**FRACTURE FIXATION**

1. **prepare the animal and site of the operation**
2. **prepare the theater room and the instruments**
3. **prepare the surgeon and his tem**

**1. Prepare the animal and site of the operation.**

1. General examination for the animal (body temperature, heart beat and pressure, respiratory rate).
2. Laboratory test (CBC, differential count, blood chemistry, urine analysis, stool examination).
3. Off food 24 hrs and water 6 hrs prior to the operation.
4. Prepare the site of the operation (clipping, shaving, wash with soap and tap water, and then disinfect the site of operation).

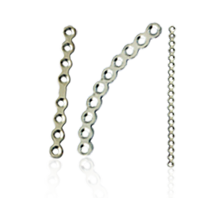
**2. Prepare the theater room and the instruments.**

1. Prepare the operation room (clean, sterile the room, checking lights, water supply, ventilation).
2. Prepare the instruments (prepare and sterile the stander and special set, prepare the drapes).
3. Prepare all equipments which essential for operation (anesthetic agents, oxygen, heart stimulant sutures materials, antibiotics, fluid therapy, fixation devices-ray films).

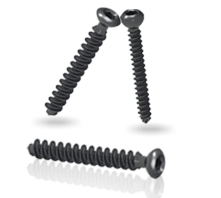
**3. Prepare the surgeon and his team.**

1. Must be in good condition.
2. Knowledge Refreshment about the technique and anatomy prior the operation.
3. Change the street clothes with the operation clothes.
4. Wear the mask and cup
5. Prepare and disinfect the hands
6. Wear the sterile apron
7. Wear the surgical gloves

Veterinary Implants and Instruments

[](http://www.veterinaryimplants.com/bone-plates.html)

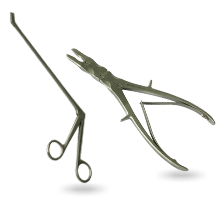
[Bone Plates](http://www.veterinaryimplants.com/bone-plates.html)

[](http://www.veterinaryimplants.com/bone-screws.html)

[Bone Screws](http://www.veterinaryimplants.com/bone-screws.html)

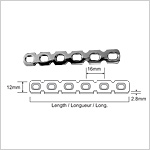
[](http://www.veterinaryimplants.com/pins-wires-&-staples.html)

[Pins, Wires & Staples](http://www.veterinaryimplants.com/pins-wires-&-staples.html)

[](http://www.veterinaryimplants.com/general-instruments.html)

[General Instrume](http://www.veterinaryimplants.com/general-instruments.html)

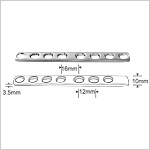
### New Products

[](http://www.veterinaryimplants.com/634VET/reconstruction-plate-4-5mm-screws.html)

[Reconstruction Plate 4.5mm Screws](http://www.veterinaryimplants.com/634VET/reconstruction-plate-4-5mm-screws.html)

Model No: 634VET

[View Detail](http://www.veterinaryimplants.com/634VET/reconstruction-plate-4-5mm-screws.html)

[](http://www.veterinaryimplants.com/617VET/dynamic-self-compression-plate-for-small-fragment-for-ulna-and-radius.html)

[Dynamic Self Compression Plate for Small Fragment for Ulna and Radius](http://www.veterinaryimplants.com/617VET/dynamic-self-compression-plate-for-small-fragment-for-ulna-and-radius.html)

Model No: 617VET

[View Detail](http://www.veterinaryimplants.com/617VET/dynamic-self-compression-plate-for-small-fragment-for-ulna-and-radius.html)

[](http://www.veterinaryimplants.com/PS901VET/pin-steinmann.html)

[Pin Steinmann](http://www.veterinaryimplants.com/PS901VET/pin-steinmann.html)

Model No: PS901VET

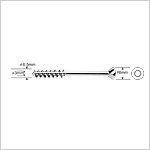
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[](http://www.veterinaryimplants.com/IPW927VET/steinmann-pin-introducer-s-s-with-s-s-chuck-key.html)

