Epilepsy Updates

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TBMS Winter School

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Faculty/Presenter Disclosure Slide 1

- **Faculty:** Ayman Hassan

- **Relationships with commercial interests:**
  - **Grants/Research Support:** site PI for Astra Zeneca SOCRATIS, BIOGEN IDEC ESTEEM, BAYER NAVIGATE.
  - **Other:** Employee of TBRHSC

Disclosure of Commercial Support Slide 2

- **This presentation has not received any financial support or in-kind support from anyone.**

- **<u>Potential for conflict(s) of interest</u>:**

  - I haven't received any payment/funding from any organization supporting this program and no product of AstraZeneca, Bayer or Biogen Idec will be discussed in this program.

Objectives

- Definition of seizure and epilepsy
- New guidelines for treatment of first seizure by AAN
- Epilepsy in Ontario
- Epilepsy Implementation Task Force ON objectives.
- Barrier to epilepsy surgery from patient and neurologist perspectives

Background: What is a Seizure?

- Epileptic Seizure

  An epileptic seizure is a transient occurrence of signs and/or symptoms due to abnormal excessive and or synchronous neuronal activity in the brain (Fisher et al., 2005)

Background: What is Epilepsy?

- Epilepsy

  Disorder of the brain characterized by an enduring predisposition to generate epileptic seizures and by the neurobiological, cognitive, psychological, and social consequences of this condition.

  The definition of epilepsy requires the occurrence of at least one epileptic seizure (Fisher et al, 2005).

  In most situations, occurrence of two epileptic seizures is an indication of enduring predisposition to generate epileptic seizures.

SPECIAL ARTICLE

Evidence-based guideline: Management of an unprovoked first seizure in adults

Report of the Guideline Development Subcommittee of the American Academy of Neurology and the American Epilepsy Society

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David S. Gloss, MD
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Arif A. Kabir, MD
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ABSTRACT

Objective: To provide evidence-based recommendations for treatment of adults with an unprovoked first seizure.

Methods: We defined relevant questions and systematically reviewed published studies according to the American Academy of Neurology's classification of evidence criteria; we based recommendations on evidence level.

Results and recommendations: Adults with an unprovoked first seizure should be informed that their seizure recurrence risk is greatest early within the first 2 years (21%–45%) (Level A), and clinical variables associated with increased risk may include a prior brain insult (Level A), an EEG with epileptiform abnormalities (Level A), a significant brain-imaging abnormality (Level B), and a nocturnal seizure (Level B). Immediate antiepileptic drug (AED) therapy, as compared with delay of treatment pending a second seizure, is likely to reduce recurrence risk within the first 2 years (Level B) but may not improve quality of life (Level C). Over a longer term (>3 years), immediate AED treatment is unlikely to improve prognosis as measured by sustained seizure remission (Level B). Patients should be advised that risk of AED adverse events (AEs) may range from 7% to 31% (Level B) and that these AEs are likely predominantly mild and reversible. Clinicians' recommendations whether to initiate immediate AED treatment after a first seizure should be based on individualized assessments that weigh the risk of recurrence against the AEs of AED therapy, consider educated patient preferences, and advise that immediate treatment will not improve the long-term prognosis for seizure remission but will reduce seizure risk over the subsequent 2 years. *Neurology*® 2015;84:1705–1713

