Hi Reddit.

My name is Sumeet Vadera and I am Director of Epilepsy Surgery at University of California, Irvine. I did my Neurosurgery and Epilepsy Surgery training at the Cleveland Clinic. Here is a link to my profile page [http://www.ucirvinehealth.org/find-a-doctor/v/sumeet-vadera/](http://www.ucirvinehealth.org/find-a-doctor/v/sumeet-vadera/).

Here are some aspects of my career that might be interesting to the Reddit community -

1) As an epilepsy surgeon, we have a variety of surgeries that we perform that can be broken down into diagnostic and therapeutic procedures. Diagnostic procedures require implanting electrodes within the brain to localize where the seizures are coming from. I have written several papers that have to do with this technique [http://www.ncbi.nlm.nih.gov/pubmed/?term=vadera+s](http://www.ncbi.nlm.nih.gov/pubmed/?term=vadera+s). I also have a neurosurgical robot at UCI that helps me perform these surgeries and they recently wrote about the robot and our surgeries in the OC Register [http://www.ocregister.com/articles/brain-650683-device-surgery.html](http://www.ocregister.com/articles/brain-650683-device-surgery.html) Therapeutic procedures are performed after we know where the seizures are coming from and these include resections (temporal lobectomy, hemispherectomy, etc) and implantation of neurostimulators.

2) I wrote a paper that was published last month in Journal of Surgical Education looking at “National Incidence of Medication Error in Surgical Patients Before and After Accreditation Council for Graduate Medical Education Duty-Hour Reform.” This is something that has never been looked at before and has some really interesting results. We showed that since the 80 hour Duty Restriction for resident training, there has been a spike in medication errors within teaching hospitals. [http://www.ncbi.nlm.nih.gov/pubmed/26089160](http://www.ncbi.nlm.nih.gov/pubmed/26089160)

3) We use high tech tools to treat patients with epilepsy. I have robots, lasers and neurostimulator devices that assist me in treating patients who have epilepsy that fails medications.

I'll be back at 3 pm EST (12 pm PST, 9 pm UTC) to answer Ask me anything about about epilepsy surgery, neurosurgery in general, or residency training.

EDIT1: Finished my case early today, I'm here to answer questions now. EDIT2: Dr Jack Lin, Director of Epilepsy Neurology at UCI has joined me to answer questions related to the neurology side of epilepsy surgery. EDIT3: Thank you for all the great questions, I hope this was helpful for everyone. I will check tonight if there are any more questions so keep them coming. Feel free to email me at sumeetvadera1@gmail.com. We also are doing some exciting research at UCI and we are always looking for good people to get involved. Feel free to contact me about that as well.
After having my last cranioplasty people say I look and act the same as before my attempted murder. I am very lucky not to have come out severely disabled, and I recovered spontaneously once I regained consciousness. In fact I was on a computer typing e-mails within two days of waking up, and refused to ever touch a walker, they kept me in Brain Rehab for less than the government mandated time.

Obviously, I have an insanely high chance of developing epilepsy (the treatment-resistant kind too!) but I've made it to two years so far, and at three according to my research I'm essentially in the same risk rubric as the average person (though the risk lasts 20 years).

I ask this because when I read subreddits like /r/TBI and /r/epilepsy, and see many people suffering from illnesses and cognitive issues I was lucky to avoid, I would also love to see these people have more hope for a better future.

A future beyond neurosurgeries where things like electrodes are attached to their brains or pieces of the brain are amputated. Cranectomies and Craniotomies are not fun to experience.

I apologize if this is poorly written or too aggressive, but it'd mean a lot to have some good hypothetical outcomes discussed especially as it seems the recent global trend is that we are in fact seeing a massive flood of investment money being injected into future med tech and neuro-medicine.

I agree with u/CivilityBeDamned, your question was very well written and very thoughtful. In terms of research, there is a great deal of work being done on TBI and its association with epilepsy. There are a lot of difficulties with this research in general, one of the biggest ones is that people react to TBI very differently as you mentioned. For instance, why is it that if two people have the same TBI/stroke/brain tumor/brain surgery one might go on to develop epilepsy while the other does not is a very important question and one that has currently eluded us. There are likely many reasons for this including genetic make-up, type of injury and location, etc that make this research very difficult. I think as more money goes into research and more people investigate the underlying causes, we will see in the next five to ten years new devices and treatment options that may avoid surgery.

