

Post-patch Instructions- Practical Issues:

Staying flat for 3 days:

We recommend that you remain flat for 72 hours after your epidural patch. This means that we would like your head no higher than your hips for 72 hours except when you go to the bathroom, and when you are driving home. You may lie on your back, on your side, or on your stomach. Imagine that your dura and spinal fluid are like a 3 foot length of garden hose that is capped at both ends and full of water. If you poked a fork through one end of the garden hose, fluid would leak out at a high rate when the garden hose is held vertically, but only very slowly when the garden hose is held horizontally. In addition, if you put rubber cement over those fork holes (analogous to the clot formed by the blood patch) but held the garden hose horizontally your chance of sealing the garden hose would be much better than trying the same procedure with the garden hose held vertically.

After the first 3 days:

You may be up and about doing your normal activities of daily living. However for the first 6 weeks while the patch is getting stronger we would like you not to stretch, go to the gym, exercise, or lift anything heavier than a gallon of milk.

Managing post-patch spine pain:

Blood or fibrin glue surrounding the bag of fluid and nerve roots is irritating and will cause spine pain and occasionally pain and pressure radiating down your legs or arms.

Some people do not have very bad back pain after an epidural patch and can manage with Tylenol and ibuprofen (which can be taken safely together). However many people require stronger pain medicine such as Norco, Vicodin, or Percocet for 4 or 5 days.

Note that many pain medications such as Norco or Vicodin or Percocet contain some amount of acetaminophen (the active ingredient in Tylenol). It is important that you keep your overall consumption of acetaminophen to less than 4000 mg per 24 hour period. That means if you take an extra strength Tylenol (500 mg of acetaminophen) then you can only take as much of your pain medicine as allowed to keep the overall amount of acetaminophen from your pain medicine less than 3500 mg.

Some patients find cold packs helpful and it is fine to use these as well. Most patients tell us that the back soreness peaks approximately 3 days after the procedure and then gradually diminishes. While back pain and some pain radiating down the extremities is not uncommon you should not have weakness. True weakness is a sign of a problem and should be evaluated in the emergency room.

Managing post-patch nausea and vomiting:

Changing the pressure in your head from an epidural patch, and the opioid pain medicines such as Vicodin, Norco and Percocet, can both make people nauseated. When you vomit it sends a pressure wave through the bag of fluid that we have tried to patch, and we want to minimize this because conceptually the increased pressure inside the bag could cause the patch to fail and start leaking.

Therefore, your doctor will prescribe you anti-nausea medicine (typically ondansetron/Zofran). If vomiting has been a particular problem for you with other procedures or if you are allergic to ondansetron please discuss this before your patch with your doctor.

Managing post-patch constipation:

Opioid pain medications such as Vicodin, Norco, and Percocet cause significant constipation in some patients. Bearing down with effort in order to pass hardened and constipated stool can increase pressure in the bag of fluid which can cause the patch to fail and start leaking again. Therefore we recommend that if you are requiring these opioid pain medications to manage your pain that you simultaneously take MiraLAX to keep your stool soft. This is an over-the-counter stool softener that can be bought in the pharmacy as a powder. You mix the powder with a full glass of water and take it each day that you are on the opioids. In some cases a Dulcolax suppository can be helpful to promote a bowel movement without excessive pushing.

Managing post-patch headache:

Increased headache following an epidural patch is possible in two principal situations: 1) worsened low pressure in the skull or 2) the opposite problem- high pressure in the skull (rebound intracranial hypertension).

Worsened low pressure may be caused by disruption of the dura from the blood tracking between different tissue planes, or alternatively, we may inadvertently pierce the dura with our needle during the patch resulting in a worse leak. We believe this happens between 1% in 5% of the time. This kind of headache will be very much like the original kind of headache, but more severe. In other words the headache is typically much better when you are flat, and much worse when you are upright. With prolonged upright activity the headache will get progressively worse and nausea and ringing in the ears may also get worse as well.