Background: Classification of Epileptic Seizures

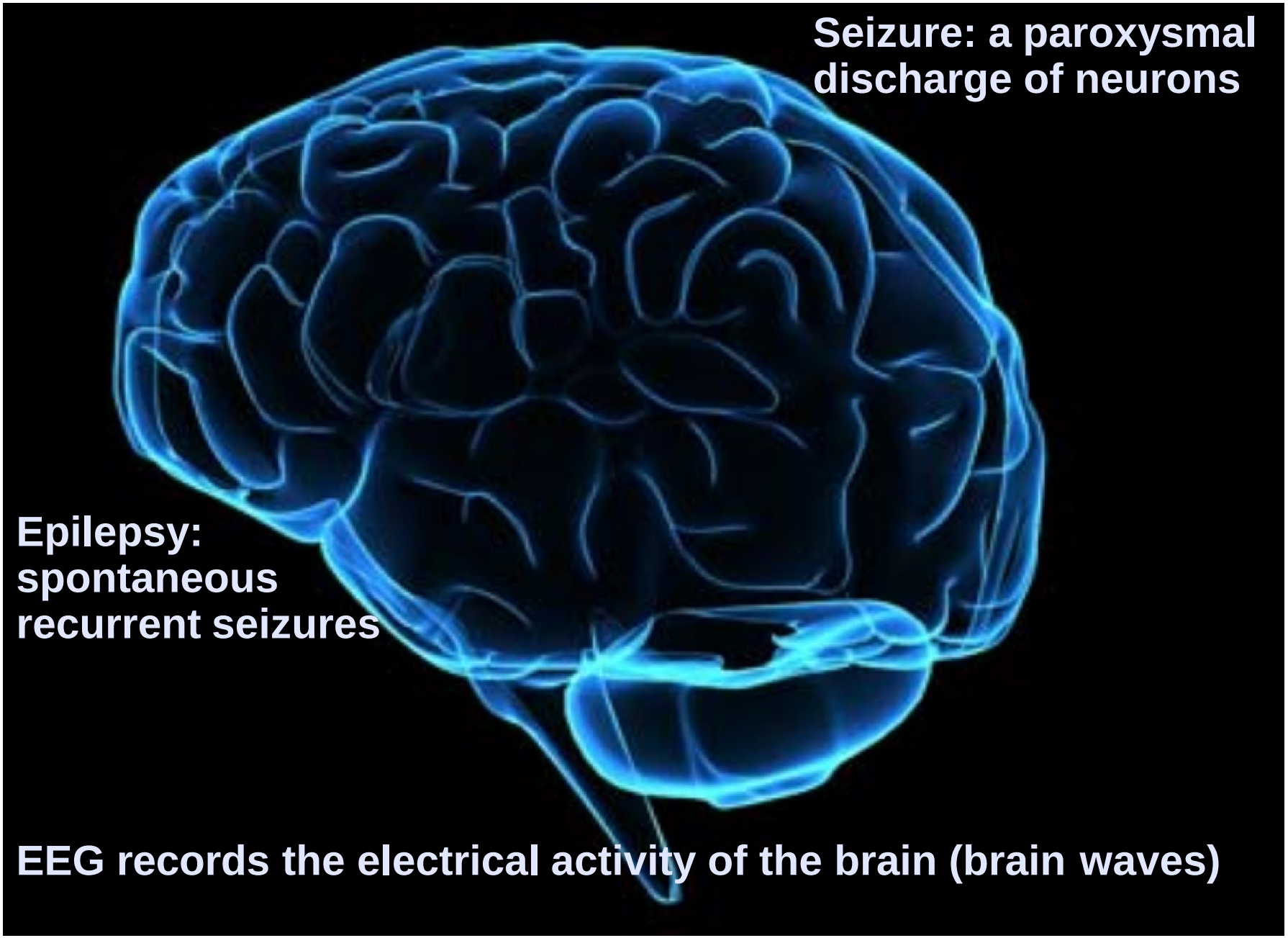
- Generalized seizures

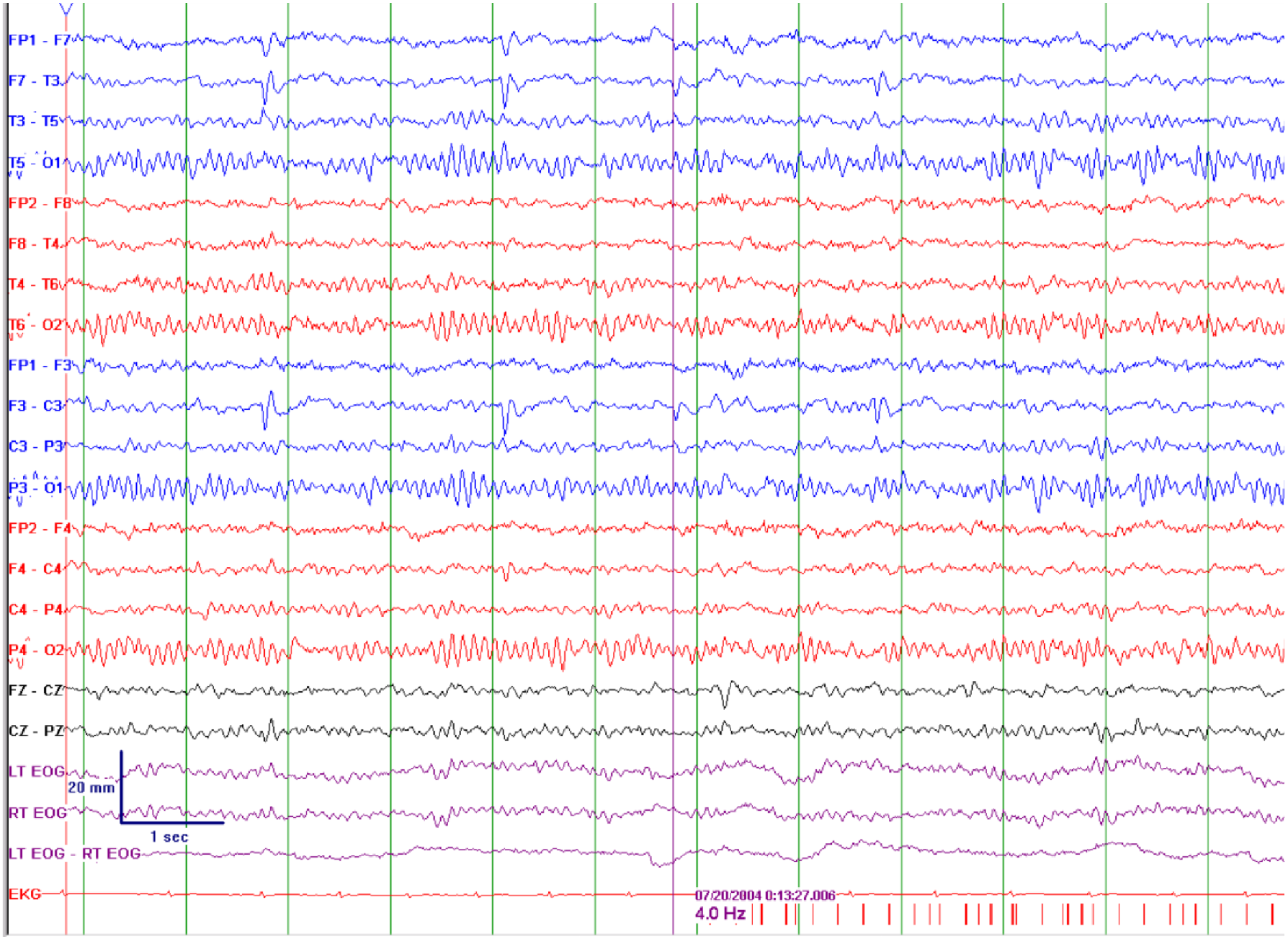
  Conceptualize as originating at some point within, and rapidly engaging, bilaterally distributed networks. They can be classified as tonic-clonic, absence, myoclonic, clonic, tonic, and atonic.

- Focal Seizures

  Conceptualized as originating within networks limited to one hemisphere. Descriptors of focal seizures include:

  - Those without impairment of consciousness or awareness (concept of a simple partial seizure) but observable motor or autonomic components and/or subjective sensory or psychic phenomena (simple partial seizures)
  - Those with impairment of consciousness or awareness (concept of a complex partial seizure) - these may evolve to bilateral convulsive seizures