As someone performing robotic-assisted surgeries, what is your opinion of telesurgery for the future of medicine? Is the risk of interrupted surgery worth the potential benefits of having the expert(s) working on a patient regardless of location?

It still seems like robotic techniques have a bad rep amongst the general public in the United States. What percentage of your patients opt-out of having the robotic-assisted surgery? What are their reasons for doing so?

Great questions! 1) There is a lot of potential in the future for telesurgery in epilepsy surgery. There are also opportunities from the neurology standpoint to read electroencephalograms (EEGs or brain wave studies) that are performed at remote locations by neurologists at main epilepsy centers. Similar options are available for epilepsy surgery planning and implantation of electrodes. I foresee a time in the not-too-distant future where people will have implantation of electrodes to localize their epilepsy done in remote locations that may not have systems in place to read these studies and large centers across the world will be evaluating and diagnosing the cause of the epilepsy. 2) The robot we use in neurosurgery is different from the one that is used for most body surgeries across the United States. This is actually the only robot that is FDA approved for neurosurgery procedures. Here is a link about the robot we have here at UCI http://www.ocregister.com/articles/brain-650683-device-surgery.html
During neurosurgery, the definition of margins is a huge problem. Underestimations can leave diseased tissue and overestimation unnecessarily removes functional tissue to the detriment of the patient. What strategies do you employ to limit the removal of healthy tissue during resection or laser ablation? Are there any techniques (e.g. fluorescent labeling, targeted nanoparticles) being developed in the lab that seem promising in the surgical environment?

shiruken

Dysplastic, or abnormal, brain often feels very different than normal brain during surgery. I use this as one method to assess whether or not the diseased portion of the brain has been removed intraoperatively or if there is more work to be done. One thing to remember is that region of the brain we are taking out in epilepsy surgery is abnormal and is causing the seizures. Unlike tumor surgery and other neurosurgeries where you want to disrupt as little surrounding tissue as possible, in epilepsy surgery you want to increase the chance for seizure freedom by taking as much of the part of the brain causing the seizures out as is safe. One thing I hope people take from this AMA is that Epilepsy Surgery is a very safe surgery that changes people's lives and that it should not be kept as a last resort.

I used to have petit mal epilepsy. Eight years ago I had surgery to remove a scar on my right hippocampal temporal lobe, since then I have had no seizures. I appreciate that you mostly implant electrodes but how far-reaching is surgery like mine which directly removes or modifies the piece of the brain which is causing seizures?

Another question I had: One neurologist I visited did suggest implanting an electronic stimulus device in my brain but it had to be activated by me when I felt a seizure coming. While some people get a signal like a metallic taste in their mouth before a seizure I did not get any such indication so it wasn't viable. That was 10 years ago, nowadays are their devices which can detect when a seizure is about to occur so that it can activate itself? Do you think it is likely that we will develop that kind of device or are brains too complicated to predict seizures?

thai_tong

About half of the surgeries I do are diagnostic procedures where we implant electrodes onto the brain and the other half are resective surgeries such as the one that you had done. That is awesome that you are seizure free, that is the goal of all these surgeries we do. We now have a new device called the neuropace, which is similar to what you are describing. We implant electrodes on the brain in the area of the seizures and it works similar to a pacemaker of the heart. It constantly listens for seizures and when it sees one starting, it sends an electrical impulse to that area that stops the seizure from going forward. I implanted many of these in my residency with my mentors Dr. William Bingaman and Dr. Jorge Gonzalez-Martinez and I have also performed many of these here at UCI. This is a great option when people have seizures in parts of the brain that can't be resected.

Hi! I've had epilepsy since I was 7 and I'm in my mid-20s now. It's controlled with medication (Lamictal, Zonegran, and Ativan as needed), but I still have some seizures every now and then.

Is surgery an option for me? I ask because the idea of taking 5 pills a day every day for the rest of my life is daunting and the side effects aren't fun to deal with.

I'm also wondering if there's any kind of link between Epilepsy and Bipolar disorder. The latter runs in my family, but I'm the first one to be diagnosed with epilepsy (and not diagnosed with bipolar)...then a few years later, my cousin was also diagnosed. It just seems odd to have no history of seizures and then get two in one generation.