[Steinmann pin introducer S.S. with S.S. Chuck & Key](http://www.veterinaryimplants.com/IPW927VET/steinmann-pin-introducer-s-s-with-s-s-chuck-key.html)

Model No: IPW927VET

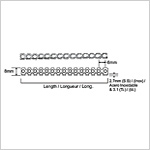
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[](http://www.veterinaryimplants.com/721VET/cancellous-screw-6-5mm.html)

[Cancellous Screw 6.5mm](http://www.veterinaryimplants.com/721VET/cancellous-screw-6-5mm.html)

Model No: 721VET

[View Detail](http://www.veterinaryimplants.com/721VET/cancellous-screw-6-5mm.html)

[](http://www.veterinaryimplants.com/632VET/reconstruction-plate-2-7mm-screws.html)

[Reconstruction Plate 2.7mm Screws](http://www.veterinaryimplants.com/632VET/reconstruction-plate-2-7mm-screws.html)

Model No: 632VET

[View Detail](http://www.veterinaryimplants.com/632VET/reconstruction-plate-2-7mm-screws.html)

Fractures fixation devices

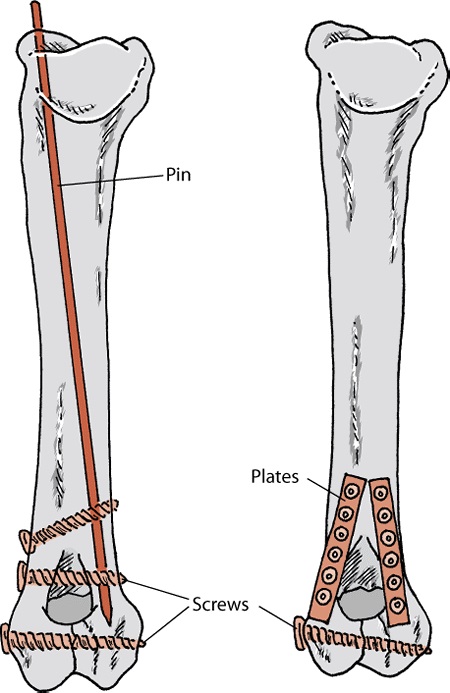
|  |  |
| --- | --- |
| Internal fixation devices | External fixation devices |
| * Intramedullary pins | * Cooptation splints |
| * Compression bone plate with screw | * Mason meta |
| * Screw | * Plaster of Paris |
| * Wire circulate | * Air cast (Gypsona). |
|  | * Modified Thomas splint |
|  | * Half pin splintage (kirshner splint). |
|  |  |

Advantages and disadvantages of fracture fixation devices.

1. **Intramedullary pins.**

|  |  |
| --- | --- |
| Different types,rush,kuenscher,and Steinman |  |
| Using in different type of fractures |  |
| Need highly aseptic technique |  |
| Can be used as retrograde methods or normograde methods |  |
| Used in open reduction |  |

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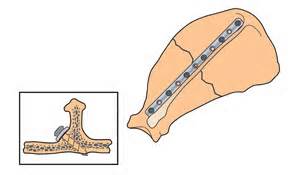
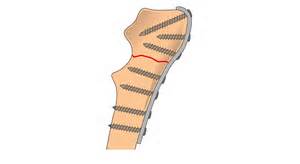
1. **Compression bone plate with screw.**

|  |  |
| --- | --- |
| Lead to rigid fixation | Expensive |
| Direct or primary fracture healing | Need more device for fixation |
| highly aseptic technique | May lead to infection |
| No or little callus formation |  |



