SANON 2016
Improving the management of intracranial tumours in the acute receiving setting.

Oncology Quality Improvement Project

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CT1 Acute Medicine
(Clinical Development Fellow Oncology/Neurology)
Introduction

• The Project
  ▫ “Improving the management of intracranial tumours in the acute receiving setting.”
    • Recognition of the well, unwell and deteriorating patient.
    • Clear, evidence based guidance for managing medically.
    • Defining appropriate referral pathway

• Why?
  ▫ Own experience
    • Interesting clinical topic
    • Often challenging
  ▫ Meeting with Specialist Consultants
    • Feeling lack of confidence prior to ECNO contact
    • ‘Room for improvement’.
• How?
  ▫ Interactive survey
    • Assess confidence
    • Determine current practice

• Where?
  ▫ NHS Lothian – RIE, SJH, WGH

• Who?
  ▫ Two cohorts:
    • Specialists
    • Non-specialists

• Intervention
  • Develop and disseminate specialist clinical guidance
Literature Search

• How intracranial tumours present
  ▫ Asymptomatic
  ▫ Headache
  ▫ Focal Neurology or Global Impairment
  ▫ First seizure

• How tumours cause symptoms
  ▫ Directly – tumour mass, oedema
  ▫ Seizures

The rationale for treatments used to alleviate symptoms

- Steroids
- Antiepileptics
- Surgery
- Chemotherapy/Radiotherapy
Literature Search

- Steroid Guidelines

  - Difficult to find, difficult to create

  - Expert Consensus
    3. Dexamethasone treatment in patients with brain metastases and primary brain tumors: do the benefits outweigh the side-effects? 2002

  - Only 1 RCT – Evidence Level B
    1. Dose-effect relationship of dexamethasone on Karnofsky performance in metastatic brain tumors: a randomized study of doses of 4, 8, and 16 mg per day.
Literature Search - Summary 2

- Anti-epileptics
  - Patients who have single seizure are at high risk of seizure recurrence.
  - Anticonvulsants required in addition to definitive oncology management.
  - No evidence to support the use of anticonvulsant prophylaxis
  - A need for RCTs investigating the choice of anticonvulsant
  - Non-Enzyme-inducers favored - Levetiracetam (Keppra) and Sodium Valproate (Epilim)


Method - Identify the need for QI

- No comparable “Gold Standard”
- MSN Guidance currently refers to ‘local policy’
Managed Service Network for Neurosurgery

www.mns-neuro@nhslothian.scot.nhs.uk

Consultation document – please send comments to: msn.neuro@nhs.net

Response deadline: August 31st 2016

Adult Brain Tumour Pathway – notes for interpretation

1. Dexamethasone to be commenced as per local policy depending on the clinical picture as per the recommendation of Neurosurgeon/Oncologist. Anti-epileptic (AED) medication to be commenced when patient presents with seizures secondary to intrinsic brain tumour.
Edinburgh Cancer Centre Policy for Steroid Use in Patients with Symptomatic Brain Metastases

Histologically confirmed solid cancer outside CNS + radiological diagnosis of single or multiple CNS metastases

Symptoms related to oedema and mass effect. Start patients with seizures on an anti-convulsant e.g. carbamazepine or levetiracetam

- None
  - No requirement for steroids
  - Reduce dexamethasone dose gradually to zero (see Table 1)
  - Deterioration in neurological function at any time
  - Increase dexamethasone dose temporarily then re-start dose reduction

- Mild
  - Dexamethasone 4 mg/day
  - Reduce dexamethasone dose gradually to zero (see Table 1)
  - Deterioration in neurological function at any time
  - Increase dexamethasone dose temporarily then re-start dose reduction

- Moderate with evidence of midline shift > 5mm
  - Dexamethasone 8 mg/day
  - Reduce dexamethasone dose gradually to zero (see Table 1)
  - Deterioration in neurological function at any time
  - Increase dexamethasone dose temporarily then re-start dose reduction

- Severe with evidence of coning on imaging
  - Dexamethasone 16 mg/day
  - Admit for iv dexamethasone/mannitol if indicated

Table 2 - Good Prescribing Practice for Corticosteroids

1. Document indication for the corticosteroid on the patient’s kardex and in notes
2. Indicate length of steroid course required on kardex and in notes
3. Consider prophylaxis with a PPI with high doses corticosteroids. Ensure this is stopped 7 days after steroids if no ongoing GI symptoms
4. Ensure appropriate patient information regarding corticosteroids and dose reduction regimen on discharge. Counsel if necessary.
5. Monitor all patients on high dose steroids for:
   - Diabetes (daily BM or random Gt)
   - Dyspepsia/epigastric pain
   - Mania/hypomania/psychosis