Seizure: a paroxysmal discharge of neurons
Epilepsy: spontaneous recurrent seizures
EEG records the electrical activity of the brain (brain waves)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T6 - O2
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C3 - P3
P3 - O1
FP2 - F4
F4 - C4
C4 - P4
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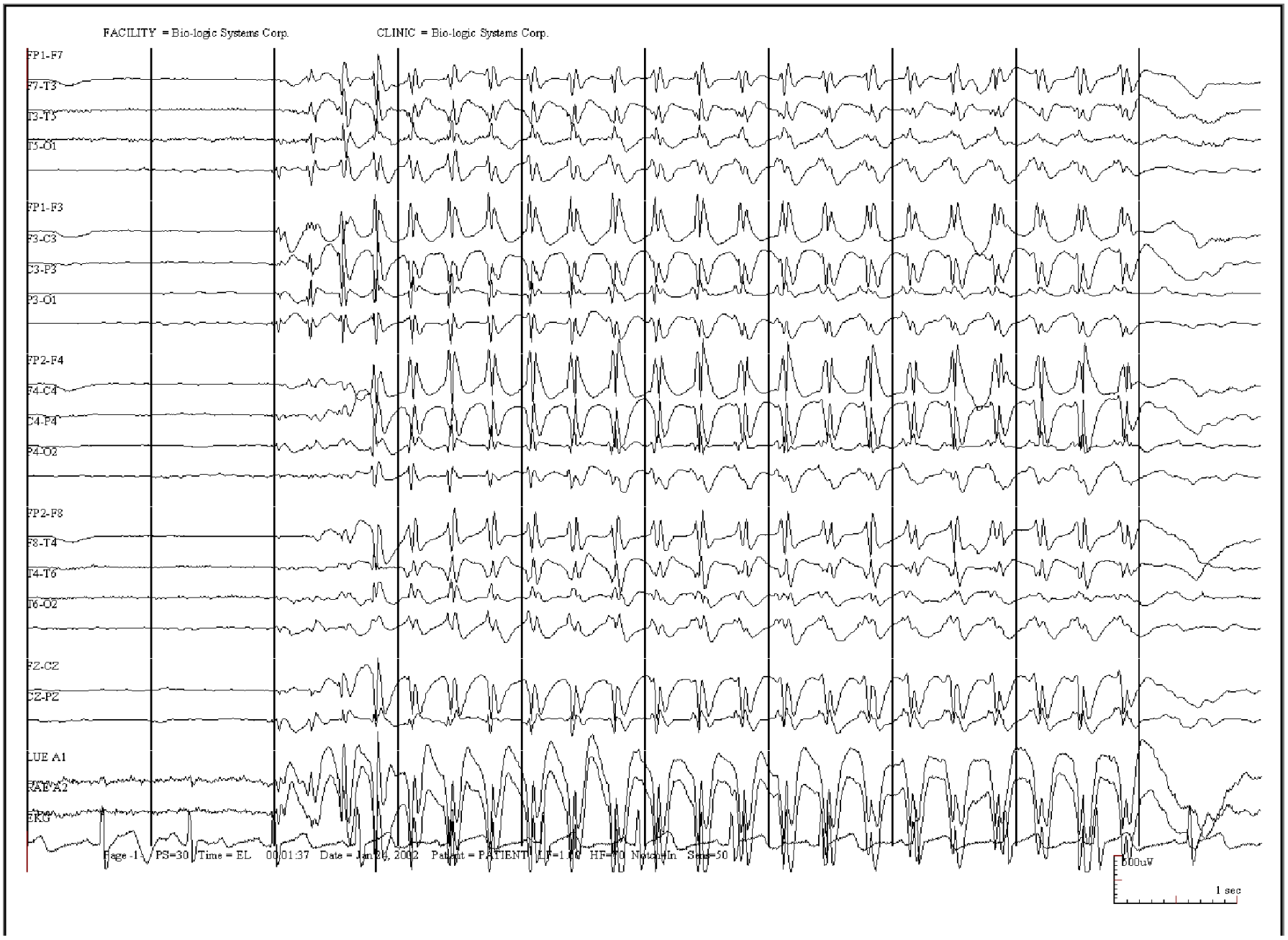
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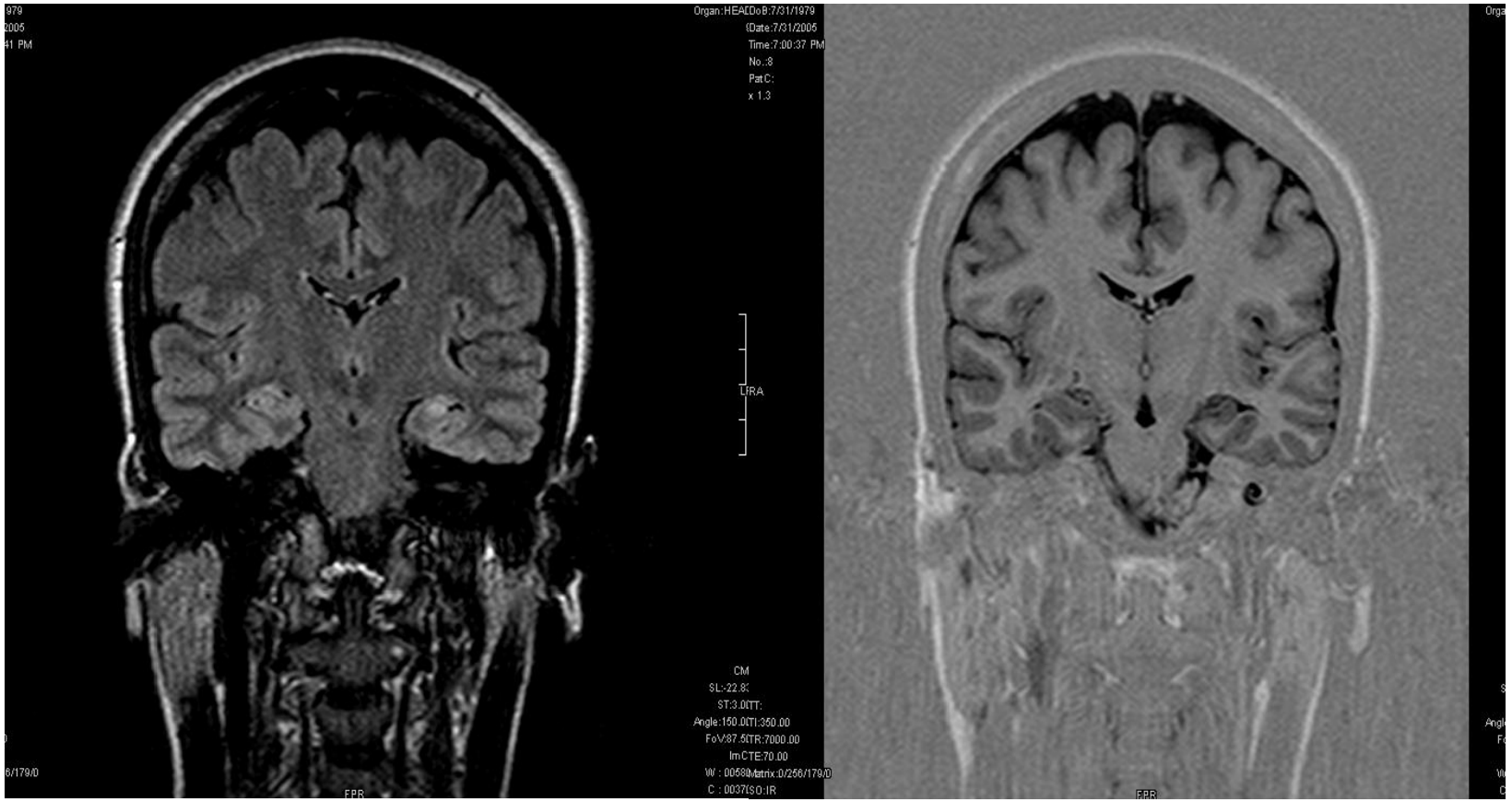
Case # 1

- 26 ys old, female patient, Rt handed
- History of head trauma at age of 9 ys, no FC and no FH of epilepsy
- Age at onset: 11ys
- Sz frequency: 6 / mon
- Sz semiology: Lt Temporal CPS and 2ry GTC
- Examination: NAD
- Medication used: CBZ, LTG, TPM, LVT

