



**DES MOINES  
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Pins, Plates and Screws

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Anyone who has broken a bone that requires surgery has probably had a pin, plate or screw inserted. Depending on the type of fracture or the surgical goal, any number of hardware techniques may be utilized.

Pins, are really just smooth metal wires that have sharp tips which allows them to be placed in the body with minimal exposure and minimal tissue trauma. However, these pins have no compressive force and only serve to hold bones relatively stable. Smooth pins in the foot serve to hold fractures that are in multiple pieces together without actually compressing the fragment. Pins are also able to be placed through relative by small fracture pieces. And finally, pins are a good choice in children with open growth plates. If a broken bone involved a growth plate and has to be fixed, pins provide fracture stability with less risk of harming the undeveloped bone.



Figure. 1 Demonstrates the use of a “pin” or k-wire to hold a reduced bone or fracture. Pins don’t have threads so they generally will not compress, they will only hold a reduced fragment. This particular radiographs show the use of a pin to hold a toe that was dislocated in its proper alignment.

Screws have multiple uses in foot surgery. Screws come in various sizes and designs. Some of the screws used in surgery look remarkably similar to the screws you might use in your garage or around the house. They have a head, a shaft, and threads. While other screws are headless so they can be used in areas where the head of the screw may rub against skin. Most screws utilized today are either a form of stainless steel or titanium. Titanium although much more expensive, has some distinct advantages; it is lighter than stainless steel, less reactive and stronger.



Figure. This is an example of how screws are used to compression two bones together. This radiograph is an example of a toe fusion.



Figure. This is another example of a toe fusion. However, in this case a plate was used to hold the two bones together while they fuse. This particular plate has 5 screws.

Plate technology has advanced significantly in recent years, plates have become thinner and stronger allow for more uses in foot surgery. Historically, plates have been used to anatomically reduce and then hold a fracture. Recent advances in plate technology now allow the plate to apply some compressive forces to heal bones more anatomically.

Plates that hold and compress allow the bone to heal by primary union, which means the body does not have to produce extra bone in order to heal the fracture. A good example is a broken collar bone. Anyone who has had a broken collar bone would tell you that the bump from the fracture stayed for year. With primary bone union that bump does not exist.



Figure. The radiograph demonstrates the use of screws for compression as well as a plate for stabilization in a severe ankle fracture.

Whatever form of fixation is used, if you are going to surgery for your broken foot, it is usually for one of a couple of reasons. The fracture may be displaced (moved from its proper position), it may be unstable, it may be comminuted (multiple pieces), or it may be angulated (twisted or turned). Most fractures when aligned and stable heal well without surgical intervention. However, as technology advances so does the ability to fix fractures with smaller incisions, less dissection, and less trauma which leads to faster recovery and return to sport.

Dr. Lee Evans is a Podiatrist that practices at Des Moines Orthopaedic Surgeons. He is available to see patients at both DMOS – East and DMOS – West. To reach Dr. Evans please call 515-224-5224.es