Table 1

<table>
<thead>
<tr>
<th>Day</th>
<th>Mild symptoms</th>
<th>Moderate symptoms</th>
<th>Severe symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dexamethasone daily dose (doses 8mg and below can be taken as once daily or split doses)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-7</td>
<td>4mg</td>
<td>8mg</td>
<td>16mg</td>
</tr>
<tr>
<td>8-12</td>
<td>3mg</td>
<td>6mg</td>
<td>12mg</td>
</tr>
<tr>
<td>13-17</td>
<td>2mg</td>
<td>4mg</td>
<td>8mg</td>
</tr>
<tr>
<td>18-22</td>
<td>Stop*</td>
<td>2mg</td>
<td>4mg</td>
</tr>
<tr>
<td>23-27</td>
<td>Stop</td>
<td>1mg*</td>
<td>2mg</td>
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<tr>
<td>28-35</td>
<td>Stop</td>
<td>Stop*</td>
<td>1mg*</td>
</tr>
<tr>
<td>35+</td>
<td>Stop</td>
<td>Stop*</td>
<td></td>
</tr>
</tbody>
</table>

* Some patients, especially those on steroids >21 days, will need 1.5mg for 7 days, then 1mg, then 500mg (0.5mg) and then stop, if extreme fatigue on stopping from 500mg, then consider 2mg prednisolone then 1mg prednisolone


File Name: Steroids brain mets
Implementation date: 26/07/10
Issue No: 1
Authorised by: SCE and CTAC
Last Reviewed by CTAC: 26/07/10
Next review due: 26/07/12
Method - defining local policy

• Need to assess doctor’s current practice and knowledge.

• Compare to an ‘expert cohort’.

• Use results:
  ▫ need for quality improvement
  ▫ ‘issues’ with current practice
  ▫ Develop an ‘intervention’
  ▫ Target the intervention appropriately
Data Collection / Results
Managing acute neuro-oncological presentations: an interactive survey.

Intracranial tumours can present in a number of ways, e.g. headache, seizures, new neurology and falling GCS.

Patients with both established and new diagnoses of CNS malignancy will often present to ‘front door’ services.

Management in an acute care setting can often be challenging, and confidence amongst doctors can be variable.

The purpose of this survey is to assess doctors’ confidence in approaching neuro-oncological presentations, with a view to assisting non-specialists.
A bit about you...

By Dr Chris Speakman

Clinical Development Fellow, Edinburgh Cancer for Neuro-Oncology (ECNO)

To which specialty do you belong?
Choose

What is your current grade?
Select the closest match if not present
Choose

Are you aware of any relevant guidelines regarding the management of Neuro-oncological presentations?

☐ Yes
☐ No
Results and Analysis

- Interviewed 105 doctors across NHS Lothian
  - 28 specialists
  - 77 Non-specialists – 31FYs, 21 Middle Grades, 4 ST5+, 21 Cons

Specialist input

- Neurology: 48%
- Neurosurgery: 15%
- Oncology: 7%
- Neuroradiology: 7%

Non-specialists interviewed

- Emergency Medicine: 65%
- General Medicine: 24%
- Oncology: 3%
- Neurology: 1%
- Neurosurgery: 1%
Awareness of relevant guidelines amongst non-specialists

- Yes: 38%
- No: 50%
- Not answered: 12%
Managing acute neuro-oncological presentations: an interactive survey.

How confident would you feel managing a patient presenting with a brain tumour?

1.) Not at all confident – I have no relevant knowledge and would not know how to manage the patient beyond initial resuscitation.

2.) Not very confident – I have a little relevant knowledge, but I would feel uncomfortable commencing any form of treatment beyond initial resuscitation by myself.

3.) Somewhat confident – I have some relevant knowledge, and could commence some form of treatment beyond initial resuscitation independently.

4.) Confident – I have relevant and up-to-date knowledge, and could implement an appropriate initial management plan independently.

5.) Very Confident – I have expert knowledge and could commence a ‘gold-standard’ management plan and advise others who are less confident.