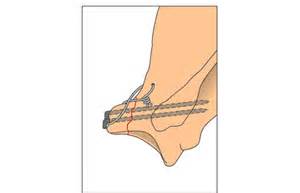
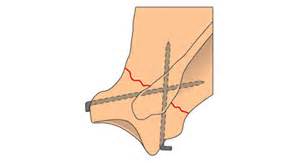
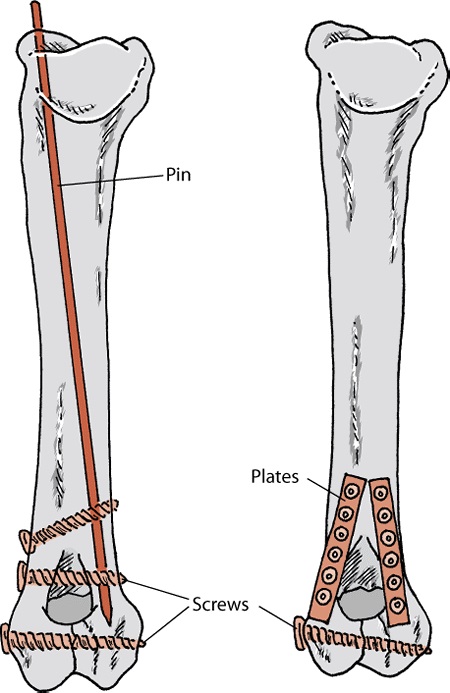


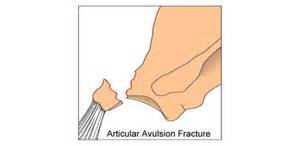
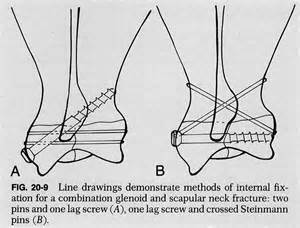


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1. **Screw (Lag screws fixation).**

|  |  |
| --- | --- |
| Used in oblique fracture alone |  |
| Can be used with bone plate |  |
| Can be used with stainless wire |  |
|  |  |

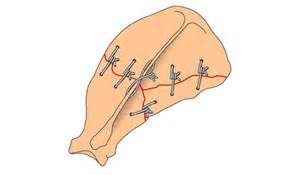
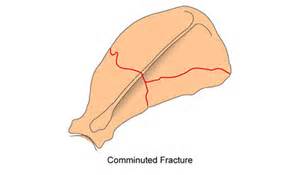


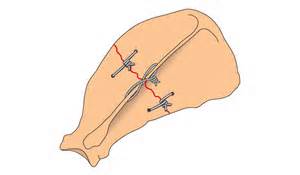
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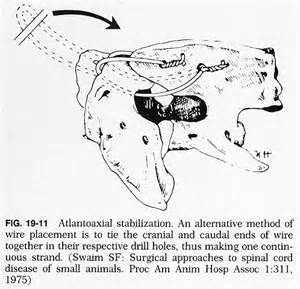
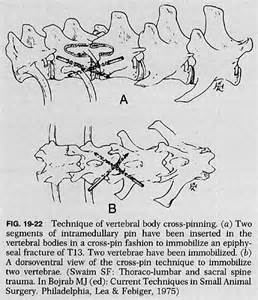
1. **Wire circulates.**

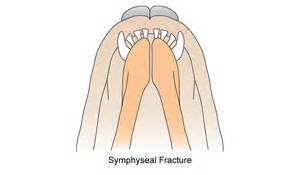
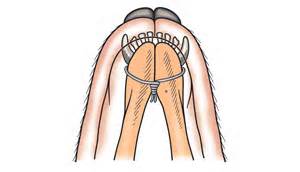
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1. **Cooptation splints.**

|  |  |
| --- | --- |
| **Wood,almnoum plates,alumafoam** | **Reexamine the splints 24 hrs later** |
| **Using plaster with the splints** | **Checking for pressure necrosis, or loosen tight** |
| **Easy to use** | **Must remain dry** |
| **Active in some types of long bone fractures: simple ,transvers in radius,ulna,tibia ,and fibula** | **Weekly reexamine the pressure of the splints to avoid its bad affect on the blood circulation** |
| **Use it in the fracture of distal end of ,scapula,ribs,and tail** |  |
| **Light weight,strong.small in size** |  |
| **The above and below joint involved** |  |
| **The bone fragment remain in good alignment during fixation** |  |
| **Must not affect on the blood circulation** |  |
| **Can use tongue depressor** |  |
| **Can use pad of cotton** |  |