Rebound intracranial hypertension: A number of investigators have noted that following the sealing of long-term CSF leaks that many patients develop the opposite kind of problem with increased pressure in their head and spinal fluid. It is thought that in response to a long-term spinal fluid leak, the brain markedly increases the normal production of spinal fluid, and when the leak is suddenly sealed this fluid can build up and pressurize the bag of fluid even more than normal. This results in a period of time in which patients have elevated pressure in their spinal fluid. This is thought to usually be a transient problem, although it is clear that some people who have been leaking for a long time can have elevated pressure for a long time as well. The clinical signs of this problem are that in contrast with a low pressure headache from before the patch, the new high pressure headache feels significantly worse when the patient is flat. In addition, because CSF pressure is often maximal at approximately 3 AM, patients may awaken from sleep in the early hours of the morning with increased head pressure. In addition patients often get relief from medications which reduce CSF pressure including: acetazolamide (diamox), amiloride, hydrochlorothiazide (HCTZ), spironolactone, and furosemide (Lasix).

Patients with increased head pain when they are flat following an epidural patch should contact the doctor who did the patch and generally start on acetazolamide (also called Diamox). A starting dose of acetazolamide may be anything from 250 mg twice a day to 250 mg every 6 hours, but generally not

more than 500 mg every 6 hours. Acetazolamide can cause some patients to feel tingling in their fingers, toes, and numbness and tingling around the lips. This is not dangerous and is a common side effect. Acetazolamide can cause an allergic reaction in patients who are allergic to sulfa drugs. If you are allergic to sulfa drugs you should alert your doctor to this before taking acetazolamide. Because some people who are allergic to sulfa drugs can still tolerate acetazolamide, in certain circumstances your doctor will treat with acetazolamide even though a patient is allergic to sulfa drugs.

Assessing success of the patches:

It can take 4-6 weeks for the patch to take its full effect. The success or failure of patches is determined by the degree of symptom improvement in core symptoms of a CSF leak including headache, neck pain, tinnitus (ringing in the ears), nausea and vomiting, difficulty with concentration and memory, and fatigue.

General Information:

What is an epidural blood patch:

The bag of fluid that surrounds the brain and spinal cord that can leak cerebrospinal fluid (CSF) is made of connective tissue called "dura." It is the dura that has a hole when someone has a CSF leak. The dura is surrounded by loose fatty tissue wrapped around the bag. The space containing this fatty tissue is called the epidural space. So when someone has a spinal CSF leak, the fluid typically leaks out of the bag of fluid into this loose fatty tissue in the epidural space. Injecting a patient's own blood into the epidural space in close proximity to where the fluid is leaking out appears to seal the leak for many people. We think this is because the clotting factors in the blood seal the leak. This is called an epidural blood patch.

Questions and problems in the first week after a blood patch:

Dr. XXXXXXX cell phone is XXXXXX. He trusts his patients with his cell phone, but depends on them to use this number responsibly as outlined below. This number should be used for urgent questions the first week after a blood patch, but not used for routine medical questions such as when should I schedule my next appointment, how to make another appointment in the clinic, difficulties with scheduling an appointment in the clinic, difficulties with scheduling patches, or strategic questions like what do we do if these patches don't work. Those other questions should be directed to clinic administration through my health, or held until a follow-up appointment as appropriate.

Follow-up in the pain clinic:

We would like to aim to see patients who have had a series of patches approximately 6-8 weeks following the last patch for follow-up in the clinic.

General information about epidural patches:

We believe epidural blood patches are most effective when they are performed at the same spinal level at which the leak is occurring. Therefore a primary goal of performing an MRI or a CT myelogram is to identify the level of the spine that is most suspicious for being the site of the leak. This kind of epidural blood patch that is directed to the site of the leak is called a "directed epidural blood patch" and is in

contrast to a “non-directed epidural blood patch” in which a blood patch is performed in the lumbar spine without the benefit of any imaging guidance. A nondirected blood patch works for some people, and some papers even advocate performing a series of three lumbar nondirected epidural blood patches prior to attempting a directed epidural blood patch. However, our experience is that a blood patch is more effective if directed to the site of a leak identified with radiology studies such as MRI and CT myelogram. In some cases, when an MRI or a CT myelogram is problematic, we will perform a nondirected epidural blood patch.