Using the above scale, please rate your confidence:

Not at all confident  1  2  3  4  5  Very confident

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Pre-test confidence

**Graph showing distribution of self-reported confidence ratings amongst specialist and non-specialist groups**

- **Cohort**
  - Specialist
  - Non-specialist

**Chi-Square Tests**

<table>
<thead>
<tr>
<th>Test</th>
<th>Value</th>
<th>df</th>
<th>Asymptotic Significance (2-sided)</th>
</tr>
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<tr>
<td>Pearson Chi-Square</td>
<td>38.101a</td>
<td>4</td>
<td>.000</td>
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<tr>
<td>Likelihood Ratio</td>
<td>34.388</td>
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<td>.000</td>
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<tr>
<td>Linear-by-Linear Association</td>
<td>32.119</td>
<td>1</td>
<td>.000</td>
</tr>
<tr>
<td>N of Valid Cases</td>
<td>95</td>
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<td></td>
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- 4 cells (40.0%) have expected count less than 5. The minimum expected count is .76.
A 55 year old male, previously fit and well is brought in by ambulance after a collapse at home. His wife describes a series of generalised seizures that each lasted several minutes. In the department he is very drowsy but rousable (E4V4M6), and whilst examining him he has a further generalised seizure. After stabilising him and successfully terminating his seizure with IV benzodiazepines, you send him for a CT head scan.

The results of the scan and a provisional report are shown below. MRI shows enhancement of the lesion, in keeping with a high grade tumour.

**Contrast CT Head**

---

**Provisional Report:** Space occupying lesion with significant oedema in the right temporal lobe, probably representing a high grade glioma. 2-3mm midline shift.
What initial management would you instigate?

- No acute management required
- Commence 16mg Dexamethasone
- Commence 8mg Dexamethasone
- Commence 4mg Dexamethasone
- Commence 8mg Dexamethasone and Levetiracetam (Keppra)
- Commence Levetiracetam (Keppra)
- Commence Sodium Valproate (Epilim)
- Commence 16mg Dexamethasone and emergency referral to Neurosurgery for consideration for decompression
- Commence 16mg Dexamethasone and Levetiracetam (Keppra)
Summary of data analysis

Graph comparing responses of specialist and non-specialist groups to Case 1: Medical Management

Chi-Square Tests

<table>
<thead>
<tr>
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<th>Value</th>
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<th>Asymptotic Significance (2-sided)</th>
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<tbody>
<tr>
<td>Pearson Chi-Square</td>
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<td>5</td>
<td>.102</td>
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<tr>
<td>Likelihood Ratio</td>
<td>9.605</td>
<td>5</td>
<td>.087</td>
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<tr>
<td>N of Valid Cases</td>
<td>104</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. 5 cells (41.7%) have expected count less than 5. The minimum expected count is .52.
To whom, and how quickly, would you refer this patient?

- Refer back to GP
- Routine referral to ECNO Team (< 2 weeks)
- Urgent (same day) referral to Neurosurgery
- Urgent (same day) referral to Neurology
- Urgent (same day) referral to Oncology
- Emergency (immediate / overnight) referral to Neurosurgery
Graph comparing responses of specialist and non-specialist groups to Case 1: Referral Strategy

Chi-Square Tests

<table>
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<td>Pearson Chi-Square</td>
<td>24.764*</td>
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<td>.000</td>
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<tr>
<td>Likelihood Ratio</td>
<td>27.200</td>
<td>6</td>
<td>.000</td>
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</table>

*N of Valid Cases: 105

a. 9 cells (64.3%) have expected count less than 5. The minimum expected count is .27.
A 24 year old female, with a previous DVT following a long haul flight (currently on warfarin), presents overnight following a head injury whilst out with friends. A friend reports she tripped over the curb and hit her on the ground. There was a brief initial loss of consciousness, with no reported seizure activity. Her neurological examination is unremarkable, and her GCS is now 15. You decided to perform a CT head given her history (scan and report below).

The results of the scan and a provisional report are shown below. MRI shows a non-enhancing lesion, most likely a low grade tumour.

