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| Medtech – Information Management services |
| Pediatric Digital Teaching Files |
| A night time disturbance |
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| **Module #3** |
| **eLearning Storyboard Beta 20130331** |
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| **Document History** | | |
| **Version** | **Date** | **Description** |
| Alpha | 2013-XX-XX | First draft for review by subject matter experts. Please confirm the accuracy, appropriateness and completeness of the content, as well as the level of detail of material and degree of difficulty for the target audience. |
| Beta |  | Revised draft for review by subject matter experts to confirm changes |
| Final |  | Final version for approval |
| Production |  | Approved storyboard for production |

**Notes to reviewers**

Each storyboard page generally represents one screen. The tables are designed to limit the amount of text to avoid on-screen scrolling. Keep in mind that the text will be transformed with graphics and interactivity, e.g. three pages of storyboard content may appear on one screen, e.g. a procedure with several steps may be illustrated by an interactive process map where learners mouse-over the step for the explanation.

When reviewing the content, please keep in mind that it has been adapted from its paper-based and/or classroom source for an eLearning format and reading habits. Online text is written, punctuated and formatted differently than paper-based writing, to allow readers to scan information quickly and easily, with more white space, less punctuation and fewer qualifying words (e.g. *the following, below, above*, etc.).

Specifically, our aim is to create scannable text by following Jakob Nielsen’s guidelines for writing for the Web.

* Information should be presented in an **inverted pyramid** style, starting with the conclusion.
* Paragraphs should be converted to bulleted **lists** whenever possible. The list is introduced by a complete sentence with no colon, and is punctuated only if each bullet is a complete sentence.
* **Keywords** are highlighted for emphasis.
* Each page or screen should include a meaningful **sub-topic heading** that summarizes the key message or relevance of the screen.
* The storyboard should feature **half the word count** (or less) than its paper-based source.

We use the *Gage Canadian Dictionary* and *The Canadian Style*for general spelling preferences and stylistic conventions.

**Conventions**

* **Subject matter experts:** Please review white cells only, which contain content that will appear on learners’ screens, i.e. Primary Content and Pop-up Text. Please do not edit the Notes to Developers.
* Please use the *Track Changes* feature to make changes or add comments to the storyboard, but kindly do not rename the document.
* Notes to subject matter experts (SMEs) are indicated in ORANGE. Notes to Developers are indicated in GREEN. Notes to Editors are indicated in BLUE.

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| **Module:** | A night time disturbance | **Screen ID** (module-topic-page #): |
| **Topic:** | Title screen | **03-1** |
| **Sub Topic:** |  |
| **Primary Content:** For SME review | | |
| A night time disturbance  **Erick Sell, MD**  Pediatric Neurologist, Children’s Hospital of Eastern Ontario  Assistant Professor, University of Ottawa    **Tobey Audcent, MD, FRCPC**  Consultant Pediatrician, Children's Hospital of Eastern Ontario  Assistant Professor, University of Ottawa  Peer review by:  **Mary Johnston, CCFP(EM), MCISc**  Emergency Medicine, Children's Hospital of Eastern Ontario  Assistant Professor, University of Ottawa | | |
| **Pop-up Text:** For SME review | | |
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| **Notes to Developers:** For GEVC use only. Please do not edit or translate. | | |
| Notes to reviewers: Text is in orange  Notes to developers: | | |

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| **Module:** | A night time disturbance | **Screen ID** (module-topic-page #): |
| **Topic:** | Patient presentation | **03-2-1** |
| **Sub Topic:** | Patient chart |
| **Primary Content:** For SME review | | |
| **Day 1, 22:00**  [insert Ethan’s chart] | | |
| **Pop-up Text:** For SME review | | |
| **Patient chart**  Patient: Ethan  Chief complaint: Extremity weakness  Age: 7 years  Weight: 25 kg  Vital signs @ triage (Day 1, 21:50):  T: 36.5 po  HR: 95  RR: 17  O2 sat: 98% room air  BP: 110/70 | | |
| **Notes to Developers:** For GEVC use only. Please do not edit or translate. | | |
| Notes to reviewers: Text is in orange  Notes to developers: Show top of chart with info above  The Pocket Card is the same as the bronchiolitis module (module 1 that GEVC programmed) – this will be the same for all the modules | | |

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| **Module:** | A night time disturbance | **Screen ID** (module-topic-page #): |
| **Topic:** | History | **03-2-2** |
| **Sub Topic:** | History of presenting illness |
| **Primary Content:** For SME review | | |
| **Day 1, 22:20**  Mother: “Ethan went to bed at his regular time around 8:30 tonight. Then, about an hour later we heard a gurgling noise coming from his room. We went in to check on him and found him sitting on his bed. He seemed to be awake as his eyes were open but he wouldn’t talk to us. He was drooling and the right-side of his mouth was twitching rhythmically. That lasted for about 10 seconds. We also noticed he wasn’t using his right arm as much as his left, even though he’s right-handed. After about two minutes these symptoms went away and he was back to normal as if nothing had happened. He said he remembered everything that happened. He has never done anything like that before and he is not taking any medications. It was frightening seeing him like that so we drove to the hospital immediately.” | | |
| **Pop-up Text:** For SME review | | |
| **Patient chart**  **Day 1, 22:25**  **MD note**  HPI: Prev well. No reg meds. Well at bedtime 20:30.  ~ 21:30 parents heard gurgling, found sitting in room. Awake but not verbally responsive. Drooling.  Rhythmic movts RT side of mouth x10 secs. Decreased use of RUL. Return to baseline at 2min, no amnesia. | | |
| **Notes to Developers:** For GEVC use only. Please do not edit or translate. | | |
| Notes to reviewers: Text is in orange  Notes to developers: photo of mother | | |

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| **Module:** | A night time disturbance | **Screen ID** (module-topic-page #): |
| **Topic:** | History | **03-3-1** |
| **Sub Topic:** | Initial impression |
| **Primary Content:** For SME review | | |
| **Day 1, 22:20**  Resident [thought bubble]: “What is my differential diagnosis for this episode?”   * Migraine * Parasomnia * Seizure * Stroke * Tic disorder | | |
| **Pop-up Text:** For SME review | | |
| **Feedback for correct answer:**  Correct! The most likely diagnosis is a seizure.  **Feedback for incorrect answer:**  This is not the most likely diagnosis for Ethan. Try again. | | |
| **Notes to Developers:** For GEVC use only. Please do not edit or translate. | | |
| Notes to reviewers: Text is in orange  Notes to developers: Multichoice Q. The correct answer is seizure. Learners cannot move on until they answer this correctly  Program based on 01-4-2 | | |

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| **Module:** | A night time disturbance | **Screen ID** (module-topic-page #): |
| **Topic:** | History | **03-3-2** |
| **Sub Topic:** | Key features |
| **Primary Content:** For SME review | | |
| Attending: “Reflect back on what Ethan’s mother told you. Which of the following is MOST supportive of this episode being a seizure and not one of the other disorders?”   * It happened at night * Ethan could not speak * Ethan's face twitched in a rhythmic manner * Ethan had weakness in his right arm | | |
| **Pop-up Text:** For SME review | | |
| **Feedback**  It happened at night: True seizures occur during wakefulness, as well as at night or during drowsiness. Parasomnias can be confused with epileptic seizures, but parasomnias occur only at night.1  Ethan could not speak: Speech limitations can be seen in complicated migraines or stroke. Migraines can be confused with epileptic seizures.1  Ethan's face twitched in a rhythmic manner: The rhythmic muscular contractions in the mouth are only observed in seizures and are the most suggestive finding in Ethan's presentation.2  Ethan had weakness in his right arm: Limb weakness can occur following cerebrovascular events, migraines, or epileptic seizures. Stroke in childhood often debuts with a focal epileptic seizure almost always involving a limb, given that most strokes in childhood involve the MCA territory. It’s important to determine the timing of the seizure relative to the motor deficit when identifying history. A seizure follows the motor deficit in a stroke, whereas the seizure presents before the motor deficit in Todd’s paralysis. Limb paresis can also be present in complicated migraines.1,3 | | |
| **Notes to Developers:** For GEVC use only. Please do not edit or translate. | | |
| Notes to reviewers: Text is in orange  Notes to developers: Multichoice Q. They must get it right before moving on. Program like 01-4-2.  image of attending | | |

