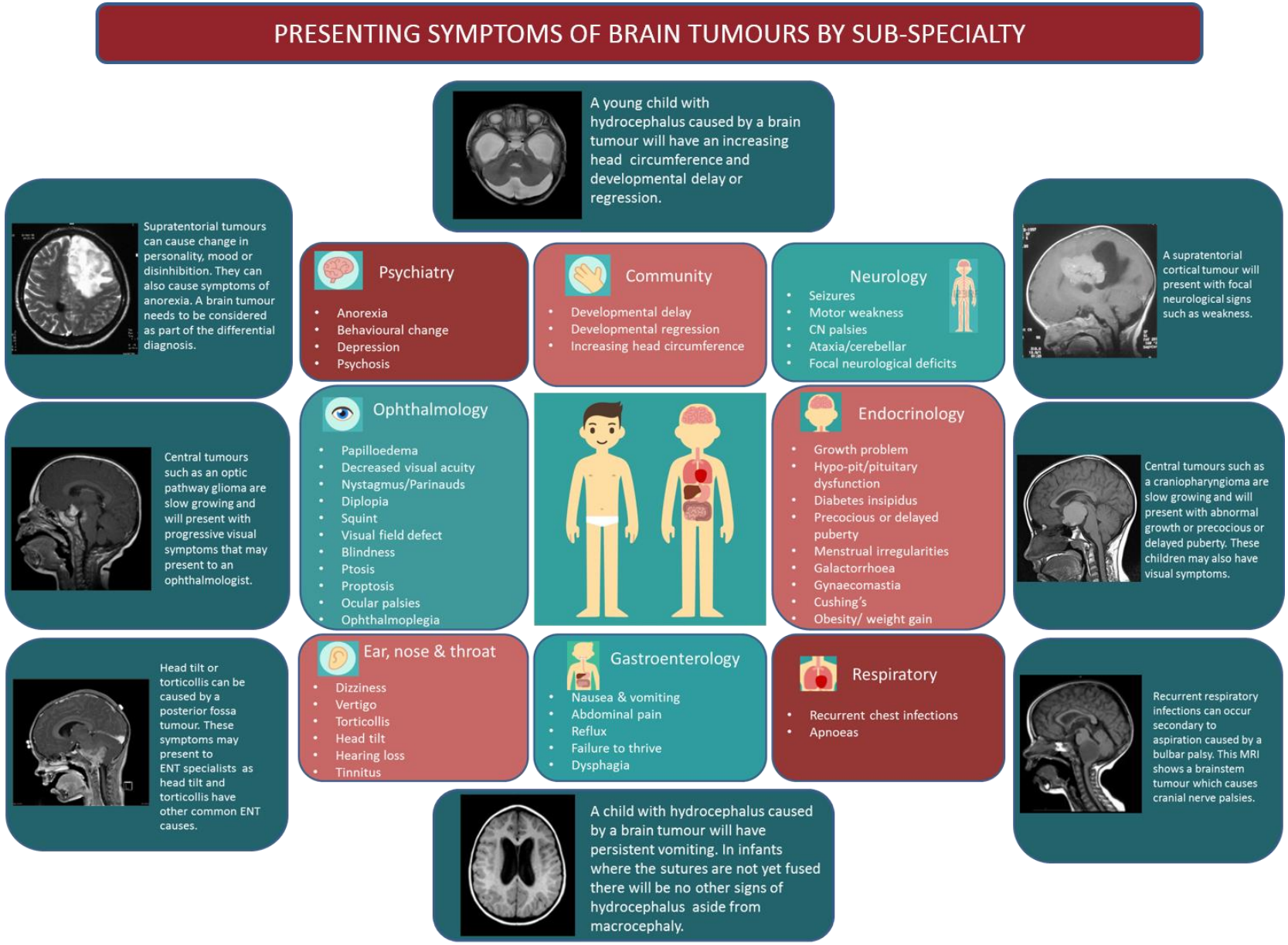

Figure 10. Brain tumour presentation by specialty