How to prepare for EEG in an outpatient setting
Barbara Walsh, Supervisor, Outpatient EEG

Hello, my name is Barbara Walsh, and I am the Supervisor of the Outpatient EEG Lab at the Cleveland Clinic which is located at the Main Campus in Cleveland, Ohio. If your Physician requests that you or your family member have an EEG, I want to prepare you for the procedure, answer questions, and allay any fears you may have.

EEG is an abbreviation for “electroencephalogram”, which is a recording of the electrical activity generated by the neurons of the brain. We do EEG testing for various reasons; which include epilepsy, syncope or passing out spells, and mental status changes. Often times teachers will describe staring spells in school, and the pediatrician will order an EEG to determine if these are brief seizures. If you are consulting with a doctor here at the Clinic, we make every attempt to schedule the EEG prior to the consult so that your test may be looked at before. The test will be officially read by the end of the day that the test is performed.

If you are sent by a physician outside of the Cleveland Clinic Health System, the report will be mailed to this referring doctor. If your doctor requests the results sooner, he can call. I will be happy to fax the results.

I want to familiarize you with the desk you will be checking in which is S51, as well as the team of EEG Technologists that will be performing your exam. This group of technologists has the expertise and techniques to perform EEGs on all age groups and difficult cases as well. They are very “child friendly”, and make every attempt to communicate to the patients exactly what they are doing.

Since all patients will not be able to understand what is happening, you may hear crying or signs of discomfort when passing through our hall, but please understand that the test does not hurt at all. I will go through instructions you must take in preparation for the test, then the steps we take in the actual performance of the EEG.

Your hair should be clean and free of hair spray, oil, tonic, or hair weave. Do not stop taking your prescribed medications unless specifically told to do so by your physician. We make every attempt to obtain a natural sleep recording, so do not consume any caffeine containing beverages the morning of the test, which include coffee, tea, cola, and chocolate drinks. The night prior, try to sleep 2-3 hours less than usual, unless sleep deprivation has triggered a major or severe seizure in the past .If you are able to be sleep deprived, please bring a driver along for your safe arrival and trip home. If you have a DBS, please bring your magnet. In an effort to stay on schedule, if you are late for your appointment we may need to reschedule.
We encourage parents to bring any special small stuffed animal, blanket, or music recorder that may serve as comfort for your child. The technologists will have you lying down on a hospital bed that rises so that they can easily work on the head. A rolled pillow will be placed under the head to raise the head slightly so they can view the head from all angles. They will then begin to measure the head with a regular cloth tape measure and make marks on the head with a wax pencil. These marks are very specific to each individual's head size and are the places that the electrodes will be applied onto. This system is used internationally and is called the 10-20 system of electrode placement.

The test is run on a computer that looks like the ones you have in your own homes and schools. We will be applying 25 electrodes and two EKG stickers on the chest to measure your heartbeat as well. The electrodes are 48” long and multi-colored with a disc or cup on the end that is attached to the scalp by an adhesive method. This small disc is made of pure silver with gold plating over it. These electrodes are plugged into a jack box that has a cable attached to the computer. In looking at EEG patterns, we compare the left side of the brain to the right side, so these electrodes must be placed very precisely. The application can take between 30 and 40 minutes.

Your doctor may order a Routine EEG or a Multi-hour or longer EEG. For the Routine EEG you will be allotted 90 minutes for the appointment, and this will include the electrode application process, the actual running of the test which is 20-25 minutes, along with the clean up process.

For the Multi-hour test, you will be allotted three hours and the only difference is that the EEG will run for 75 minutes. Sleep is especially important in this recording since we have such an extended time to record the data.

I want to familiarize you also with the two electrode application techniques that we may be using. The first is the “paste” method. The technologist will first rub a small amount of skin preparation gel on the measured spot using a q-tip. Next we will fill the cup of the electrode with a paste substance that has the consistency of tooth paste and, and then adhere it to the scalp with a cotton ball. This method can only be used on patients that are able to hold still, and only for the shorter exam. The electrodes are more easily displaced with this method if head movement occurs.