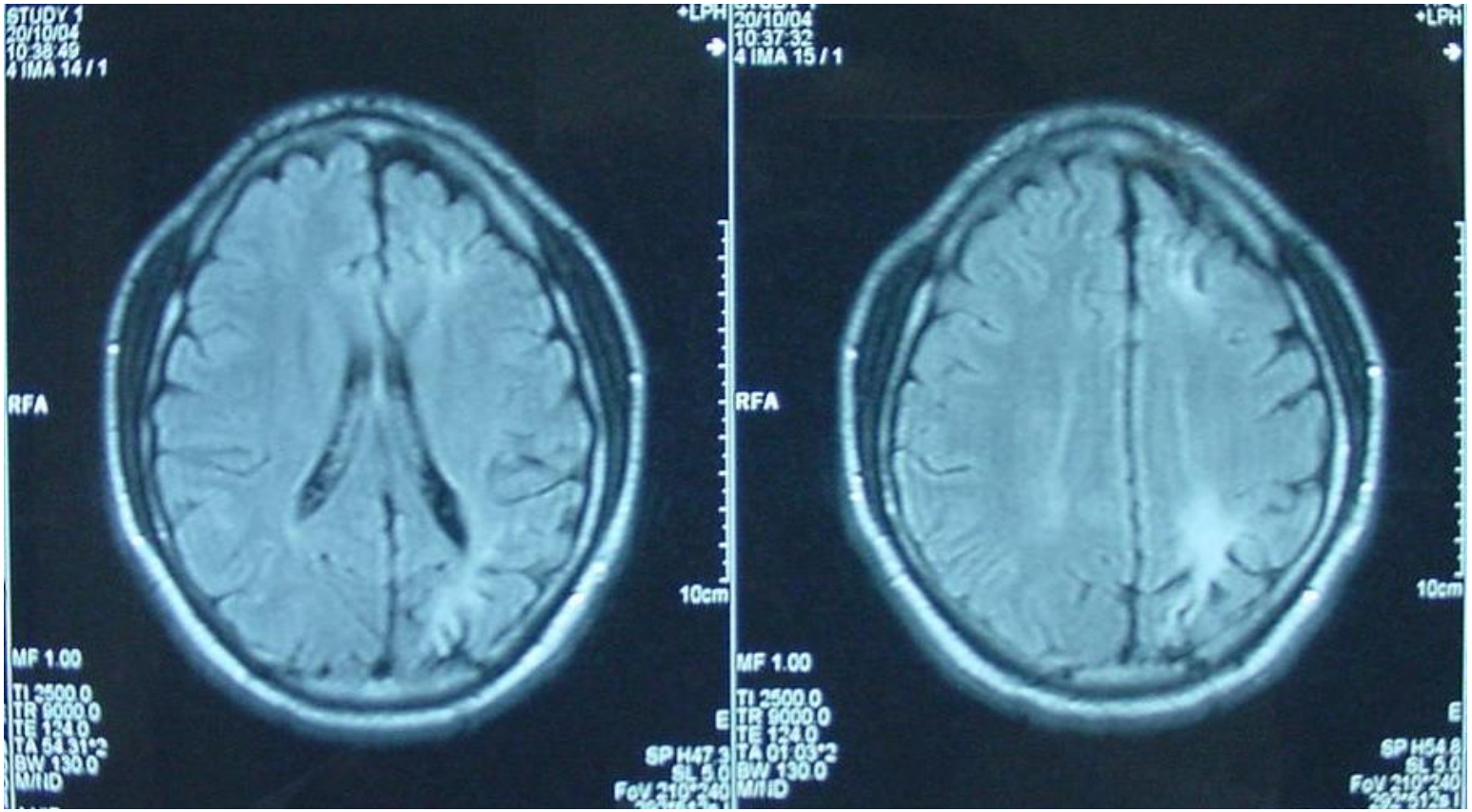
Preoperative MRI



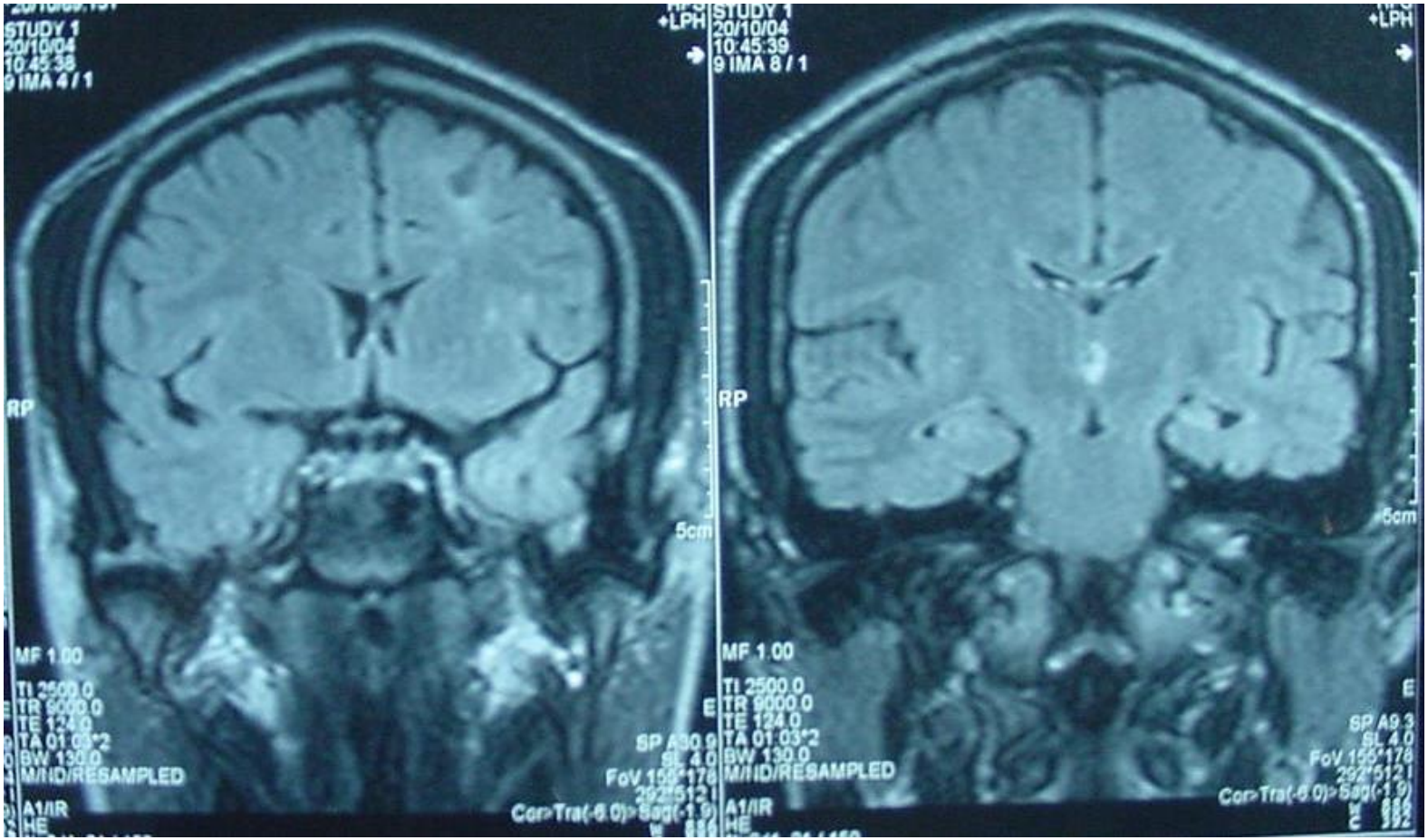
Case # 2

- 21 years old male, Rt handed, poor scholastic achievement, history of head trauma at the age of 3 month, and no family history of epilepsy.
- He had history of complicated febrile convulsion at the age of 7 months and at the age of 1 year started to have afebrile seizures
- Aura: green and purple colours on his right side.
- Seizure semiology: Lt Occipital focal and 2ry GTC
- Seizure frequency: 2 / month
- Aura frequency: 2 / month
- Examination: NAD including visual field.
- Medications used : PB, CBZ