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| **Module:** | A night time disturbance | **Screen ID** (module-topic-page #): |
| **Topic:** | History | **03-4-1** |
| **Sub Topic:** | Definition of seizures |
| **Primary Content:** For SME review | | |
| A seizure is defined as a paroxysmal involuntary disturbance of brain function resulting from excessive and abnormal discharges of cortical neurons.  A diagnosis of *epilepsy* is made after 2 or more unprovoked seizures. | | |
| **Pop-up Text:** For SME review | | |
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| **Notes to Developers:** For GEVC use only. Please do not edit or translate. | | |
| Notes to reviewers: Text is in orange  Notes to developers: Include image of a brain | | |

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| **Module:** | A night time disturbance | **Screen ID** (module-topic-page #): |
| **Topic:** | Physical exam | **03-4-2** |
| **Sub Topic:** | Seizure classification: Case A- step 1 |
| **Primary Content:** For SME review | | |
| *Watch the following video and then identify the seizure type.*  [embed video 21-1]4  Is the seizure *partial* or *generalized*?   * Partial * Generalized | | |
| **Pop-up Text:** For SME review | | |
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| **Notes to Developers:** For GEVC use only. Please do not edit or translate. | | |
| Notes to reviewers: Text is in orange  Notes to developers: Embed video 21-1 on the main screen. m/c Q. Correct answer is generalized. They are given feedback indicating whether they are right or not (use the green check or red cross format) | | |

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| **Module:** | A night time disturbance | **Screen ID** (module-topic-page #): |
| **Topic:** | Physical exam | **03-4-3** |
| **Sub Topic:** | Seizure classification: Case A- step 2 |
| **Primary Content:** For SME review | | |
| *Watch the following video and then identify the seizure type.*  [embed video 21-1]  Is the seizure *convulsive* or *non-convulsive*?   * Convulsive * Non-convulsive | | |
| **Pop-up Text:** For SME review | | |
|  | | |
| **Notes to Developers:** For GEVC use only. Please do not edit or translate. | | |
| Notes to reviewers: Text is in orange  Notes to developers: This is the same screen as 03-4-2 with a different Q. Correct answer is convulsive. | | |

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| **Module:** | A night time disturbance | **Screen ID** (module-topic-page #): |
| **Topic:** | Physical exam | **03-4-4** |
| **Sub Topic:** | Seizure Classification: Case A - step 3 |
| **Primary Content:** For SME review | | |
| *Watch the following video and then identify the seizure type.*  [embed video 21-1]  What is the type of seizure observed in the video?   * Tonic-clonic * Myoclonic * Atonic * Tonic * Clonic * Spasms | | |
| **Pop-up Text:** For SME review | | |
| **Feedback**  This is a generalized tonic-clonic seizure.  “[This] 40-year-old male presents with sudden scream with bilateral axial flexion with an internal rotation of both upper limbs. A slight non-forced rotation of the head to the right is then followed by a clonic phase. A second tonic phase occurs 55 seconds after seizure onset, followed by bilateral clonic jerks, stertor, postictal headache, and limb stiffness. [You can see] generalized tonic posturing with bilateral arm extension or flexion, followed by rhythmic flexion movements, at the beginning vibratory and later on slower in frequency until stopping”.4  For a summary of seizure types, click here. | | |
| **Notes to Developers:** For GEVC use only. Please do not edit or translate. | | |
| Notes to reviewers: Text is in orange  Notes to developers: This is the same screen as 03-4-2 with a different Q. Correct answer is tonic-clonic  If possible, have the video still available with the feedback  Link here [in the feedback] to Seizure Type figure (see end of doc) | | |

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| **Module:** | A night time disturbance | **Screen ID** (module-topic-page #): |
| **Topic:** | Physical exam | **03-4-5** |
| **Sub Topic:** | Seizure classification: Case B - step 1 |
| **Primary Content:** For SME review | | |
| *Watch the following video and then identify the seizure type.*  [embed video 17-1]4  Is the seizure *partial* or *generalized*?   * Partial * Generalized | | |
| **Pop-up Text:** For SME review | | |
|  | | |
| **Notes to Developers:** For GEVC use only. Please do not edit or translate. | | |
| Notes to reviewers: Text is in orange  Notes to developers: Embed video 17-1 on the main screen. m/c Q. Correct answer is generalized. They are given feedback indicating whether they are right or not (use the green check or red cross format) | | |

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| **Module:** | A night time disturbance | **Screen ID** (module-topic-page #): |
| **Topic:** | Physical exam | **03-4-6** |
| **Sub Topic:** | Seizure classification: Case B - step 2 |
| **Primary Content:** For SME review | | |
| *Watch the following video and then identify the seizure type.*  [embed video 17-1]  Is the seizure *convulsive* or *non-convulsive*?   * Convulsive * Non-convulsive | | |
| **Pop-up Text:** For SME review | | |
| **Feedback**  This is an absence seizure.  “[This] 4-year-old girl stops singing, loses contact, then resumes contact and singing. Staring and unresponsiveness for seconds, accompanied by subtle mouthing movements or eye flutter, are typical in childhood absence epilepsy”.4  For a summary of seizure types, click here. | | |
| **Notes to Developers:** For GEVC use only. Please do not edit or translate. | | |
| Notes to reviewers: Text is in orange  Notes to developers: This is the same screen as 03-4-5 with a different Q. Correct answer is non-convulsive.  If possible, have the video still available with the feedback  Link here [in the feedback] to Seizure Type figure (see end of doc) | | |

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| **Module:** | A night time disturbance | **Screen ID** (module-topic-page #): |
| **Topic:** | Physical exam | **03-4-7** |
| **Sub Topic:** | Seizure classification: Case C- step 1 |
| **Primary Content:** For SME review | | |
| *Watch the following video and then identify the seizure type.*  [embed video 29-1]4  Is the seizure *partial* or *generalized*?   * Partial * Generalized | | |
| **Pop-up Text:** For SME review | | |
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| **Notes to Developers:** For GEVC use only. Please do not edit or translate. | | |
| Notes to reviewers: Text is in orange  Notes to developers: Embed video 29-1 on the main screen. m/c Q. Correct answer is partial. They are given feedback indicating whether they are right or not (use the green check or red cross format) | | |

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| **Module:** | A night time disturbance | **Screen ID** (module-topic-page #): |
| **Topic:** | Physical exam | **03-4-8** |
| **Sub Topic:** | Seizure classification: Case C-step 2 |
| **Primary Content:** For SME review | | |
| *Watch the following video and then identify the seizure type.*  [embed video 29-1]  Is the seizure *simple* or *complex*?   * Simple * Complex | | |
| **Pop-up Text:** For SME review | | |
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| **Notes to Developers:** For GEVC use only. Please do not edit or translate. | | |
| Notes to reviewers: Text is in orange  Notes to developers: This is the same screen as 03-4-7 with a different Q. Correct answer is simple. | | |

