John is a 35- year-old male who was referred to a neurologist by his doctor. About 5 years ago, he suffered a concussion as a result from a fall from a ladder. John works as a painter. John did not experience any further neurological problems until about 2 weeks ago when he reported experiencing a strange sensation, followed by a tonic-clonic seizure lasting around a minute. The neurologist diagnoses John with epilepsy and initiates treatment with antiepileptic drug therapy. John is started on a dose of phenytoin PO (oral tablets, 300 mg) daily. After several weeks, John has another tonic-clonic seizure and phenobarbitone (150 mg PO) is added to the treatment program. About 4 months after starting the treatment program, John complains to his regular doctor that his gums seem to be increasing in size and covering more of his teeth. He thinks it might be related to his medications and makes an appointment to see his neurologist. 1.

What factors are known to be related to causing secondary epilepsy? Which factors relate to John’s case?

2. Discuss the mechanism of action of phenytoin and phenobarbitone (discuss what happens at the molecular target level and how this reduces the incidence/frequency of seizures).

3. Which medication could be responsible for John’s gums increasing in size? Discuss the common adverse reactions of John’s medications.

4. Why should John be advised to avoid alcohol when taking his medications? Discuss the mechanism of action of alcohol and how these mechanisms interfere with the actions of Anti-epileptic drugs.

**Please use 5-6 peer reviewed journal articles to support the case study**