Epidural blood patching works via at least two mechanisms. The early, almost immediate, effect is related to an increase in pressure within the bag of fluid when the injected blood surrounds/encircles the bag of CSF at the injected level and has the effect of constricting the bag of CSF which raises the fluid pressure inside the bag of fluid- thereby relieving symptoms temporarily even if the patch has not sealed the leak. This is important because if a patient has significant but only temporary relief from an epidural blood patch it is often an indication that there really is a leak, but that the blood patch has been performed at a level other than where the spinal leak is occurring. There is also a delayed more permanent effect that results from the injected blood sealing the cerebrospinal fluid leak. We believe this most desired outcome is most likely when the blood is injected right at the site of a leak.

When a spinal fluid leak arises from a simple pinhole at a known location such as that made by a doctor’s needle following spinal anesthesia or a “spinal tap” a single epidural blood patch is effective at sealing the leak and fixing the problem up to 90% of the time.

However, when someone has a spontaneous CSF leak (i.e. it hasn’t been caused by a needle poke) the leak itself is usually not from a pinhole but rather is from a longer irregular tear in the dura. If the leak is caused by an irregular tear in the bag of fluid from a trauma or bone spur multiple patches are often required. Some sources suggest that in these circumstances a single blood patch fixes the problem in only 30% of cases. Consequently, most patients who have a spinal fluid leak require more than one epidural blood patch.

Epidural blood patch risks:

Serious adverse effects of an epidural blood patch are uncommon. We think the likelihood of having a spinal cord injury from a epidural blood patch is on the order of 1 in 10,000. This usually arises not from direct needle injury, but rather the occurrence of infection or bleeding behind the spinal cord that then presses on and injures the spinal cord. On the other hand, it is quite common for patients to experience discomfort that is non-dangerous following an epidural patch including back pain, paresthesia’s (numbing tingling sensations in the arms or legs), and low-grade fevers under 101.5.

Acute back pain:

Following a blood patch, many people experience quite severe soreness in the back at the site of the blood patch. Back soreness usually peaks 3-4 days after a blood patch and then starts to ease off for most people. NSAIDS such as ibuprofen can help with this, and Tylenol can be taken at the same time as ibuprofen for this discomfort. Many patients have reported that ice is helpful for this post-patch pain, but it is not uncommon to need stronger pain medicine such as Vicodin or Percocet for several days.

Chronic back pain:

We don't know what the risk of ongoing chronic back pain is after an epidural blood patch, but it has been reported and we have seen this as well.

Epidural abscess:

We worry that if the blood that is injected gets contaminated that patients could develop an epidural abscess that could push on the spinal cord and cause permanent neurologic problems like paralysis. The absolute risk associated with an epidural blood patch is not known, but with similar epidural injections the reported risk of an epidural abscess is between 1/500 and 1/50,000. To reduce this risk we pay great attention to performing the whole procedure in a sterile fashion. Patients with any signs of any ongoing infection such as a urinary tract infection or even an upper respiratory infection should delay an epidural blood patch until their infection is fully treated. Your physician may choose to give you antibiotics before the epidural blood patch in a prophylactic manner. There is no clear proof that this is effective at reducing the already extremely low incidence of epidural abscess and the risk of the antibiotics (for example an unanticipated allergic reaction) has to be weighed against the very low risk of infection. Therefore, different physicians practice differently with regard to giving prophylactic antibiotics prior to an epidural blood patch. If you have a known allergy to antibiotics, or you are allergic to a great many medications you should point this out to the physician performing the epidural patch on the day of the epidural patch, and raise it as a possible reason not to give you antibiotics before the blood patch.