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| **Module:** | A night time disturbance | **Screen ID** (module-topic-page #): |
| **Topic:** | Physical exam | **03-4-9** |
| **Sub Topic:** | Seizure classification: Case C - step 3 |
| **Primary Content:** For SME review | | |
| *Watch the following video and then identify the seizure type.*  [embed video 29-1]  What is the type of seizure observed in the video?   * Motor * Sensory (auras) * Autonomic * Psychic (auras) | | |
| **Pop-up Text:** For SME review | | |
| **Feedback**  This is a partial motor seizure (left temporal lobe onset epileptic seizure).  “[This] 5-year-old boy opens his eyes and suddenly presents a tonic contraction of the right arm, later associated with a few clonic jerks, with pedaling and gyration towards the left”.4  For a summary of seizure types, click here. | | |
| **Notes to Developers:** For GEVC use only. Please do not edit or translate. | | |
| Notes to reviewers: Text is in orange  Notes to developers: This is the same screen as 03-4-8 with a different Q. Correct answer is motor  If possible, have the video still available with the feedback  Link here [in the feedback] to Seizure Type figure (see end of doc) | | |

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| **Module:** | A night time disturbance | **Screen ID** (module-topic-page #): |
| **Topic:** | Physical exam | **03-4-10** |
| **Sub Topic:** | Seizure classification: Case D- step 1 |
| **Primary Content:** For SME review | | |
| *Watch the following video and then identify the seizure type.*  [embed video 15-1]4  Is the seizure *partial* or *generalized*?   * Partial * Generalized | | |
| **Pop-up Text:** For SME review | | |
|  | | |
| **Notes to Developers:** For GEVC use only. Please do not edit or translate. | | |
| Notes to reviewers: Text is in orange  Notes to developers: Embed video 15-1 on the main screen. m/c Q. Correct answer is partial. They are given feedback indicating whether they are right or not (use the green check or red cross format) | | |

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| **Module:** | A night time disturbance | **Screen ID** (module-topic-page #): |
| **Topic:** | Physical exam | **03-4-11** |
| **Sub Topic:** | Seizure classification: Case D - step 2 |
| **Primary Content:** For SME review | | |
| *Watch the following video and then identify the seizure type.*  [embed video 15-1]  Is the seizure *simple* or *complex*?   * Simple * Complex | | |
| **Pop-up Text:** For SME review | | |
|  | | |
| **Notes to Developers:** For GEVC use only. Please do not edit or translate. | | |
| Notes to reviewers: Text is in orange  Notes to developers: This is the same screen as 03-4-10 with a different Q. Correct answer is simple. | | |

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| **Module:** | A night time disturbance | **Screen ID** (module-topic-page #): |
| **Topic:** | Physical exam | **03-4-12** |
| **Sub Topic:** | Seizure classification: Case D-step 3 |
| **Primary Content:** For SME review | | |
| *Watch the following video and then identify the seizure type.*  [embed video 15-1]  What is the type of seizure observed in the video?   * Motor * Sensory (auras) * Autonomic * Psychic (auras) | | |
| **Pop-up Text:** For SME review | | |
| **Feedback**  This is a partial motor seizure (epilepsy with C-T spikes left simple partial hemifacial seizure at awakening).  “Seizure in an 8-year-old boy which begins with a tonic left deviation of the tongue and mouth, followed by left hemifacial jerks, hypersalivation, drooling, and inability to speak during the ictal phase”.4  For a summary of seizure types, click here. | | |
| **Notes to Developers:** For GEVC use only. Please do not edit or translate. | | |
| Notes to reviewers: Text is in orange  Notes to developers: This is the same screen as 03-4-10 with a different Q. Correct answer is motor  If possible, have the video still available with the feedback  Link here [in the feedback] to Seizure Type figure (see end of doc) | | |

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| **Module:** | A night time disturbance | **Screen ID** (module-topic-page #): |
| **Topic:** | Physical exam | **03-4-13** |
| **Sub Topic:** | Seizure classification: Case E- step 1 |
| **Primary Content:** For SME review | | |
| *Watch the following video and then identify the seizure type.*  [embed video 9-1]4  Is the seizure *partial* or *generalized*?   * Partial * Generalized | | |
| **Pop-up Text:** For SME review | | |
|  | | |
| **Notes to Developers:** For GEVC use only. Please do not edit or translate. | | |
| Notes to reviewers: Text is in orange  Notes to developers: Embed video 9-1 on the main screen. m/c Q. Correct answer is generalized. They are given feedback indicating whether they are right or not (use the green check or red cross format) | | |

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| **Module:** | A night time disturbance | **Screen ID** (module-topic-page #): |
| **Topic:** | Physical exam | **03-4-14** |
| **Sub Topic:** | Seizure classification: Case E- step 2 |
| **Primary Content:** For SME review | | |
| *Watch the following video and then identify the seizure type.*  [embed video 9-1]  Is the seizure *convulsive* or *non-convulsive*?   * Convulsive * Non-convulsive | | |
| **Pop-up Text:** For SME review | | |
|  | | |
| **Notes to Developers:** For GEVC use only. Please do not edit or translate. | | |
| Notes to reviewers: Text is in orange  Notes to developers: This is the same screen as 03-4-2 with a different Q. Correct answer is convulsive. | | |

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| **Module:** | A night time disturbance | **Screen ID** (module-topic-page #): |
| **Topic:** | Physical exam | **03-4-15** |
| **Sub Topic:** | Seizure Classification: Case E - step 3 |
| **Primary Content:** For SME review | | |
| *Watch the following video and then identify the seizure type.*  [embed video 9-1]  What is the type of seizure observed in the video?   * Tonic-clonic * Myoclonic * Atonic * Tonic * Clonic * Spasms | | |
| **Pop-up Text:** For SME review | | |
| **Feedback**  This is an infantile spasm.  “[This] 6-month-old diagnosed with West syndrome, with cluster of spasms. Flexion of the legs is immediately followed by extension-abduction of the arms.”4  For a summary of seizure types, click here. | | |
| **Notes to Developers:** For GEVC use only. Please do not edit or translate. | | |
| Notes to reviewers: Text is in orange  Notes to developers: This is the same screen as 03-4-2 with a different Q. Correct answer is tonic-clonic  If possible, have the video still available with the feedback  Link here [in the feedback] to Seizure Type figure (see end of doc) | | |

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| **Module:** | A night time disturbance | **Screen ID** (module-topic-page #): |
| **Topic:** | Physical exam | **03-5-1** |
| **Sub Topic:** | Neurologic exam |
| **Primary Content:** For SME review | | |
| **Day 1, 22:30**  The physical examination, including a complete neurologic exam, is unremarkable.  You are called away to help with another patient in resuscitation. | | |
| **Pop-up Text:** For SME review | | |
| Stat call for doctor to room 6. | | |
| **Notes to Developers:** For GEVC use only. Please do not edit or translate. | | |
| Notes to reviewers: Text is in orange  Notes to developers: Design a clock that fits with the look and feel of the module and that shows 22:30.  When the learner clicks Next, start the “animation”. The animation is simply a new screen appearing every second that shows 1/4 hr has passed on the clock.  Show the time passing to 23:45.  Once the clock gets to 23.45 add the following text on the screen: “Stat call for doctor to room 6. Resident thought: That’s Ethan’s room! He may be having another seizure.” | | |