1. **Mason Meta.**

|  |  |
| --- | --- |
| Cast of alumnoum |  |
| In metacarpus and metatarsus bones and bones far to these . |  |
| In the caudal aspect of the fracture limb |  |
| Using pad of cotton in side |  |
| Adhesive tape |  |
| Can be agustable to fit different size and length of bones |  |
|  |  |
|  |  |
|  |  |

1. **Plaster of paris (Gypsona).**

|  |  |
| --- | --- |
| Hard and dry quickly | May lead to abrasion wound |
| Not heavy weight and strong | May case pressure necrosis |
| Can be used in two three layer |  |
| Don’t need to clipping hair |  |
| Using without pad |  |
| Easy to remove by saw |  |
| Check the splints 24 hrs ago |  |
| best for transverse or epiphyseal fractures, especially in younger animals. |  |
| Cast must extend from the foot to include a joint above the fracture site. |  |



[](http://images.search.yahoo.com/images/view;_ylt=AwrB8pYxlZtVTQwACcQ2nIlQ;_ylu=X3oDMTIyY3NxcXZmBHNlYwNzcgRzbGsDaW1nBG9pZAM5NDNiMTYwYjBkMzRlZWRkMWI1MWQzYzc5MjY2MmZmZgRncG9zAzQEaXQDYmluZw--?.origin=&back=http://images.search.yahoo.com/yhs/search?p=Fractures+Fixation+of+Small+Animals&fr=yhs-avg-fh_lsonswrow&hsimp=yhs-fh_lsonswrow&hspart=avg&tab=organic&ri=4&w=1024&h=660&imgurl=booksite.elsevier.com/smallanimalfracturemanagement4eapp/images/radius_diaphysis_transversefx01_33-44a.jpg&rurl=http://booksite.elsevier.com/smallanimalfracturemanagement4eapp/&size=29.5KB&name=radius/ulna&p=Fractures+Fixation+of+Small+Animals&oid=943b160b0d34eedd1b51d3c792662fff&fr2=&fr=yhs-avg-fh_lsonswrow&tt=radius/ulna&b=0&ni=128&no=4&ts=&tab=organic&sigr=12062crff&sigb=14qj6gt6u&sigi=13a07313l&sigt=10btmif98&sign=10btmif98&.crumb=r5gJh9LyLu/&fr=yhs-avg-fh_lsonswrow&hsimp=yhs-fh_lsonswrow&hspart=avg)

1. **Aircast**

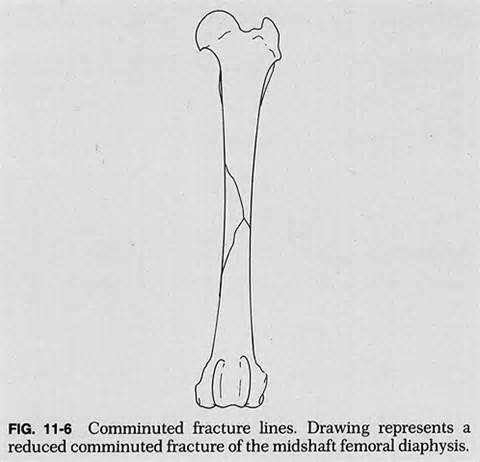
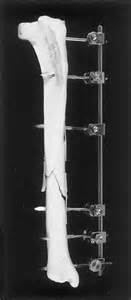
|  |  |
| --- | --- |
| Plstic material |  |
| Need catalyst reagent to use and to remove |  |
| Water resistant |  |
| Allow air to reach the skin |  |
|  |  |
|  |  |
|  |  |
|  |  |

1. **Modified Thomas splints.**

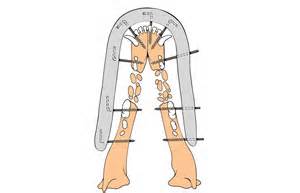
|  |  |
| --- | --- |
| Made of deuraluminum | Aluminum is not useful because easy to broken when bending |
| Can made of Different size and length,4/3,1/4,and4/8 inches diameter ,and 6and 2 foot long |  |
| Can use adhesive tape or bandage around the rode |  |
| Can use kirshner wir,Steinman pin for more fixation |  |