CT Head with contrast
Graph comparing responses of specialist and non-specialist groups to Case 2: Medical Management

Chi-Square Tests

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<td>Pearson Chi-Square</td>
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<tr>
<td>Likelihood Ratio</td>
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<td>.780</td>
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<tr>
<td>N of Valid Cases</td>
<td>102</td>
<td></td>
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a. 11 cells (78.6%) have expected count less than 5. The minimum expected count is .27.
Graph comparing responses of specialist and non-specialist groups to Case 2: Referral Strategy

Chi-Square Tests

<table>
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<td>Pearson Chi-Square</td>
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<td>.018</td>
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<tr>
<td>Likelihood Ratio</td>
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<td>.001</td>
</tr>
<tr>
<td>N of Valid Cases</td>
<td>104</td>
<td></td>
<td></td>
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</tbody>
</table>

a. 6 cells (50.0%) have expected count less than 5. The minimum expected count is .27.
A 45 year old man, with a background of renal cell carcinoma currently treated curatively with nephrectomy 4 years ago, is brought in by ambulance after being found unconscious and covered in vomit at home. His partner states he has been complaining of a worsening headache with associated nausea for the last two weeks. On examination he has marked weakness of his left side, inferolateral displacement of the right eye, and a dilated right pupil. After stabilising him you send him for a CT head scan. What is the most appropriate course of action?

The results of the scan and a provisional report are shown below.

CT Head with contrast

Provisional Report: Large space occupying lesion with significant pressure effect. There is 6mm mid-line shift with associated uncal herniation. Differential includes metastatic disease recurrence, or high grade glioma. No focal infarct or haemorrhage.
Graph comparing responses of specialist and non specialist groups to Case 3: Medical Management

Case 3a:
- Commence 16mg Dexamethasone and emergency referral to Neurosurgery for decompression
- Commence 16mg Dexamethasone
- Commence 16mg Dexamethasone and Levetiracetam (Keppra)
- Commence 8mg Dexamethasone
- Commence 8mg Dexamethasone and Levetiracetam (Keppra)
- Commence Levetiracetam (Keppra)
- No acute management required

Chi-Square Tests

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>df</th>
<th>Asymptotic Significance (2-sided)</th>
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</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>8.517&lt;sup&gt;a&lt;/sup&gt;</td>
<td>6</td>
<td>.203</td>
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<tr>
<td>Likelihood Ratio</td>
<td>8.367</td>
<td>6</td>
<td>.212</td>
</tr>
<tr>
<td>N of Valid Cases</td>
<td>104</td>
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</table>

<sup>a</sup> 11 cells (78.6%) have expected count less than 5. The minimum expected count is .27.
Graph comparing responses of specialist and non specialist groups to Case 3:
Referral Strategy

Chi-Square Tests

<table>
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<td>Pearson Chi-Square</td>
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<td>3</td>
<td>.117</td>
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<tr>
<td>Likelihood Ratio</td>
<td>6.570</td>
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<td>.087</td>
</tr>
<tr>
<td>N of Valid Cases</td>
<td>104</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. 4 cells (50.0%) have expected count less than 5. The minimum expected count is .27.
Managing acute neuro-oncological presentations: an interactive survey.

How can we help?

How can the Edinburgh Centre for Neuro-oncology (ECNO) Team help improve your confidence in managing these situations?

- Publication of guidance on the intranet
- Publication of guidance with posters
- Teaching programme
- Other: 

[Bar progress: 100%] 100%: You made it.

Never submit passwords through Google Forms.
Suggested intervention

- Teaching: 35%
- New guidelines: 34%
- Posters: 22%
- Direct specialty input/takeover: 1%
- SPA: 1%
- Add chapter to emibank / AEH: 1%
- Pathway: 1%
- Podcasts: 1%
- Email: 1%
- Easier navigation of guidelines: 1%
Data inferences

- Expectedly lower non-specialist confidence scores
  - Significant differences between the cohorts

- Little awareness of guidelines
  - 50% unaware
    - Limited available information
    - Difficult to access on the intranet

- Medical management on the whole done well
  - Few statistically significant differences between cohorts
    - Certain cases much clearer cut
    - Variation greater in the non-specialist group

- ‘System’ decisions rather than ‘Medical Decisions’ more divisive.
Developing Guidance

- User-friendly
- Easily disseminated amongst target groups
- Address clinical scenarios with a number of variables
- Easy to follow, evidence based medical management
- Clearly sign-posted referral strategy

- Acceptable to a wide range of specialists

- Complementary to the latest “Brain Tumour Pathway 2016” MSN for Neurosurgery
Escalate management if ANY qualifying feature manifests at any point.
Discussion

• So far well received
• Drafts reviewed and revisions guided by Oncology and Neurosciences Consultants
• Out for consultation with stakeholder teams

• Submitted for inclusion in Adult Emergencies Handbook / EMIBank
Next Steps: An improvement?

- Secondary survey currently in progress
- To be run with new guidance available
Questions
References


References

- (33) Steroids in neurooncology: actions, indications, side-effects Patrick Roth, Wolfgang Wick and Michael Weller