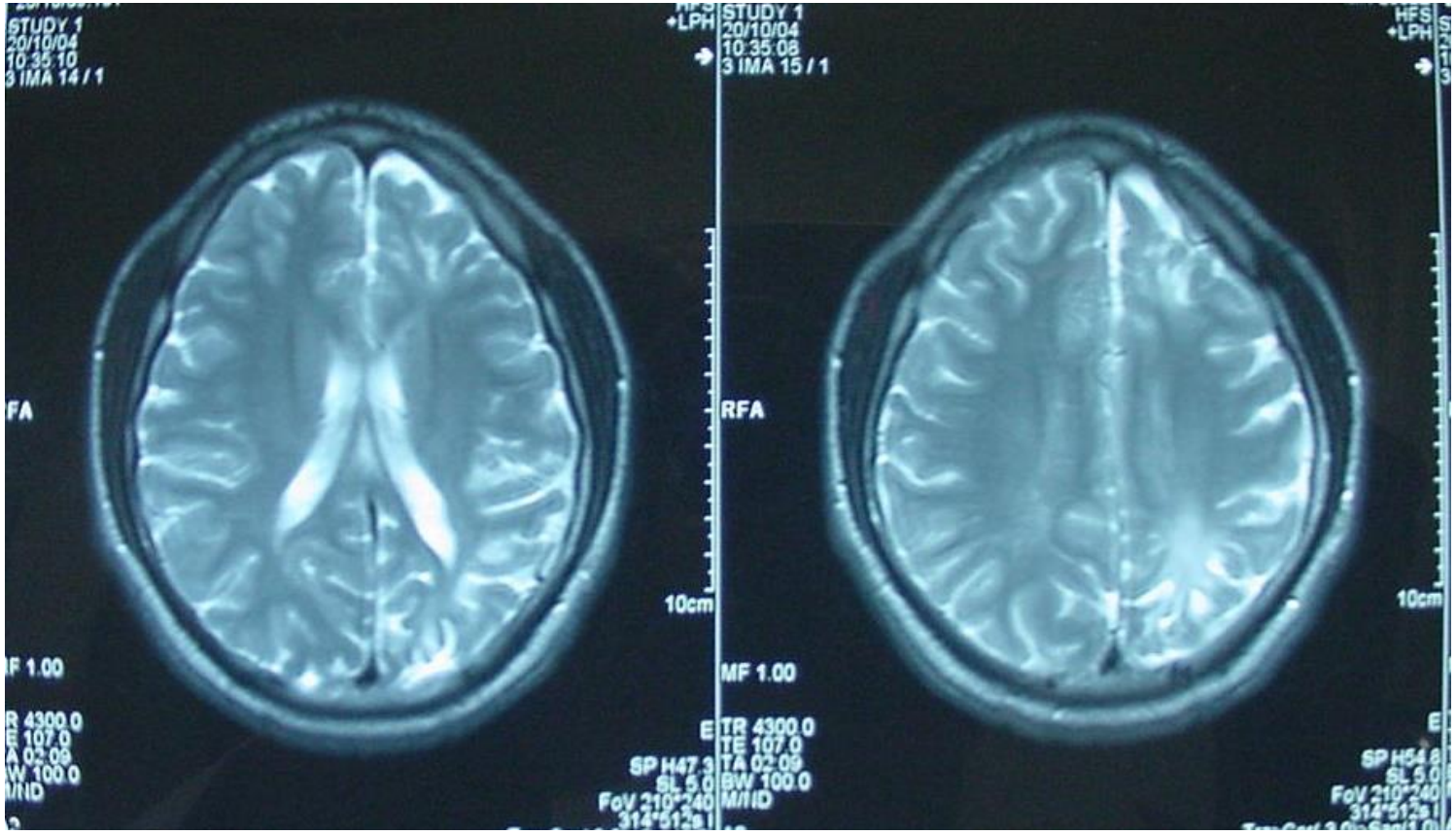
Preoperative MRI



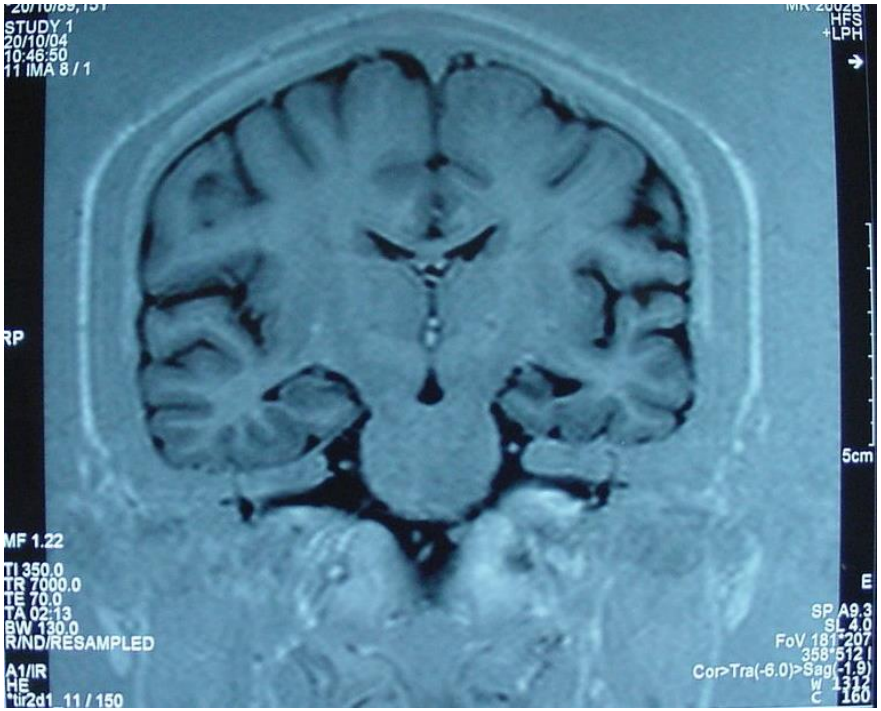
Preoperative MRI

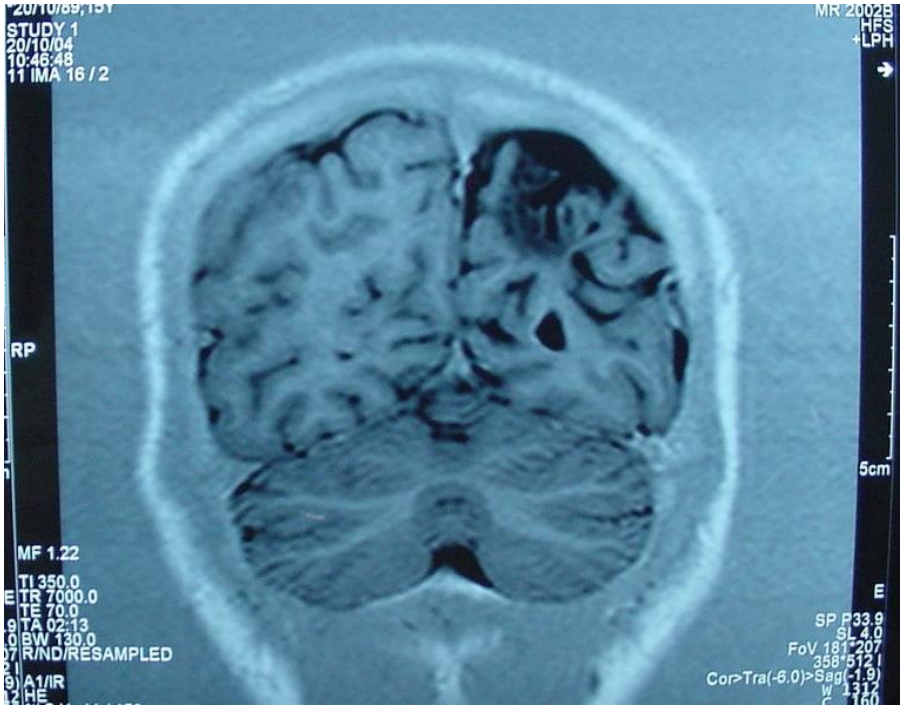


Preoperative MRI



Preoperative MRI





The New England
Journal of Medicine

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A RANDOMIZED, CONTROLLED TRIAL OF SURGERY FOR TEMPORAL-LOBE EPILEPSY

SAMUEL WIEBE, M.D., WARREN T. BLUME, M.D., JOHN P. GIRVIN, M.D., PH.D., AND MICHAEL ELIASZIW, PH.D., FOR THE EFFECTIVENESS AND EFFICIENCY OF SURGERY FOR TEMPORAL LOBE EPILEPSY STUDY GROUP*

ABSTRACT

Background Randomized trials of surgery for epilepsy have not been conducted, because of the difficulties involved in designing and implementing feasible studies. The lack of data supporting the therapeutic usefulness of surgery precludes making strong recommendations for patients with epilepsy. We conducted a randomized, controlled trial to assess the efficacy and safety of surgery for temporal-lobe epilepsy.

Methods Eighty patients with temporal-lobe epilepsy were randomly assigned to surgery (40 patients) or treatment with antiepileptic drugs for one year (40 patients). Optimal medical therapy and primary outcomes were assessed by epileptologists who were unaware of the patients' treatment assignments. The primary outcome was freedom from seizures that impair awareness of self and surroundings. Secondary outcomes were the frequency and severity of seizures, the quality of life, disability, and death.

Results At one year, the cumulative proportion of patients who were free of seizures impairing awareness was 58 percent in the surgical group and 8 percent in the medical group ($P<0.001$). The patients in the surgical group had fewer seizures impairing awareness and a significantly better quality of life ($P<0.001$ for both comparisons) than the patients in the medical group. Four patients (10 percent) had adverse effects of surgery. One patient in the medical group died.

Conclusions In temporal-lobe epilepsy, surgery is superior to prolonged medical therapy. Randomized trials of surgery for epilepsy are feasible and appear to yield precise estimates of treatment effects. (N Engl J Med 2001;345:311-8.)

EPILEPSY, a serious health problem that affects people of all ages, races, and socioeconomic backgrounds, has a prevalence of 5 to 10 per 1000 population in North America.[1,2] Epilepsy is the second most common cause of mental health disability, particularly among young adults,[3] and accounts for a worldwide burden of illness similar to that of breast cancer in women and lung cancer in men.[4]

Seizures in temporal-lobe epilepsy, which often start in childhood in otherwise healthy persons, occur both as simple partial seizures with preserved awareness of self and surroundings (also known as auras or warnings) and as disabling complex partial seizures in which awareness is impaired. During simple partial seizures, patients commonly experience a variety of psychic, gustatory, olfactory, and autonomic symptoms. During complex partial seizures, patients lose awareness and typically have a motionless stare accompanied by automatisms — stereotyped, repetitive, involuntary movements such as lip smacking, chewing, picking at objects, scratching, and gesturing. Generalized convulsions also occur in a substantial number of patients. Hughlings Jackson's description of Dr. Z's temporal-lobe epilepsy a century ago is a classic in medicine.[5] Dr. Z's condition thwarted his distinguished academic medical career and culminated in his untimely death.

Recent advances in neuroimaging and surgical techniques have improved the surgical treatment of epilepsy to such an extent that some experts now suggest that physicians should offer surgery early to patients with surgically remediable epileptic syndromes instead