1. **Half pins splintage (kirshner splint)**

|  |  |
| --- | --- |
| Half pin in the bone and the other half outside the skin | Need special apparatus to connection and control |
| Easy to control the bone from outside | Infection can occures |
| Using in one side of the leg | Need highly aseptic technique |
| Joints freely movable | Seepage of pins may occurs |
| Not affect on the blood circulation or muscular atrophy |  |
| Modified to half kirshner |  |



[](http://images.search.yahoo.com/images/view;_ylt=AwrB8o9SlZtVQxQA3Ek2nIlQ;_ylu=X3oDMTIzanAwZzI2BHNlYwNzcgRzbGsDaW1nBG9pZANjY2VjZWEyNTRiZjQyMjRiNzA0MTQzZGViMDBiMWI3NwRncG9zAzkwBGl0A2Jpbmc-?.origin=&back=http://images.search.yahoo.com/yhs/search?p=Fractures+Fixation+of+Small+Animals&fr=yhs-avg-fh_lsonswrow&hsimp=yhs-fh_lsonswrow&hspart=avg&nost=1&tab=organic&ri=90&w=296&h=305&imgurl=www.vetsurgerycentral.com/images/orthopedics/fracture_esf/esf.jpg&rurl=http://www.vetsurgerycentral.com/esf.htm&size=14.5KB&name=Special+care+of+the+fixator+and+pin+tracts+are+necessary+to+prevent+...&p=Fractures+Fixation+of+Small+Animals&oid=ccecea254bf4224b704143deb00b1b77&fr2=&fr=yhs-avg-fh_lsonswrow&tt=Special+care+of+the+fixator+and+pin+tracts+are+necessary+to+prevent+...&b=61&ni=128&no=90&ts=&tab=organic&sigr=118g93ikj&sigb=152h4c6n6&sigi=121kv2bvv&sigt=127q27l5i&sign=127q27l5i&.crumb=r5gJh9LyLu/&fr=yhs-avg-fh_lsonswrow&hsimp=yhs-fh_lsonswrow&hspart=avg)



[](http://images.search.yahoo.com/images/view;_ylt=AwrB8o9SlZtVQxQA20k2nIlQ;_ylu=X3oDMTIzdWF1MnEwBHNlYwNzcgRzbGsDaW1nBG9pZAMyNDgyNWJjMDdjNTA4ZTZlYzMxYTZlZjhjOWZiNDdmYwRncG9zAzg5BGl0A2Jpbmc-?.origin=&back=http://images.search.yahoo.com/yhs/search?p=Fractures+Fixation+of+Small+Animals&fr=yhs-avg-fh_lsonswrow&hsimp=yhs-fh_lsonswrow&hspart=avg&nost=1&tab=organic&ri=89&w=1024&h=660&imgurl=booksite.elsevier.com/smallanimalfracturemanagement4eapp/images/radius_diaphysis_transversefx03_33-48-4.jpg&rurl=http://booksite.elsevier.com/smallanimalfracturemanagement4eapp/&size=29.2KB&name=radius/ulna&p=Fractures+Fixation+of+Small+Animals&oid=24825bc07c508e6ec31a6ef8c9fb47fc&fr2=&fr=yhs-avg-fh_lsonswrow&tt=radius/ulna&b=61&ni=128&no=89&ts=&tab=organic&sigr=12062crff&sigb=152kgmluh&sigi=13baf7ql5&sigt=10btmif98&sign=10btmif98&.crumb=r5gJh9LyLu/&fr=yhs-avg-fh_lsonswrow&hsimp=yhs-fh_lsonswrow&hspart=avg)



**Fracture Surgery**

**Bone fracture repair**

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Introduction to the surgical repair of broken bones in dogs and cats