Fibrin Epidural patches:

Sometimes instead of injecting your own blood around the bag of fluid (called an epidural blood patch), we choose to patch with fibrin glue sealant (called a epidural fibrin patch). Fibrin glue is made from pooled and processed clotting factors from the blood of multiple donors. When the glue hardens it is really forming a clot. Inside the body clots do not get dry and are not hard. Inside the body a clot, and a fibrin glue seal, has the consistency of grape jelly. Your body slowly resorbs the glue much as it would a regular clot.

Advantages of fibrin glue:

The fibrin glue forms clots within seconds and some studies suggest it may work for as many as 50% of people who have already failed multiple blood patches. The clot formed by fibrin glue appears to be more durable, and stronger, and a better seal than blood. And it is our experience that it often is superior to blood in achieving the resolution of CSF leaks. When we use fibrin glue we also do not have to obtain blood by sticking a needle into a vein or an artery which makes the procedure somewhat easier for a patient.

Disadvantages of fibrin glue:

Because the fibrin glue turns into clots so fast, it needs to be injected very near where the leak is. Unlike blood which can spread several levels, the fibrin glue really doesn't spread very well because it turns into clots so fast. This means that for patients in whom imaging hasn't been very helpful in determining

the exact location of the leak, blood is often a better choice because it spreads better and can cover more ground.

Fibrin glue (tisseel or evicel) is what we call a “pooled blood product”. Since it is coming from many people's blood we worry that it could have a higher risk of transmitting a blood-borne infection. The blood supply is screened for HIV, hepatitis and known infections, but the risk of acquiring one of these infections is still not zero. However, what we really worry about most is the risk of some unknown infectious agent with a long period between infection and symptoms that could be transmitted by apparently healthy people such as Prion diseases like “Mad Cow disease” or Jacob-Creutzfeld encephalopathy. Therefore, we usually don't start using fibrin glue unless we feel the risks are outweighed by the benefits. Because it has normal blood proteins other than the ones found in your own blood you can develop an allergy to it, and rarely it can cause a severe life threatening allergy called anaphylaxis.

What if Patches fail?

If you continue to leak despite multiple blood patches and fibrin glue has not been effective, or you have some clear structural anomaly such as a bone spur that is causing your leak, then you may require surgery to help fix your leak. Because spinal fluid leaks often occur in areas where the bag of fluid (dura) has become quite thin, suturing the leak shut can be quite challenging. Sutures may tear through the tissue rather than hold it closed. Surgery, appears to fail in up to 50% of people. For these reasons and others surgery is truly a last resort for the patient with a CSF leak. Some people continue to leak either because the leak cannot be well localized and operated on, or surgery and patches cannot fix the leak.

Epidural abscess or epidural hematoma: These are rare but potentially devastating sequelae of a needle placed in the spine.

Epidural abscesses are more common in patients who are immunosuppressed, or have a coexisting infection, or have coexisting foreign objects and their epidural space such as patients with spinal cord stimulators. Patients with epidural abscesses typically have severe back pain, fevers, elevated white count, and may then developed progressive onset of numbness and/or weakness going down one or both legs and or incontinence of stool or urine. Patients with suspected epidural abscess should be treated as a neurologic emergency and sent to the emergency room for an emergent MRI, IV antibiotics, and neurosurgical consultation for potential emergent decompression.

Epidural hematomas are more common in patients with coagulation disorders, or on anticoagulants or other blood thinners. Patients with epidural hematomas may or may not have severe back pain, and may then developed progressive onset of numbness and/or weakness going down one or both legs and or incontinence of stool or urine. Typically, epidural hematomas behave differently from epidural abscesses by the absence of fever and elevated white count. However, like an epidural abscess they should be treated as a neurologic emergency. Patients with suspected epidural hematomas should be sent to the emergency room for an emergent MRI, and neurosurgical consultation for potential emergent decompression.