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Disparities in surgery among patients with intractable epilepsy in a universal health system

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ABSTRACT

Objective: To assess the use of epilepsy surgery in patients with medically intractable epilepsy in a publicly funded universal health care system.

Methods: We performed a population-based retrospective cohort study using linked health care databases for Ontario, Canada, between 2001 and 2010. We identified all patients with medically intractable epilepsy, defined as those with seizures that did not respond to at least 2 adequate trials of seizure medications. We assessed the proportion of patients who had epilepsy surgery within the following 2 years. We further identified the characteristics associated with epilepsy surgery.

Results: A total of 10,661 patients were identified with medically intractable epilepsy (mean age 47 years, 51% male); most (74%) did not have other comorbidities. Within 2 years of being defined as medically intractable, only 124 patients (1.2%) underwent epilepsy surgery. Death occurred in 12% of those with medically intractable epilepsy. Those who underwent the procedure were younger and had fewer comorbidities compared to those who did not.

Conclusion: In our setting of publicly funded universal health care, more than 10% of patients died within 2 years of developing medically intractable epilepsy. Epilepsy surgery may be an effective treatment for some patients; however, fewer than 2% of patients who may have benefited from epilepsy surgery received it. *Neurology*® 2016;86:1–7

Background: Epilepsy in Ontario

- 80,000 adults and 15,000 children are diagnosed with epilepsy
- 30% of those diagnosed have medically-refractory epilepsy (seizures that do not respond to treatment with two or more syndrome appropriate antiepileptic drugs)
- Second only to headache as most common chronic neurological condition in Ontario
- Average delay in referral to surgery is 20yrs in adults and 10 yrs in children.
- In 2013 in TBRHSC, 499 patients with diagnosis of epilepsy were evaluated in ED and another 284 patients were admitted with diagnosis of epilepsy.
- Drug resistant epilepsy account for 75% of cost of epilepsy in Canada.

Burden of epilepsy

- People with epilepsy in particular those with poorly controlled seizures, tend to be burdened in the following ways:

  Social stigma
  Mental health and cognitive disability co-morbidity
  Poor school performance, peer relationships
  Higher unemployment
  Inability to drive
  Marriage and family less likely
  Lower educational status
  Higher mortality

Background: Epilepsy in Ontario

- A 2012 OHTAC report by the Expert Panel on a Provincial Strategy for Epilepsy Care identified long wait lists at the province's Epilepsy Monitoring Units (EMUs) and low referral rates contributed to the underutilization of surgical treatment.
- Based on this report, the Ministry of Health and Long-Term Care (MOHLTC) made an investment of 21 new Epilepsy Monitoring Unit (EMU) beds in Ontario, bringing the total number of EMU beds to 39 (26 adult and 13 pediatric).
- The Epilepsy Implementation Task Force (EITF) was formed in June 2013 to develop and implement a provincial approach to an integrated system for epilepsy care in Ontario.
- The EITF has developed a definition of a Comprehensive Epilepsy Program (CEP)

The Epilepsy Implementation Task Force (EITF)

- The EITF works in collaboration with PNO to support equitable and timely access to neurosurgical care, including epilepsy surgery, and to help maintain the province's neurosurgical capacity.