Thanks for the AMA!
AnnonMiss

Dr Lin, Director of Epilepsy Neurology at UCI, says bipolar disorder is a known comorbidity of epilepsy but it is still not known whether there is a causal relationship between the two. In terms of whether epilepsy surgery is an option, the best way to learn what options are available to you are to be evaluated at a Level 4 Epilepsy Center. Epilepsy surgery requires a team approach and these centers have all the aspects of the team and are able to provide all the latest surgical options available if they feel you are a candidate.

My son is autistic with very prominent OCD. Some Doctors have confused his speech patterns with petit mal but that is not what it is I think. Its seems a product of OCD which from all I have read is likely a neurological dysfunction involving repetitive neurotransmitter transmission or release due to a problem with the self regulating feedback mechanism which usually functions to counteract the release of the neurotransmitter or deactivates the receptors or whatever it actually is. I am not an expert at all in this area but it seems there might be similarities clinically or functionally in this kind of disorder and epileptic neurology. Do you have any thoughts on this speculative connection? I would give a lot to help my son at least partially break out of this common autistic repetitive cycle which in his case can be quite severe. None of the usual SSRi's or psychoactives etc. seem to help and some have made it worse. He is under the care of a DD team and lives with 2 alternating 24 hour caregivers in his own apt.. In his case one has to take into account the potential negative effects of more testing with the potential benefits. His psychiatrist wanted to evaluate him for petit mal, which myself and his care team think is a misread. I have said I would prefer that be done by a neurologist if done. Its is in abeyance. His DD team psychiatrist has not been with him long or seen him that much. No other of his many MDs have suggested epilepsy. He is 33 years. Sorry for long post.

Krakatoa12

Approximately 50 percent of people with autism or developmental disorder have epilepsy. So it is worthwhile to rule out seizures with Eeg. A neurologist would be ideal to evaluate whether these are seizures. They may have him undergo scalp-EEG testing to see if these episodes are seizures.

Hi, a question from Europe about your second work. What was exactly that 80 hr regulation? Did they increase shifts to 80hrs/ week? Why did they do that? Wasn't an increase in errors expected?

lucaxx85

This is a great question and thanks for asking about this. The first set of duty hour regulations were set in place in 2003 because residents were working too many hours in the hospital (some were working >100-110 hours per week). The hours were reduced to 80 hours as a means to avoid resident fatigue and decrease errors that occur from sleepiness. Many people say there have been a lot of unexpected side effects from this duty hour restriction. We wanted to see what happens in teaching hospitals before and after the 80 hour work week, expecting that medication errors would go down. Surprisingly, we found that there was an increase in the medication errors in teaching hospitals after the introduction of the duty hour restrictions that continued for several years. We used the NIS database which allowed us to study national trends in teaching hospitals when compared to non-teaching hospitals.

Thanks for doing the AMA. There are definitely a lot of questions I have about epilepsy, which I've had since I was 15 (I'm now 28).

I have gone through a 2 year phase in which I have had no seizures and was free of medication. Then,
the seizures returned, and they returned hard. I was having multiple seizures a week, despite taking Lamotrigine. What concerned me was that when I asked my neurologist how the drug operated in controlling seizures, he just said that he doesn't know; it just does. What goes into the process of selecting the correct type of medicine? I switched neurologists and the new one added depakote to my regimen, which controlled my seizures completely (I've been seizure free for over 2 years now). How is it that physicians do not even know the general operation of a medication?

Out of curiosity as a researcher myself, what is the current state of research on epilepsy. It seems like the majority of work on neurological disorders focuses on things like MS, Parkinson's, and Alzheimer's. How far along are we moving to discovering more about this type of condition?

I have heard of a potential link between migraines and seizures. Although there's no one else in my family with epilepsy, my mom suffers from intense migraines from time to time. Is there actual evidence to support this idea?

I know this is a little off the topic of neurosurgery, but I'm wondering if you have any insights on this.

NoSurfinMovie

It is not unusual for someone to have well controlled seizures for several years then have seizure recurrence. This is especially true for temporal lobe epilepsy with hippocampal sepsis and has been termed a honeymoon period. Given that you have failed multiple medications, you probably should be evaluated for possible surgery! I was recently at the American Epilepsy Society Meeting and there is a lot of very exciting research being done to understand epilepsy and treatment options available. I think one of the most exciting aspects of epilepsy surgery is that patients undergoing invasive electrode monitoring are often very interested in being involved in research and they offer us a glimpse of how the brain works that we can't get with any other type of surgery.