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| **Module:** | A night time disturbance | **Screen ID** (module-topic-page #): |
| **Topic:** | Initial management | **03-5-2** |
| **Sub Topic:** | Acute seizure management |
| **Primary Content:** For SME review | | |
| **Day 1, 23:45**  Resident thought: “What are the steps for managing an acute seizure episode? What will be my first actions when I arrive?”  *In the box below, list the first 4 non-pharmacological steps you would take to immediately manage an acute seizure episode in this patient.* | | |
| **Pop-up Text:** For SME review | | |
| ***Feedback***   1. A = Support his airway 2. B = 100% oxygen, O2 sat monitor 3. C = Monitor (record vital signs including HR and BP) 4. D = Glucose. Blood glucose level is sometimes referred to as the “6th vital sign” in a patient presenting with seizures5   **Patient Chart**  **Day 1, 23:47**  **RN note**  ~ 2min seizure episode witnessed. Twitching L side of face, initial rhythmic jerking movt’s left arm, then jerking movements of entire body.MD paged stat.  **Day 1 23:52**  **RN note**  MD arrived. Pt placed on monitor, Fi02 100% via face mask.  T: 36.5ax  HR: 115  RR: 15 irregular, airway patent  O2 sat: 100% room air (FiO2 100% NRB)  BP: 120/75  Bedside glucose: 5.5 mmol/L | | |
| **Notes to Developers:** For GEVC use only. Please do not edit or translate. | | |
| Notes to reviewers: Text is in orange  Notes to developers: Add image of resident , a corridor or room door. Insert text box and Check Answer button. Then provide the feedback above | | |

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| **Module:** | A night time disturbance | **Screen ID** (module-topic-page #): |
| **Topic:** | Initial management | **03-5-3** |
| **Sub Topic:** | Vital signs during a seizure |
| **Primary Content:** For SME review | | |
| **Day 1, 23:50**  Resident thought: “What changes in vital signs would I expect to see during a seizure?” | | |
| **Pop-up Text:** For SME review | | |
| **Feedback**  For most, but not all, seizures increased heart rate, apnea, or erratic breathing are seen. There are rare cases of ictal (seizure driven) asystole when seizures originate in the insula.  Bradycardia and normal heart rate are very rare during a seizure, even if there are no convulsive movements.  Post-seizure, breathing frequency and heart rate usually normalize within a minute. If it has been more than a couple of minutes since the seizure and the heart rate is still elevated, consider an underlying condition (fever, dehydration, combative state) or—much less common—persistence of subtle seizure activity or subclinical seizure activity. | | |
| **Notes to Developers:** For GEVC use only. Please do not edit or translate. | | |
| Notes to reviewers: Text is in orange  Notes to developers: Open text box with Check Answer button. Provide feedback when clicked | | |

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| **Module:** | A night time disturbance | **Screen ID** (module-topic-page #): |
| **Topic:** | Initial management | **03-5-4** |
| **Sub Topic:** | Vital signs interpretation |
| **Primary Content:** For SME review | | |
| **Day 1, 23:50**  Resident thought: “Are Ethan’s vital signs normal?”   |  |  |  | | --- | --- | --- | |  | **Normal** | **Abnormal** | | Temperature | X |  | | Heart rate |  | X | | Respiratory rate |  | X | | O2 saturation | X |  | | Blood pressure | X |  | | | |
| **Pop-up Text:** For SME review | | |
| Hint: You can access Ethan’s vital signs from the Patient Chart | | |
| **Notes to Developers:** For GEVC use only. Please do not edit or translate. | | |
| Notes to reviewers: Text is in orange  Notes to developers: Add a Hint popup: You can access Ethan’s vital signs from the Patient Chart  Program same as 02-2-2  Add info to patient chart | | |

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| **Module:** | A night time disturbance | **Screen ID** (module-topic-page #): |
| **Topic:** | Initial management | **03-5-5** |
| **Sub Topic:** | Assessing the seizure |
| **Primary Content:** For SME review | | |
| **Day 1, 23:55**  Nurse: “Ethan was asleep, and then I noticed that he was having another seizure. The left side of his face was twitching; he was drooling and making gurgling noises. His left arm was jerking rhythmically. Then, his whole body was jerking. That lasted for about 5 seconds. Then, the jerking slowed down and finally stopped. The entire episode lasted about two minutes.”  *Could Ethan be having febrile seizures?*   * Yes * No | | |
| **Pop-up Text:** For SME review | | |
| **Patient chart**  MD note:  2 min Left sided focal seizure with secondary generalization witnessed by RN. (See RN note). Now resolved. Normal bedside glucose.  O/E GCS 15, looks tired, pale. PERL, normal fundi, neck supple. CN II-XII normal. CN I not tested. Reflexes equal U/L bilat. Strength 4/5 LUL, all other equal 5/5. Normal tone. Plantars downgoing.  Chest clear. S1 & S2 no XS/mm. CR brisk. Addo soft, non-tender. No rashes. | | |
| **Notes to Developers:** For GEVC use only. Please do not edit or translate. | | |
| Notes to reviewers: Text is in orange  Notes to developers: correct answer is No. Let learner know if correct or not using check or cross  Add info to patient chart | | |

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| **Module:** | A night time disturbance | **Screen ID** (module-topic-page #): |
| **Topic:** | Initial management | **03-5-6** |
| **Sub Topic:** | Febrile seizures |
| **Primary Content:** For SME review | | |
| **Day 1, 23:55**  Attending: “List three things that tell you this is not a febrile seizure?” | | |
| **Pop-up Text:** For SME review | | |
| **Feedback**   1. **Ethan’s age**: Febrile seizures are a common cause of convulsions in young children, occurring in approximately 5% of children <5yo with the peak age being 12-18 months. Although reported in children over age 6, febrile seizures would be considered a diagnosis of exclusion in this age group.6 2. **Absence of fever**: Diagnostic criteria for a febrile seizure include a temperature above 38.0oC, age <6yo, and the absence of evidence of CNS infection, inflammation, or an acute systemic metabolic abnormality. There should also be no history of previous afebrile seizures.6 3. **Focal seizure**: Febrile seizures have no focal features. Generalized seizures are mainly clonic, but atonic and tonic spells are also possible.   Simple febrile seizures are the most common type. Individual seizures are less than 15 minutes in duration and a series of seizures would be less than 30 minutes total duration. Complex febrile seizures are rare, may have multiple episodes within 24 hours, present with focal features, and last longer than 15 minutes.6 | | |
| **Notes to Developers:** For GEVC use only. Please do not edit or translate. | | |
| Notes to reviewers: Text is in orange  Notes to developers: Insert text box and Check Answer button. Provide feedback when checked | | |

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| **Module:** | A night time disturbance | **Screen ID** (module-topic-page #): |
| **Topic:** | Initial management | **03-5-7** |
| **Sub Topic:** | Medications |
| **Primary Content:** For SME review | | |
| **Day 2, 00:00**  Nurse: “Do you want to order any medication for Ethan? He doesn’t have IV access.”  *In the box below, list the name, dose, and route of two medications you could administer in this situation.* | | |
| **Pop-up Text:** For SME review | | |
| ***Feedback***  Seizures are treated acutely if they last more than 3-5 minutes.  By convention, more than 5 minutes of convulsive epileptic seizures is considered “convulsive status epilepticus” and should be prevented given the risks of neuronal damage. Single seizures (not status epilepticus) have not been associated with neuronal damage. Therefore, there is no need to treat once the seizure has stopped.  Lorazepam: 0.1 mg/kg buccal/pr (max 4mg/dose)  Midazolam: 0.5 mg/kg buccal (max 10 mg/dose)  0.2 mg/kg intranasal (max 5 mg/nostril/dose)  Diazepam: 0.5 mg/kg PR(max 20 mg/dose)  If an IV is present:  Lorazepam: 0.1 mg/kg IV (max 4mg/dose) – administer over 30-60 seconds slow push to minimize risk of respiratory depression  Midazolam: 0.1 mg/kg IV (max 10mg/dose)  (Canadian Pediatric Society position statement)5,7-8 | | |
| **Notes to Developers:** For GEVC use only. Please do not edit or translate. | | |
| Notes to reviewers: Text is in orange  Notes to developers: Insert text box and Check Answer button. Then provide feedback | | |