I want to show you some photos of this measuring and application process as we do it in our lab. You will see it is harmless, and our patients are relaxed and even smiling.

The second method of application is used when due to patient’s age or medical condition, is unable to keep the head still, or in cases when the longer test is required, and the patient may need to turn from side to side to become comfortable to sleep. The tech will once again prepare the scalp with the q-tip and skin preparation, and then will glue the cup of the electrode to the scalp using a piece of gauze dipped in a chemical called collodion. Collodion has a strong smell of ether, and makes surfaces stick very tightly when air is applied and the glue is dried. The air we use is simply room air with tubing.
attached and a stylet on the end. It is comparable to a hair dryer, but with cool air coming out. Next we must squirt a small amount of pink conducting cream into the small opening in the top of each electrode disc to help in the flow of the electrical activity of the brain. This may seem a bit scary to some since we must use a syringe to squirt in the lotion, but the syringe is only for squirting purposes. We use a blunt tipped needle attached to the end of the syringe, but once again the needle is blunt with no sharpness to it, and has to be used because the hole is very small.

I want to share with you some photos of the process when gluing electrodes is used.

After all this preparation, we are now ready to run the EEG. The room will be made dark, quiet, and door closed to promote relaxation. The tech will tell you everything that will happen before it is performed.

There are three activation techniques that we try to do on all patients. These procedures are done to attempt to bring on a typical seizure or event that brings you in for diagnosis.

In certain patient populations that are predisposed, photic stimulation and hyperventilation may actually bring on the typical seizure.

During photic-stimulation, the tech places a lamp over the eyes, and asks that you keep your eyes closed. A light will begin to flash, starting at faster rates of speed and slowing down progressively. At the end we will have you open and close your eyes and end with one faster frequency. Despite the eyes being closed you will be able to see the flashes, and perhaps different colors or patterns through your eye lids. If we obtain a positive response in the form of a jerk or twitch the light will be turned off immediately.

Another activation procedure we use is hyperventilation or a deep breathing exercise. If you have any history of heart or breathing difficulties we may omit this portion. We simply ask you to take faster and deeper breaths for 3-5 minutes, blowing in and out through your mouth. You may experience dizziness or lightheadedness, but this is a normal response and will diminish a couple minutes after completion. For smaller children this exercise is also important, but we may ask the child to blow on a pinwheel or blow bubbles since this actually gives us the same results. Once again certain patient populations may actually have a seizure or produce brain wave abnormalities with this activation, and we will discontinue if this occurs.

Now we are ready to exercise the third type of activation which is natural sleep. I call sleep an activation because an EEG may show totally normal brain waves until sleep is obtained, and the abnormality may manifest itself. The technician will alert you at the end of the allotted time and ask several questions to make sure you are awake and alert. This is what we call mental activation. Our brain waves look different when we are awake, asleep and drowsy. We need to prove to the physician analyzing the test that our patient is fully awake. For help in the analysis process, our EEG machines are equipped with digital video recording so that the Doctors can correlate brain activity with the patient’s clinical manifestations.
Now we can begin with the lead removal and clean up process. We make every effort to remove all remnants of any of the adhesives used from the hair and scalp. If we used the paste and cotton ball method, the clean up is rather easy. This paste is water soluble and we wash it out with a cloth using warm water and combing through the hair. Shampooing will further remove it once you are home. If we had to use the collodion method, we will need to use acetone for the removal. Women may recognize the smell of acetone since it is present in finger nail polish remover. This odor is also quite strong. For the babies and smaller children we also have a non-acetone remover which requires a litter more scrubbing and has an oily base to it.

I hope I have covered the important steps in this process as clearly as possible. Please feel free to ask your EEG technologist any questions that may arise during the actual exam. Everyone in the Epilepsy Center welcomes you, and will be happy in making your testing process here as smooth as possible.