Here is some data about the prevalence of migraines in epilepsy patients. Epilepsy in patients with migraine is 5.9% vs < 1% in general population, epilepsy patients have higher life-time prevalence of migraine. Epilepsy Family Study found patients with epilepsy have a 2.4 times greater rate of migraine than family members without epilepsy.

Hey there - I don't know if this is alright to ask, but I'll try it since you would know. My girlfriend is in her early 20's, with late onset epilepsy (she had some drug use in her late teens, which I think contributed). We also live in Orange County! Small world.

She has grand mal seizures, presenting usually from 2 at a time to the highest of six at one time. She's currently on a mix of medicine, with a relatively successful control rate. She's had multiple MRIs and other scans that show no abnormalities in her brain. Is that unusual?

I guess my questions are three. One, are multiple seizures indicative of anything worse, or a progression of epilepsy? I wonder if it will kind of 'cap' at a certain point.

Two: Is there anything other then medicine that can help (such as the ketogenic diet)? When is surgery necessary over other options?

Three: What can I do to help her? It's pretty awful to see it and I wonder what is possible to help reduce or eliminate the issue.

Thank you! I am sorry if this isn't the proper line of questioning.

mcrninja

Thanks for the questions, how do you like the rain in OC right now, better than snow I guess There isn't any cap on seizures in patients with epilepsy, I have seen babies with epilepsy that can seize over 100
times per day. Having multiple sz suggests that there's a progression. The goal is to be sz free and therefore they is no cap. Multiple continued seizures are a sign that her epilepsy is not well controlled with medications and that might mean that she should be seen by an epileptologist or that she should potentially be evaluated at a level 4 epilepsy center where new techniques and tests are available that might localize where her seizures are coming from. Ketogenic diet is an option but this has to be done in a specialized center I think the best thing you can do is to support her and get more information like you are doing today. I would strongly suggest having her be evaluated at an epilepsy center as there may be options available for her.

Hello Dr. Vadera,

I have a few questions in regards to my sister, who developed epilepsy when she was 11. We were hoping that she would outgrow it however when she was being slowly taken off her medication in 2014 after a few years of inactivity she had a grand mal seizure. She is currently back on medication again and they have worked perfectly (lomictol and keppra).

My questions would be:

Is this chip effectively a cure for all epilepsy or specific kinds?

Is there any chance she might grow out of it within her middle 20's? (She just turned 21 in October).

She's currently stopped taking Lomictol because of recent health concerns discovered if she ever wants to have children and have increased her dosage of keppra. Are there any known side effects with Keppra and reproductive issues?

Thanks for doing this AMA!

pepperdish

I'm not sure what the chip is, please explain. It depends. If her EEG is abnormal showing epileptiform dc, then she likely will need remain on medication. The recurrence of seizure is a poor prognosis but if she remained seizure free for 2 years, then it is worthwhile to get another EEG and reassess. Although all seizure medications have an increased risk for fetal malformation and cognitive side effects, Lamictal and Keppra carry lower risk than others. Depakote probably carries higher risk.

Is epilepsy caused by damaged dendrites?

creditcardplease

Dendrites are a part of neurons which are cells that communicate with one another through electrical activity. I would not say that they cause epilepsy. Instead, epilepsy is a very complex disorder of the brain that has many underlying causes such as cortical dysplasia (abnormal brain tissue formation), tumors, strokes, trauma, and a variety of other causes. Some epilepsy causes the entire brain to have seizures at one time (generalized) while others are caused by a small region of the brain. The first line of therapy is always medication and if that controls seizures then that is all that is required. If seizures are poorly controlled and multiple medications have been tried, then we call this medically refractory epilepsy and the next step should be to be evaluated at an epilepsy center where surgery is one of the options if you are deemed to be a candidate. Unfortunately, epilepsy surgery is woefully underutilized in this country and there are several reasons for this including patient/care provider anxiety related to undergoing surgery.
What is your experience with Hemp oil to reduces the number of seizures?

maximuszen

CBD/THC is being studied in a multi center trial and the preliminary data suggest that it’s anti epileptic effect is similar to another medication with reductions in the range of 30-50% in a very refractory form of childhood onset epilepsy. It is important to note that CBD can interact with existing medication and patients have been found toxic on seizures medications because of this interaction. I was recently on PBS Studio SoCal where we discussed some of the points associated with CBD as well as epilepsy surgery. http://video.pbssocal.org/video/2365447887/

What is the average age for a patient to have surgery? Do the ages vary greatly or do most tend to be within the same age bracket?