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| **Module:** | A night time disturbance | **Screen ID** (module-topic-page #): |
| **Topic:** | Diagnosis | **03-5-8** |
| **Sub Topic:** | Investigations |
| **Primary Content:** For SME review | | |
| **Day 2, 00.05**  [Resident thought]: “What investigations should I order?”  *In the box below, list the investigations you would order immediately.* | | |
| **Pop-up Text:** For SME review | | |
| **Feedback**  Consider: electrolytes, glucose, venous blood gas  Depending on clinical history consider: CBC/diff, anticonvulsant levels, liver function, toxicology screen, metabolic screen, blood cultures, calcium  (Canadian Pediatric Society position statement)5  **Patient Chart:**  **Labs:** CBC & diff, lytes, glucose, VBG, Ca+2 normal | | |
| **Notes to Developers:** For GEVC use only. Please do not edit or translate. | | |
| Notes to reviewers: Text is in orange  Notes to developers: Insert text box and Check Answer button. Provide feedback when clicked | | |

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| **Module:** | A night time disturbance | **Screen ID** (module-topic-page #): |
| **Topic:** | Diagnosis | **03-6-1** |
| **Sub Topic:** | Differential diagnosis |
| **Primary Content:** For SME review | | |
| **Day 2, 00:20**  Mother: “We are very worried that something serious is wrong with Ethan, especially since his one arm seems to be weak. Could he have a brain tumour?”  *Which of the following conditions could present in this way?*   * Seizure disorder * Cerebrovascular disease (e.g., Stroke, TIA) * Head injury * Brain tumour * Metabolic disease * Hemiplegic migraines or complicated migraines * Encephalitis * Parasomnias | | |
| **Pop-up Text:** For SME review | | |
| ***Feedback***  Seizure disorder: Epileptic seizures can present during sleep and may sometimes leave a transient motor deficit known as Todd’s paralysis or post-ictal paresis. This should resolve within a few hours and, by definition, within 24 hours. Many childhood epileptic syndromes are inherited. However, the genetics of epilepsy are complex and multigenic and therefore there is often no family history of epilepsy in first degree relatives. Patients are often otherwise healthy and their developmental and cognitive functions are normal, although neuropsychiatric and behavioural comorbidities are common.  Cerebrovascular disease (e.g., Stroke, TIA): Cerebrovascular disease (e.g., stroke, TIA) is unlikely given the resolving deficits, the patient’s age, and a normal physical examination. In a cerebrovascular event, the seizure follows stroke. Conversely, in Todd’s paralysis, a transient focal neurologic deficit follows the seizure. TIAs rarely cause loss of consciousness. Seizures are one of the most common acute signs of acute ischemic stroke but in a stroke an ipsilateral motor deficit should be observed during and after the post-ictal state.  Head injury: A head injury is unlikely as there is no history of trauma and no external sign of injury. Further, seizures in the context of trauma tend to be accompanied by other findings, such as a persistent change in the level of consciousness and/or deficits on the neurological examination.  Brain tumour: A brain tumour is possible. However, seizures rarely present as the first sign; changes in behaviour, cranial nerves, and motor deficits tend to precede seizures.  Metabolic disease: A new diagnosis of an inborn error of metabolism in this age is less likely in the absence of a history of previous episodes. However, a toxic ingestion can present with seizures.  Hemiplegic migraines or complicated migraines: Migraines rarely present with paresis or confusion without the headache component. Similarities between focal seizures and migraines are that both can have symptoms that “march”. However, migraine symptoms tend to evolve over minutes, whereas seizure symptoms evolve over seconds. Loss of consciousness is rare with migraines (the exception can be with basilar migraines). As well, complicated migraines almost never present from sleep in childhood.  Encephalitis: Encephalitis with absence of fever and complete resolution of symptoms in-between seizures is very rare in childhood. Commonly, children have fever, headache, disorientation/confusion, and/or personality changes. They may even be persistently drowsy. However, the absence of fever or signs and symptoms of infection does not rule out a diagnosis of encephalitis. Often, delirium or similar fluctuations in consciousness or dyskinetic movements may appear after the seizure. The cerebrospinal fluid may be normal in encephalitis.  Parasomnias: Examples of parasomnias include night terrors, sleepwalking, and confusional arousal states. Typically, the child has no recollection of the event. Seizures mimicking parasomnias typically occur between 10-12 years of age (nocturnal frontal lobe epilepsy), older than the case presented here. Also post-paroxysmal deficits, especially asymmetrical motor deficits, are not reported. | | |
| **Notes to Developers:** For GEVC use only. Please do not edit or translate. | | |
| Notes to reviewers: Text is in orange  Notes to developers: multichoice/multianswer format. Develop as 02-3-1 | | |

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| **Module:** | A night time disturbance | **Screen ID** (module-topic-page #): |
| **Topic:** | Diagnosis | **03-6-2** |
| **Sub Topic:** | Next steps |
| **Primary Content:** For SME review | | |
| **Day 2, 00:30**  Attending: “How would you like to manage Ethan?”   * Keep Ethan in the ED for observation * Arrange for an urgent CT scan of his brain * Start Ethan on anticonvulsant medication * Perform a lumbar puncture | | |
| **Pop-up Text:** For SME review | | |
| ***Feedback***  Keep Ethan in the ED for observation: Given the normal physical exam and absence of fever, an infectious cause for Ethan’s seizure is unlikely. However, fever can sometimes be absent early on in infectious processes in children. Seizure recurrence after a first seizure/new onset is difficult to predict, especially in the absence of a clear etiology. Observing for at least a few hours will help make a decision regarding testing and treatment and reassure the parents. It will also provide an opportunity to teach parents about the immediate care for seizures that occur outside the hospital. In children, post-ictal paralysis or weakness is not that rare (Todd’s paralysis). However, it should last only a few hours and, by definition, resolve in less than a day.1  Arrange for an urgent CT scan of his brain: In this particular case, the fact that the two seizure episodes involved opposite sides of the body (seizure at home was on the right side and in the hospital it was on the left side) makes a structural focal lesion very unlikely. If imaging is still considered and the patient has a normal physical examination, an MRI is preferred over a CT scan as it has no radiation and much better image resolution (e.g., MRIs can pick up more subtle cortical changes than CTs).  Start Ethan on anticonvulsant medication: Starting an anticonvulsant is usually reserved for when the seizure reoccurs on a different day given that provoked and self-limited seizures will happen twice on the same day but will not require long-term prophylaxis. Not all epileptic syndromes require anticonvulsant prophylaxis.  Perform a lumbar puncture: A lumbar puncture is indicated as an initial investigation for a patient with febrile seizures and signs of meningeal irritation, encephalitis, or intracranial infection, or when the patient has been on antibiotics that could mask the signs and symptoms of meningitis. Consideration should also be given to performing a lumbar puncture in febrile infants ages 6-12 months who are unvaccinated or in whom the vaccination status is unknown for *Haemophilus influenza B* and *Streptococcus pneumoniae.* Consideration must also be given to a CT of the head prior to a lumbar puncture in any child with signs of increased intracranial pressure. Less common considerations for a lumbar puncture are in those who are immunocompromised (HIV), have severe headaches in verbal children, or altered mental status.6 | | |
| **Notes to Developers:** For GEVC use only. Please do not edit or translate. | | |
| Notes to reviewers: Text is in orange  Notes to developers: multichoice/multianswer | | |

