

## Patient Information Sheet on Cervical Fusion Materials

Your doctor has recommended an anterior cervical discectomy and fusion. This means that through a surgical cut in the front of your neck, the front of the cervical spine will be exposed so that your surgeon can remove the disc(s) or bone spurs that are causing your symptoms. After the disc is removed, something must be placed into the disc space to restore the height relationships between the bones. Also, to promote long-lasting stability and relief of pain, it is desirable to allow your bone cells to grow across the disc space until it forms a continuous boney bridge...a fusion.

There are several options your surgeon has at his or her disposal to maintain the height and encourage fusion. Most surgeons use some type of bone block to maintain the space and allow bone cells from the neighboring vertebral bodies to slowly grow into that piece of bone. The bone used may come from another part of your body (for example, your pelvis or “hip”). This is called an autogenous bone graft, or **autograft**, for short.

Many surgeons now use prepared human bone grafts from bone and tissue banks. These bone grafts are obtained under controlled conditions and are rigorously tested. They are safe, or safer, from disease (such as bacterial and viral infection) as blood transfusions. These commercially made bone grafts from human bone are called **allografts**.

Surgeons can also use structural devices called cages to maintain the disc height. These are packed with some substance that will allow your bone cells to grow through the cage...either autograft, allograft, or even some other biologically active material.

If you will have a bone graft used as part of your cervical spine surgery, you may want to know what scientific evidence is behind your doctor’s recommendation regarding the type of bone that will be used.

The “gold standard” for bone graft has traditionally been autogenous bone graft, generally taken from the patient’s own iliac crest (“hip”) through a separate incision. Fusion rates using this bone are generally felt to be around 90% for one-level fusions. If an anterior plate-screw system is also used, several studies have shown that the fusion rate may be slightly higher, between 95% and 100%. For two level surgeries the fusion rates with autogenous (patient’s own) bone graft are from 75%-85% range without plates, and 90%-100% if plates are used.

In studies of one level anterior cervical fusions, allograft led to fusion in 73%-95% of cases without plates, and in 88% of cases with a plate. Two level cases with allograft and no plate showed disappointing fusion rates of 38%-62%, but adding anterior plates improved the fusion rate to 75%.

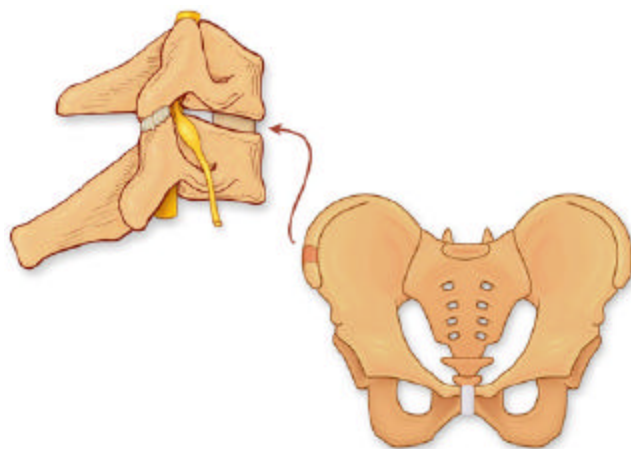
Percentages such as these merely indicate what is likely, not what will definitely happen in your case. Even if some studies report a 100% fusion rate using a certain technique, that does not mean that you are guaranteed a fusion with that same technique. Also, a solid fusion on x-ray is not the same as relief of your symptoms.

Harvesting bone from the iliac crest is not without risks. Although most patients have either no problems or slight discomfort from their bone graft donor site, some people do develop complications that may make you choose not to consider using your own bone as graft material. Everyone has additional pain from the bone graft site, and may have to stay in the hospital an extra day. It is common to have discomfort when walking, since some of the hip muscles you use for walking are detached from the iliac crest so the bone graft can be harvested. These muscles are then sewn back into place.

More significant complications resulting from iliac crest harvest are reported in various studies at between 9%-20%, including infection, hematoma (collection of blood), fracture, and sensory (feeling) nerve injury. One study reported that 2.8% of patients who had iliac crest grafts required reoperations because of these complications.

In order to avoid the problems of harvesting autogenous bone graft, many surgeons have recommended that their patients use allograft (banked bone) since there are no donor site complications, no problems with walking, no hip pain, and generally shorter hospital stays when allograft is used. If allograft had the same fusion percentages as autograft, the decision would obviously be very easy. Although allograft leads to fusion in a high percentage of cases, it does not work quite as well as the patient's own autograft bone.

Using your own bone clearly leads to a higher fusion rate, but there is the added risk of a problem related to the iliac crest donor site. Allograft avoids the problems associated with taking a bone graft from the pelvis, but the trade-off is a somewhat lower fusion rate. As we learn every day of our lives, there are pluses and minuses to most of our decisions. Success and complication rates often vary from the "average" for individual surgeons. You should talk to your surgeon about his or her experience and recommendations, and then decide together what the best surgical plan will be for you.



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