Also, what is the typical time needed for a patient to heal? When will someone get out of the hospital, return to their job, regain mental abilities, or finally report becoming pain free?

Lastly, what is the weirdest phrase or sentence a patient has said after surgery? The drugs used during the operation coupled with the effects from having a brain prodded must result in some spectacular thoughts.

When I was nearly 16 I had brain surgery to prevent nocturnal seizures. It has been two years now and I am still epilepsy free. I have wretched migraines daily and still have troubles with memory but it is still better than slamming my face into a headboard or dislocating my joints while I sleep. I either laugh or cringe when I remember what I said those first few days after waking. I'd wanted to know when The Beatles started World War 2 and apparently my arms were whispering to me a lot. I am eternally grateful that neurosurgeons exist and like to joke that natural selection would have killed me off if it wasn't for you

AiyaBowman

Great question! Patients of all ages have epilepsy and so surgery is offered at any age. I have done surgery on infants as well as patients in their 60s and 70s. Patients with epilepsy are often healthy and so unless they have other comorbidities that prevent surgery, we don't have a cut-off. Patients usually are discharged home on Day 1 or 2 after resective epilepsy surgery. If they have invasive electrodes implanted to localize the seizures, they are admitted until we are able to find the region of seizures, this is around 7 days, but can be from 3 days to 4 weeks depending on how long it takes to have seizures. I have had a few patients ask me if they were still alive when they wake up, I'm always happy to say yes. One more thing, people have all sorts of perceptions of epilepsy surgery that I want to dispel. 1) You don't have to be awake for these surgeries, we do awake surgery but it is uncommon 2) We are removing parts of the brain that are abnormal and not functioning correctly, we avoid taking out normal tissue 3) These surgeries are very safe, risks are extremely low, especially at high volume centers such as ours 4) You should be able to walk and talk after surgery just as well as you did before, if you didn't play the piano before surgery, it's unlikely you will be able to do it after surgery :) Congratulations on being seizure free! That is great news!

How common is epilepsy in twins?

simplyatomic

A study by Dr. Berkovic and colleagues showed: Of 558 twin pairs, 418 had confirmed seizures. A total of 534 twin individuals were affected. There were higher twin concordance estimates for monozygotic (MZ) than for dizygotic (DZ) twins for idiopathic generalized epilepsies (MZ = 0.77; DZ = 0.35), genetic
epilepsy with febrile seizures plus (MZ = 0.85; DZ = 0.25), and focal epilepsies (MZ = 0.40; DZ = 0.03).
Utilizing the 2010 ILAE scheme, the twin data clearly demonstrated genetic influences in the
syndromes designated as genetic. Of the 384 tested twin individuals, 10.9% had mutations of large
effect in known epilepsy genes or carried validated susceptibility alleles. (Neurology. 2014 Sep
16;83(12):1042-8.)

My son has small seizures about 3 times a month. Sometimes passing in seconds other times lasting a
minute. They are often small enough that he is conscious he is having one (he is on Keppra). Early we
thought he had absence migraines until on our second neuro tests he had a seizure while being
monitored on EEG.

This may sound odd, but we noticed they tend to happen more often when he hasn't had a bowel
movement (BM) in a while or he had a difficult BM just prior to the seizure.

I wish I could pinpoint it better but it has been like this since he was maybe 5-6 and he is 14 now. We
are hopeful he will outgrow it.

Is there any known connections with Epilepsy and what's happening in the gut? Could the stress of not
having a BM lead to physical symptoms that might preclude a seizure?

warbeats

Seizures can be brought on by a variety of different stresses on the system including lack of sleep,
overexertion, pain, and alcohol. I am not sure if that is what is happening in your son's case but I would
suggest that you discuss this with his epileptologist and perhaps keep track of how often this occurs to
see if there is really a correlation.

What is your opinion of CRNAs?

WhileYouWereSleeping

I have lot's of good friends that are CRNAs, I think they are great!

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Dr Lin has seen Swagman often on campus but doesn't know him personally. Indeed his swagger is
very cool.