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| **Module:** | A night time disturbance | **Screen ID** (module-topic-page #): |
| **Topic:** | Diagnosis | **03-6-3** |
| **Sub Topic:** | Diagnosis |
| **Primary Content:** For SME review | | |
| **Day 2, 00:30**  Attending: “What is the most likely diagnosis in this case?” | | |
| **Pop-up Text:** For SME review | | |
| **Feedback**  Seizure disorder: Benign Epilepsy of Childhood with Centrotemporal Spikes (BECTS). This is also known as “Benign Rolandic Epilepsy”. | | |
| **Notes to Developers:** For GEVC use only. Please do not edit or translate. | | |
| Notes to reviewers: Text is in orange  Notes to developers: Open text box with check answer button. Embed video 15.1 in feedback | | |

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| **Module:** | A night time disturbance | **Screen ID** (module-topic-page #): |
| **Topic:** | Management | **03-7-1** |
| **Sub Topic:** | Management plan |
| **Primary Content:** For SME review | | |
| **Day 2, 06:00**  Ethan is observed in the emergency department for the next few hours. He slept and woke up well rested. He ate well, remains afebrile, and wants to go home. His physical examination is normal and his left arm weakness has resolved.  Attending: “What are you going to do?”   * Discharge Ethan with neurology follow-up as an outpatient * Perform an MRI and then discharge Ethan with neurology follow-up * Perform an EEG and then discharge Ethan with neurology follow-up * Consult neurology and admit Ethan to hospital for observation and further investigations | | |
| **Pop-up Text:** For SME review | | |
| ***Feedback***  Discharge Ethan with neurology follow-up as an outpatient: Having the patient follow-up with neurology as an outpatient is appropriate but you need to arrange for some additional investigations to manage this case.  Perform an MRI and then discharge Ethan with neurology follow-up: A brain MRI is indicated in all new onset focal epilepsies but the urgency of the MRI is dependent on what you are looking for. Given the absence of concerning signs for infection, brain tumour, or a cerebrovascular event, this study could be done as an outpatient.1,9  Perform an EEG and then discharge Ethan with neurology follow-up: The EEG should be completed prior to discharge or soon after, depending on neurology’s request, as the results will determine patient disposition and management.1,9  a) A normal EEG suggests that seizures may not reoccur soon.  b) A very abnormal EEG with active epileptiform activity suggests the patient should be started on medication and potentially admitted.  c) An abnormal EEG in keeping with focal epileptiform pattern with significant added focal slowing (even in the absence of concerning clinical signs) suggests the patient needs to have an MRI completed as an inpatient, further observation, and treatment.  d) An EEG may show a pattern in keeping with a benign epileptic syndrome, which would reassure the family and clinicians and would help to inform timing around follow-up.  Consult neurology and admit Ethan to hospital for observation and further investigations: Indications for admission would be a prolonged post-seizure state (confusion, hemiparesis), multiple seizures the same day, status epilepticus, or abnormal findings on his neurologic exam. Although it would not be wrong to call neurology about this patient, you would typically call them if the patient needed to be admitted for further work-up or treated on an emergency basis. Otherwise, most patients with new onset seizures can be seen as outpatients in the neurology clinic. | | |
| **Notes to Developers:** For GEVC use only. Please do not edit or translate. | | |
| Notes to reviewers: Text is in orange  Notes to developers: multiple choice Q with check answer button. Learner must get answer right before moving on | | |

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| **Module:** | A night time disturbance | **Screen ID** (module-topic-page #): |
| **Topic:** | Outcome | **03-7-2** |
| **Sub Topic:** | Recurrence risk |
| **Primary Content:** For SME review | | |
| **Day 2, 09:00**  Mother: “What is the chance of Ethan having another seizure?” | | |
| **Pop-up Text:** For SME review | | |
| **Feedback**  Any patient with a single unprovoked epileptic seizure will need to be followed by the family doctor, pediatrician, or neurologist, as the chances of having a second seizure is 35% or more.  Determining whether a seizure is epileptic in nature is almost always made on a clinical basis. The diagnosis of epilepsy is a clinical one.    **Patient Chart:**  **Day 2, 06:00**  **MD note**  **Reassessment:** Lt arm weakness resolved. GCS 15, Remains afebrile, VSS.  Case discussed with neurology & EEG to be done this am. | | |
| **Notes to Developers:** For GEVC use only. Please do not edit or translate. | | |
| Notes to reviewers: Text is in orange  Notes to developers: Open text box with check answer button. Provide feedback when clicked | | |

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| **Module:** | A night time disturbance | **Screen ID** (module-topic-page #): |
| **Topic:** | Outcome | **03-7-3** |
| **Sub Topic:** | Discharge teaching for seizures |
| **Primary Content:** For SME review | | |
| **Day 2, 09:00**  Mother: “What should I do if Ethan has another seizure at home?” | | |
| **Pop-up Text:** For SME review | | |
| **Feedback**  Brief seizures do not permanently damage brain cells. If seizures last >30 minutes there is some evidence that suggests the brain could suffer permanent damage. However, most seizures do not last longer than 90 seconds.  If Ethan has a seizure, he should be placed on his side to allow clearing of the airway from secretions. Nothing should be introduced in the mouth. He will not swallow his tongue. If tongue biting occurs it usually is minimal and does not require sutures. It is helpful to observe his activity carefully to determine if the seizure is affecting his whole body or only specific areas.  After a seizure, it is normal for him to be tired, confused, and/or have a headache. If this is the case, rest and sleep are recommended.  If the seizure does not stop in 3-5 minutes, if he might have fallen and hit his head, and/or if he has a fever he should be assessed immediately.  If he has been prescribed a rescue medication, usually it is to be used as needed for seizures lasting >3 minutes and can be repeated 5 minutes after the first dose. If the seizure(s) continue(s) following administration of the medication then call an ambulance. | | |
| **Notes to Developers:** For GEVC use only. Please do not edit or translate. | | |
| Notes to reviewers: Text is in orange  Notes to developers: Open text box with check answer button. Provide feedback when clicked | | |

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| **Module:** | A night time disturbance | **Screen ID** (module-topic-page #): |
| **Topic:** | Outcome | **03-7-4** |
| **Sub Topic:** | Outpatient follow-up |
| **Primary Content:** For SME review | | |
| **Day 2, 09:30**  Attending: “Ethan’s EEG did not show any epileptiform activity. We are going to discharge him home to follow-up with neurology. Will Ethan need another EEG? If so, under what conditions?” | | |
| **Pop-up Text:** For SME review | | |
| **Feedback**  Request a sleep deprived EEG for Ethan as an outpatient.  Often, abnormalities on EEGs are only seen during sleep, when sleep deprived, or during longer recordings. Therefore, there is added potential diagnostic value to repeating an EEG during sleep. Further, sleep may enhance some abnormalities seen during wakefulness.Kavros,epilepsy.com  The EEG is an instrument that helps to classify and better characterize seizures and seizure disorders. The EEG can be normal in 50% of all new cases of epilepsy. Detection of EEG abnormalities is subject to technical factors such as artefacts, number of leads placed, and interpretation. | | |
| **Notes to Developers:** For GEVC use only. Please do not edit or translate. | | |
| Notes to reviewers: Text is in orange  Notes to developers: Open text box and check answer. Provide feedback when clicked | | |