EITF Objectives

- Improving access along the full continuum of care by coordinating resources and wait list.
- Establishing standardized diagnostic and surgical protocols across centers.
- Establishing outreach mechanisms and supports for primary care, community neurologist, and hospitals without specialized epilepsy programs.
- Development of knowledge translation strategy regarding medical and surgical epilepsy care, targeted at primary care providers as well as community neurologist.

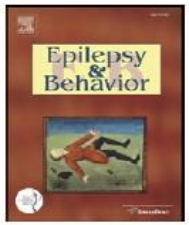
Barriers to epilepsy surgery: patient perceptions

Epilepsy & Behavior 28 (2013) 52–65

Contents lists available at SciVerse ScienceDirect

Epilepsy & Behavior

journal homepage: www.elsevier.com/locate/yebeh



Patient perceptions and barriers to epilepsy surgery: Evaluation in a large health region

Chantelle Hrazdil [a], Jodie I. Roberts [a,b], Samuel Wiebe [a,b], Khara Sauro [a,b], Michelle Vautour [a], Alexandra Hanson [a], William Murphy [a], Neelan Pillay [a], Paolo Federico [a,c], Nathalie Jetté [a,b,*]

[a] Department of Clinical Neurosciences and Hotchkiss Brain Institute, University of Calgary, Calgary, Canada
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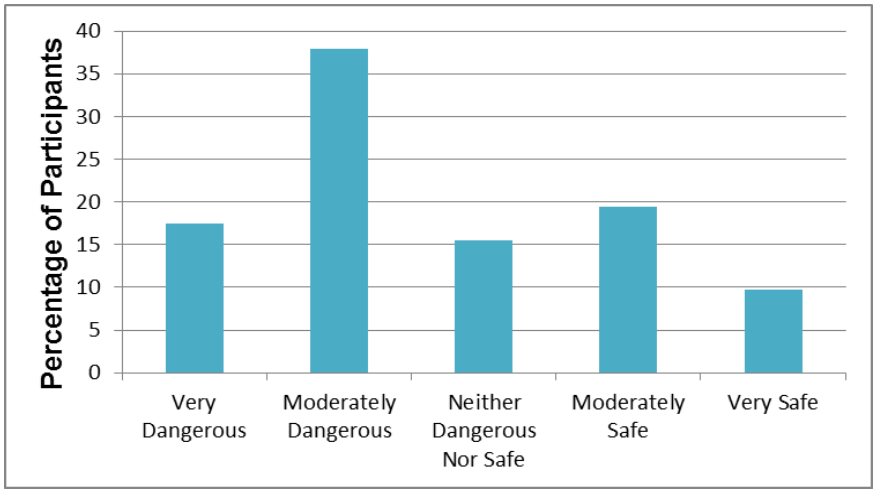
Hrazdil et al, *Epilep Behav* 2013

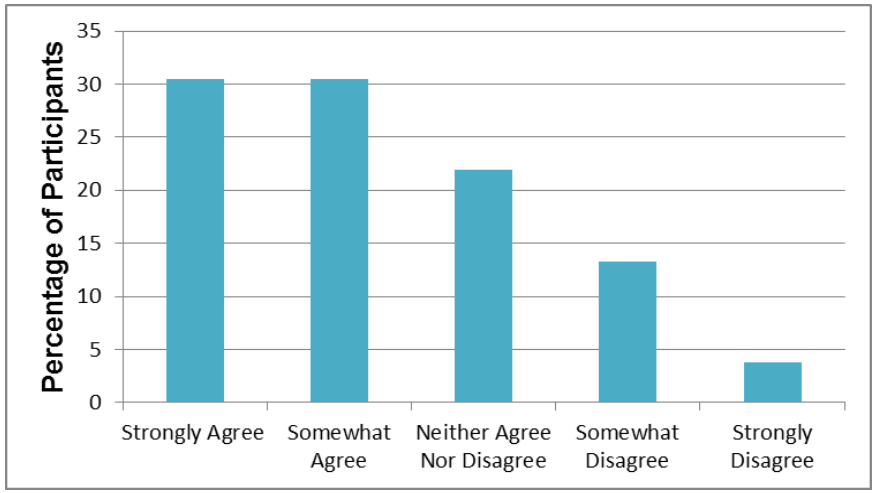
Patients Overestimate Risks

>50%



How dangerous is epilepsy surgery in carefully selected patients?

>60%



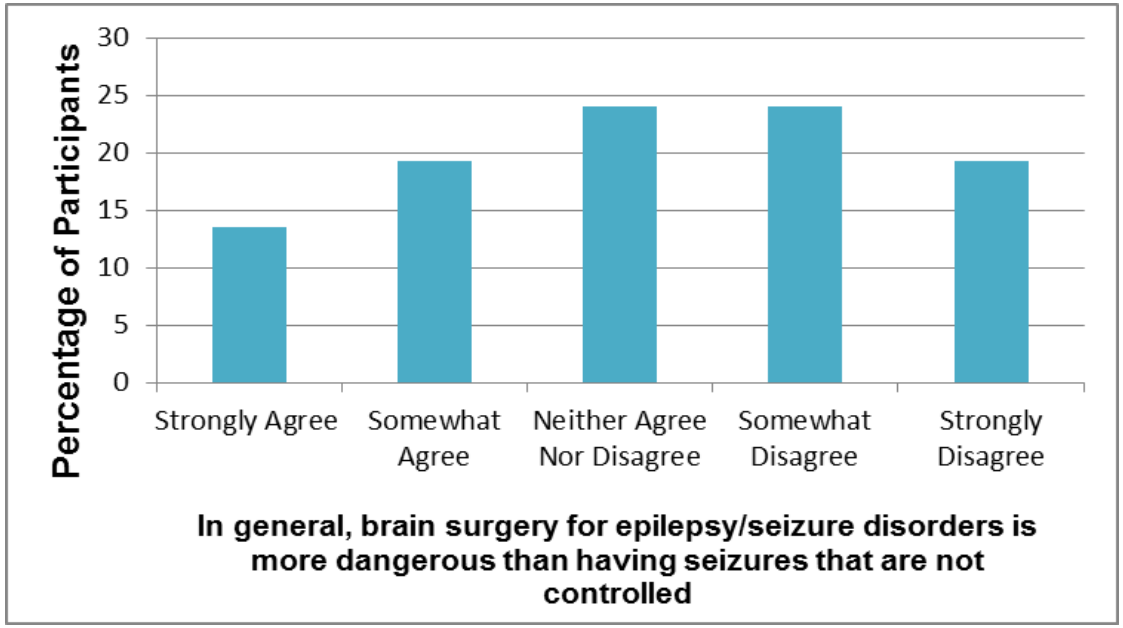
Brain surgery should be considered as a last resort.