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| **Module:** | A night time disturbance | **Screen ID** (module-topic-page #): |
| **Topic:** | Outcome | **03-7-5** |
| **Sub Topic:** | Repeat EEG |
| **Primary Content:** For SME review | | |
| **Day 5, 14:00**  A second EEG was done on Ethan as an outpatient while he was sleep-deprived.  [show report] | | |
| **Pop-up Text:** For SME review | | |
| **Report**  The background activity is normal, suggesting no structural lesions, nor encephalopathy.  There are occasional centrotemporal spikes on the right and left hemispheres independently. Epileptiform discharges are exacerbated by sleep. This suggests your patient has *Benign epilepsy of childhood with centrotemporal spikes* (BECTS). This is also known as “Benign Rolandic Epilepsy”.  **Patient Chart:**  **Day 2, 11:30**  **MD note**  Clinically stable. EEG shows no epileptiform activity. Labs normal.  Requisition sent for outpatient MRI, repeat EEG (sleep deprived)  D/C and follow-up neurology as outpatient later this week.  Sz teaching completed with parents.  **Day 5, 14:00**  **Neurology outpatient clinic.**  EEG consistent with BECTS. See EEG report. MRI booked.  F/U neurology clinic 3/12. | | |
| **Notes to Developers:** For GEVC use only. Please do not edit or translate. | | |
| Notes to reviewers: Text is in orange  Notes to developers: Present the report in the form of a letter (Medtech to help design) | | |

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| **Module:** | A night time disturbance | **Screen ID** (module-topic-page #): |
| **Topic:** | Outcome | **03-7-6** |
| **Sub Topic:** | Features of BECTS |
| **Primary Content:** For SME review | | |
| **Day 5, 14:30**    Attending: “Think about Ethan’s case and how he presented. List 3 characteristic features of BECTS/Benign Rolandic Epilepsy” | | |
| **Pop-up Text:** For SME review | | |
| **Feedback**   1. **Occurred at night**: BECTS seizures often occur at night 2. **Partial seizure with no loss of consciousness**: Consciousness is usually preserved in BECTS. However, in about a third of patients with BECTS, seizures will progress to a generalized seizure and loss of consciousness. 3. **Facial twitching, gurgling sounds**: Common characteristics of BECTS include:    1. Unilateral sensorimotor involvement of the face; mostly of the tongue, lip, inner cheek, gums, and teeth, lasting for a few seconds to 1 minute    2. Inability to speak; although often gargling, grunting, or guttural sounds are present    3. Less commonly, such as in Ethan’s case, the abnormal movements spread to the ipsilateral upper extremity    4. Hemifacial sensory seizures (no motor) are less common | | |
| **Notes to Developers:** For GEVC use only. Please do not edit or translate. | | |
| Notes to reviewers: Text is in orange  Notes to developers: Open text box and provide Check Answer button. Provide feedback when clicked | | |

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| **Module:** | A night time disturbance | **Screen ID** (module-topic-page #): |
| **Topic:** | Follow-up | **03-7-7** |
| **Sub Topic:** | Use of anticonvulsants |
| **Primary Content:** For SME review | | |
| **3 months later**  Mother: “Ethan hadn’t had any seizures over the past 3 months, but then yesterday he had another seizure at home. It’s been really busy over the holidays and Ethan has had some rather late bedtimes. I think he’s really tired. The seizure didn’t last long and he didn’t lose consciousness.  Now that he has had a third seizure, would he benefit from anticonvulsants?”  *What do you do?*   * Start carbamazepine * Start clobazam * Repeat the EEG * Reassure the family and work on sleep hygiene | | |
| **Pop-up Text:** For SME review | | |
| **Feedback**  Start carbamazepine: Rolandic seizures do not require anticonvulsant therapy. However, in rare cases, anticonvulsants are offered if a patient has very frequent, prolonged, or recurrent associated generalized tonic-clonic seizures. If antiepileptic medication is required, carbemazepine is a good choice.  Start clobazam: Rolandic seizures do not require anticonvulsant therapy. However, in rare cases, anticonvulsants are offered if a patient has very frequent, prolonged, or recurrent associated generalized tonic-clonic seizures. If antiepileptic medication is required, clobazam is a good choice.  Repeat the EEG: The initial EEG showed the typical pattern in BECTS. Ethan’s seizure presentation has not changed. Repeating the study will not change your management, so there is no benefit to repeating the EEG.  Reassure the family and work on sleep hygiene: Most patients with BECTS do not require anticonvulsant treatment. Sleep deprivation is a common seizure trigger in many epileptic syndromes and particularly in BECTS. Rolandic seizures often resolve after 2-4 years from onset. The total number of seizures during this time is low, often less than 10 seizures in total. Development is not impaired. Once this is explained and sleep hygiene emphasized, usually the family is comfortable with not giving anticonvulsant medications. | | |
| **Notes to Developers:** For GEVC use only. Please do not edit or translate. | | |
| Notes to reviewers: Text is in orange  Notes to developers: m/c question. Have to get answer correct before moving on | | |

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| **Module:** | A night time disturbance | **Screen ID** (module-topic-page #): |
| **Topic:** | Follow-up | **03-7-8** |
| **Sub Topic:** | Epidemiology |
| **Primary Content:** For SME review | | |
| Mother: “How common is this type of seizure in children Ethan’s age?”  Benign Epilepsy with Centro Temporal Spikes(BECTS) is the most common idiopathic epilepsy syndrome in children.  The peak onset of BECTS is at 5-6 years.  Girls are more likely to have Benign Rolandic Epilepsy than boys  About 15% of idiopathic epilepsy in children is due to BECTS.  The incidence of BECTS is 10-20/100,000 in children age 0-15 years old. | | |
| **Pop-up Text:** For SME review | | |
| **Feedback4**  Benign Rolandic Epilepsy or Benign Epilepsy with Centotemporal Spikes is the most common idiopathic epilepsy syndrome.in children.: *T*  The peak onset of BECTS is at 5-6 years. *F: The peak onset is at 8-9 years.*  Girls are more likely to have Benign Rolandic Epilepsy than boys. *F: There is a 1.5 male predominance.*  About 15% of idiopathic epilepsy in children is due to BECTS. *T*  The incidence of BECTS is 10-20/100,000 in children age 0-15 years old. *T* | | |
| **Notes to Developers:** For GEVC use only. Please do not edit or translate. | | |
| Notes to reviewers: Text is in orange  Notes to developers: This is a series of T/F Qs. Program something like this (answers and feedback are above): | | |

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| **Module:** | A night time disturbance | **Screen ID** (module-topic-page #): |
| **Topic:** | Follow-up | **03-7-9** |
| **Sub Topic:** | BECTS |
| **Primary Content:** For SME review | | |
| Mother: “Would you say that Ethan’s case is typical for this epilepsy syndrome?” | | |
| **Pop-up Text:** For SME review | | |
| **Feedback**  Yes. Ethan presents with the typical clinical picture for Benign Rolandic Epilepsy. This includes his age, the clinical picture of his seizures, the association with sleep and sleep deprivation, and a normal physical examination, normal development, and the characteristic EEG findings.3 | | |
| **Notes to Developers:** For GEVC use only. Please do not edit or translate. | | |
| Notes to reviewers: Text is in orange  Notes to developers: Open text box and check answer button, Provide feedback when clicked | | |

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| **Module:** | A night time disturbance | **Screen ID** (module-topic-page #): |
| **Topic:** | Follow-up | **03-7-10** |
| **Sub Topic:** | Long-term prognosis |
| **Primary Content:** For SME review | | |
| Mother: “Will Ethan remain epileptic for the rest of his life?” | | |
| **Pop-up Text:** For SME review | | |
| **Feedback**  Probably not. The prognosis for BECTS is excellent. Virtually 95% of patients outgrow the syndrome before the age of 15 and virtually 100% outgrow it by 18 years of age.10 | | |
| **Notes to Developers:** For GEVC use only. Please do not edit or translate. | | |
| Notes to reviewers: Text is in orange  Notes to developers: Open text box and check answer button. Provide feedback when clicked | | |