Hrazdil et al, *Epilep Behav* 2013

Balancing Risks

33%

Seizures Surgery



Hrazdil et al, *Epilep Behav* 2013

Barriers to epilepsy surgery: patient perceptions

- The majority (>60%) of patients with epilepsy overestimate surgical risks.
- 93% trust their health care providers.
- It is our privilege and responsibility to properly inform patients, dispel myths and allow them to make informed decision about epilepsy surgery.

Hrazdil et al, *Epilep Behav* 2013

EDITORIAL

Who's responsible to refer for epilepsy surgery? We all are!

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Neurology® 2015;84:1–2

Neurologists' knowledge of and attitudes toward epilepsy surgery

A national survey

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Khara Sauro, MSc
Michelle Vautour, BN
Natalie Wiebe
Nathalie Jetté, MD, MSc

Correspond
Dr. Jetté:

ABSTRACT

Objectives: In the current study, we aim to assess potential neurologist-related barriers to epilepsy surgery among Canadian neurologists.

Methods: A 29-item, pilot-tested questionnaire was mailed to all neurologists registered to practice in Canada. Survey items included the following: (1) type of medical practice, (2) perceptions of surgical risks and benefits, (3) knowledge of existing practice guidelines, and (4) barriers to surgery for patients with epilepsy. Neurologists who did not complete the questionnaire after the initial mailing were contacted a second time by e-mail, fax, or telephone. After this reminder, the survey was mailed a second time to any remaining nonresponders.

Results: In total, 425 of 796 neurologists returned the questionnaire (response rate 53.5%). Re-

Barriers to epilepsy surgery: Neurologist knowledge and attitude

- 425 Canadian neurologists answered a questionnaire of which 327 followed people with epilepsy in their practice.
- ~50% were not familiar with current clinical practice guidelines for temporal lobe and localized neocortical resections from the American Academy of Neurology.
- ~20% viewed epilepsy surgery as a last resort for patients with epilepsy.
- Resource limitations were identified as the biggest barrier to epilepsy surgery.

Roberts et al, *Neurology* 2015

Barriers to epilepsy surgery: Neurologist knowledge and attitude

- 51% neurologist in Canada correctly defined drug resistant epilepsy compared to 14% in Michigan and 18% in Sweden. 68% Swedish neurologist defined it as >1sz/mon.
- 54% of neurologist in Canada would refer patients with drug resistant epielpsy for surgical evaluation compared to 3% in Michigan.

Provincial Comprehensive Epilepsy Care in Ontario:

A Novel Regionalized System of Care
and
Provincial Treatment Guidelines for Primary Care Providers

Critical Care Services Ontario
Epilepsy Implementation Task Force

CCSO Critical Care Services Ontario

www.critcalcareontario.ca

Go to toolbox library

PROVINCIAL EPILEPSY MONITORING UNIT (EMU) GUIDELINES FOR ONTARIO

Epilepsy Implementation Task Force

Version 1.0 | Critical Care Services Ontario | January 2014

CCSO Critical Care Services Ontario

PROVINCIAL GUIDELINES FOR THE MANAGEMENT OF EPILEPSY IN ADULTS AND CHILDREN

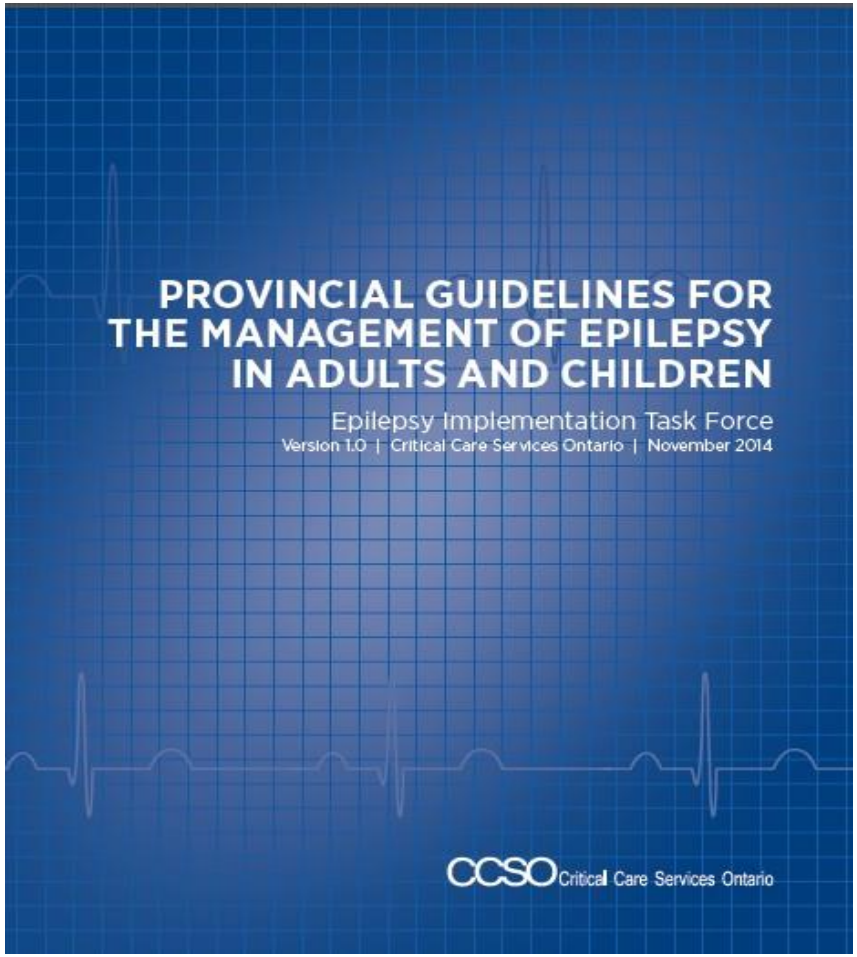
Epilepsy Implementation Task Force

Version 1.0 | Critical Care Services Ontario | November 2014

CCSO Critical Care Services Ontario

Guidelines for Managing Epilepsy in Adults and Children

- Target audience includes family physicians, nurse practitioners, pediatricians, internists, emergency physicians, community epilepsy agencies and neurologists.
- This should be shared with anyone involved in the care of patients with epilepsy.



PROVINCIAL GUIDELINES FOR EPILEPSY SURGERY REFERRALS IN ONTARIO

Epilepsy Implementation Task Force

Version 1.0 | Critical Care Services Ontario | September 2015

CCSO Critical Care Services Ontario

Additional Provincial Epilepsy Guidelines

- **Provincial Guidelines for the Management of Medical Refractory Epilepsy in Adults and Children who are not candidates for Epilepsy Surgery** Approach to the management of the patient with medically intractable epilepsy in whom surgical treatment is not an option.- 2015

- **Provincial Guidelines for Regional Epilepsy Surgery Centers of Excellence** Provide criteria for Regional Epilepsy Surgery Centers of Excellence in Ontario. -2015

- **Provincial Guidelines for Transitional Care of Pediatric Epilepsy Programs to Adult** Guidelines for pediatric and adult practitioners to assist in the seamless transition of epilepsy care for adolescents who are departing the pediatric system and entering the adult health care network.-2016

Thank You