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| **Module:** | A night time disturbance | **Screen ID** (module-topic-page #): |
| **Topic:** | Clinical pearls | **03-8** |
| **Sub Topic:** | Take home points |
| **Primary Content:** For SME review | | |
| On a piece of paper, summarize the 5 most important points you will take home from this case. Bring this paper with you to the review session at the end of the block. | | |
| **Pop-up Text:** For SME review | | |
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| **Notes to Developers:** For GEVC use only. Please do not edit or translate. | | |
| Notes to reviewers: Text is in orange  Notes to developers: Same format as 01-8-3 | | |

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| **Module:** | A night time disturbance | **Screen ID** (module-topic-page #): |
| **Topic:** | Credits | **03-9** |
| **Sub Topic:** |  |
| **Primary Content:** For SME review | | |
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| **Pop-up Text:** For SME review | | |
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| **Notes to Developers:** For GEVC use only. Please do not edit or translate. | | |
| May need to present this as an expanding list; like on this page: http://rjh.goingeast.ca/SCI5/About.html | | |

**References:**

1. Fenichel GM, Clinical Pediatric Neurology: A Signs and Symptoms Approach 6th ed. Philadelphia: Saunders Elsevier; 2009.
2. Kavros P, Clarke T, Strug L, Halperin J, Dorta N, Pal et al. Attention impairment in rolandic epilepsy: systematic review. Epilepsia. 2008 Sep;49(9):1570-80.
3. Kaddurah AK. Benign Childhood Epilepsy. Emedicine Medscape Reference[Internet].2011 May 17 [cited 2013 Apr 3] Available from: <http://emedicine.medscape.com/article/1181649-overview>
4. Bureau M, Genton P, Dravet C, Delgado-Escueta A, A Tassinari C, Thomas P, et al. Epileptic Syndromes in Infancy, Childhood and Adolescence 5th ed. France: John Libbey Eurotext; 2012.
5. Friedman J, Emergency management of the paediatric patient with generalized convulsive status epilepticus. Pediatric Child Health. 2011 Feb;16(2): 91-7. Available from: <http://www.cps.ca/en/documents/position/convulsive-status-epilepticus>
6. Subcommittee on Febrile Seizures. Febrile Seizures: Guideline for the Neurodiagnostic Evaluation of the Child With a Simple Febrile Seizure. *Pediatrics.* 2011 Feb; *127*(2):389-394.
7. Hospital for Sick Children. The 2008-2009 Drug Handbook and Formulary. Toronto: The Hospital for Sick Children; 2008.
8. Lexi-comp. Lexicomp on-line formulary. [internet] Hudson, Ohio: Lexi-Comp, Inc [cited 2013 Apr 4].
9. Kramer U, Nevo Y, Neufeld MY, Fatal A, Leitner Y, Harel S. Epidemiology of epilepsy in childhood: a cohort of 440 consecutive patients. Pediatric Neurology.1998 Jan;18(1):46-50.
10. Wirrell E. Benign epilepsy of childhood with centrotemporal spikes. *Epilepsia.* 1998; *39*:32-41.
11. Holmes GL. Benign Rolandic Epilepsy. Epilepsy.com[Internet]. 2006 Oct 21 [cited 2013 Apr 3] Available from: <http://www.epilepsy.com/epilepsy/epilepsy_benignrolandic>
12. Chapter 9, Benign Childhood Focal Seizures and Related Epileptic Syndromes. In: Panayiotopoulos CP. The Epilepsies: Seizures, Syndromes and Management. Oxfordshire (UK): Bladon Medical Publishing; 2005. Available from: <http://www.ncbi.nlm.nih.gov/books/NBK2598/>

**Seizure Type Figure**

Patients can have more than one seizure type. One seizure type may progress into another as the electrical activity spreads throughout the brain. A typical progression is from a simple partial seizure, to a complex partial seizure (when the patient becomes confused), to a secondarily generalized tonic-clonic seizure (when the electrical activity has spread throughout the entire brain). The brain has control mechanisms to keep seizures localized. Antiepileptic medications enhance the ability of the brain to limit the spread of a seizure. Up to 30% of partial seizures can progress to generalized seizures.

**The following text is presented as mouseover/popups over the content in the table**

**Partial seizures**

In a partial seizure, the onset of the seizure is in one part of the brain, resulting in focal symptoms such as twitching in the arm or face, a sensory change, or a focal change in memory, for example the type that occurs with temporal lobe seizures.

**Simple partial seizures**

* Simple partial seizures include motor seizures with twitching; abnormal sensations, visions, sounds or smells; and distortions of perception.
* The seizure activity can spread to the autonomic nervous system, resulting in flushing, tingling, or nausea.
* Consciousness is not impaired in simple partial seizures and the patient has full recall of the event. If the patient becomes confused or cannot remember what is happening during the seizure, then the seizure is classified as a complex partial seizure.

**Complex partial seizures**

* A complex partial seizure is a partial seizure with a loss of consciousness.
* 30% of partial seizures will progress to generalized seizures
* Approximately half of patients will have an aura, which is a warning for the seizure. This is typically a familiar feeling (déjà vu), nausea, heat, tingling, or distortion of sensory perceptions.
* During a complex partial seizure, patients may fumble or perform automatic fragments of activity such as lip smacking, picking at their clothes, walking around aimlessly, or saying nonsense phrases over and over. This purposeless activities are called *automatisms*. 75% people with complex partial seizures have automatisms. 25% simply stop, stare, and blank out for a few seconds or minutes.

**Generalized seizures**

* Generalized seizures originate in the deep structures of the brain and simply project to the cortical surface where we can see the manifestations of the seizure emerge relatively simultaneously.
* Generalized seizures involve both hemispheres or the brain.
* Generalized seizures can be convulsive or non-convulsive.

**Non-convulsive seizures**

* Non-convulsive seizures are absence seizures, also known as petit mal seizures.
* Absence seizures can persist into adulthood.
* They present with staring spells lasting several seconds, sometimes in conjunction with eyelid fluttering or head nodding.
* Absence seizures are typically brief and end abruptly with resumption of the child’s activity. These seizures can be difficult to distinguish from complex partial seizures that also may result in staring. An EEG can help to distinguish an absence from a complex partial seizure.

**Tonic-clonic seizures**

* Tonic-clonic seizures are also known as grand mal seizures.
* They start with a sudden loss of consciousness and tonic activity (stiffening) followed by clonic activity (rhythmic jerking) of the limbs.
* The patient’s eyes roll up at the beginning of the seizure and the patient will typically emit a cry, not because of pain, but because of contraction of the respiratory muscles against a closed throat.
* They typically last 1-3 minutes.
* After the seizure, the patient is “post-ictal”: sluggish, sleepy, and confused. This period can last for hours.
* Seizures that begin focally can spread to the entire brain, in which case a tonic-clonic seizure ensues. It is important, however, to distinguish those that are true grand mal seizures—that are generalized from the start—from those that start focally and secondarily generalize. Secondarily generalized seizures arise from a part of the brain that is focally abnormal. Patients with secondarily generalized tonic-clonic seizures may be candidates for curative epilepsy surgery. Drugs used to treat primarily and secondarily generalized tonic-clonic seizures are different.

**Myoclonic seizures**

* A myoclonic seizure is the rapid jerking of the body or limbs on one or both sides of the body.

**Atonic/akinetic seizures**

* Atonic akinetic seizures are also known as epileptic drop attacks.
* People with atonic seizures suddenly become limp and may fall to the ground.
* Atonic seizures in infants are often seen as a head drop.

**Tonic seizures**

* Tonic seizures involve the stiffening of muscles as the primary seizure manifestation (arms or legs may extend forward or up into the air) without the clonic (jerking) phase.
* Consciousness may or may not be lost.