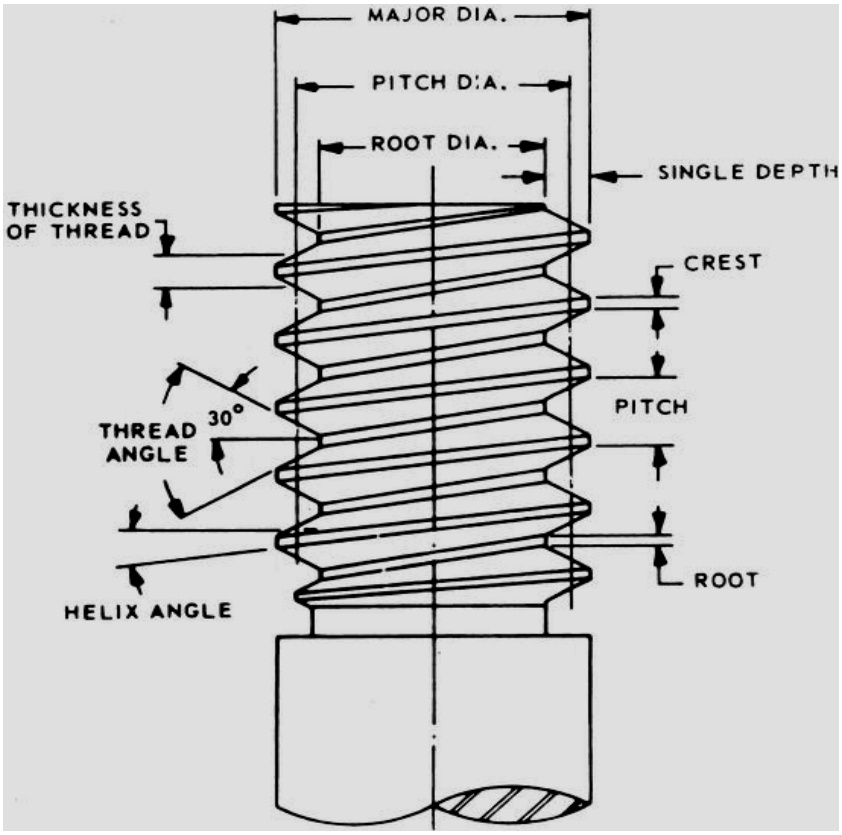
Screw

Definition: Rotational movement is converted into linear compression



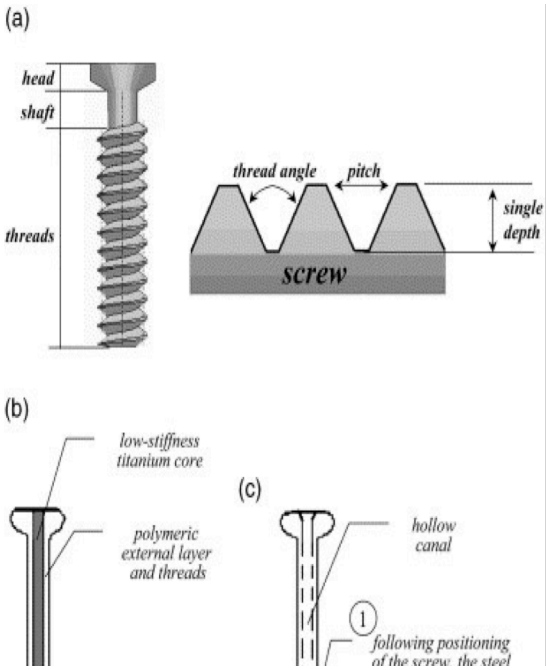
Pre drilled hole: glide hole,
pilot hole

Thread :	**Cortical**	**Cancellous**
Pitch	**closer**	**wider**
Pitch diameter	4.5mm [Tap3.2]	6.5mm [Tap 4mm]
	3.5 mm [2.7 mm]	4 mm [2.7]
Threaded portion	Fully threaded	half or fully threaded
Tips	Rounded	Cutting
	Needs tap	Does not need
Used for	Cortical Bone	Cancellous bone

Screw head Locking Nonlocking screws

Threads over the head present Nonpresent

Internal Fixator



Components

core diameter

thread diameter

thread depth – increased in cancellous screws

– increased resistance to pull out.

Pitch: Distance between threads

Cannulated or Non-cannulated:

Useful in percutaneous fixation

Tip

self tapping - cancellous screws - cuts own thread

trocar tipped - malleollar screws - self drilling

Rounded: Nonself tapping cortical screws

Lag Screws

Compression of 2 bony surfaces

Term: Near cortex and Far cortex

Should be passed middle of the fragment

Lag Principle

Lag screw -1. Cancellous partially threaded screw - shaft diameter equal to the core diameter.

2. Cortical screw with Glide hole and thread hole

Lagging priniciple with fully threaded cortical screw.

Glide hole - equal to the thread diameter.

Threaded hole - equal to core diameter

Site of fracture

Metaphyseal fracture: just screw is adequate

Diaphyseal fracture: When screw alone:

Should be long spiral with length of fracture more than twice the diameter

Minimum 3 screws

The central screw: perpendicular to the bone. More stability to axial load

Two outer screws: should be perpendicular to the fracture: best for shear load

Spacing between the screws more important

However most long bones: need neutralization by the plate as screws alone is not sufficient to withstand the load

If fracture is less oblique [>60°] not suitable for IFS

Two technique of drilling guide hole:

I Glide hole [3.5 mm]; then use Mush room and drill 2.5 mm

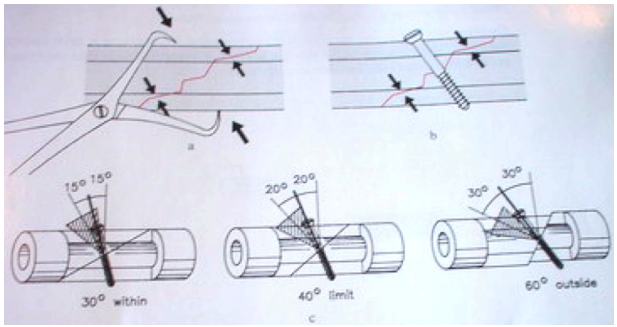
2. First 2.5 mm and then 3.5 mm for the proximal hole

Inter-fragment screw fixation: IFS

1. Lag screw: Cortical or cancellous
2. Inserted in the center of the fragment

   Right angle to the fracture
3. Self-tapping is better.
4. To Neutralize or not:

   Long bones: always neutralize with a plate.



Tapping

Less torque lost in overcoming friction at the bone-screw interface.

Less force required.

Less likelihood of losing fracture position.

Newer self-Tapping Screws are quicker, less instruments, tight fit, same holding power as pre-tapped screw.

Always use tap for IFS

Concept of Non-self taping: Taps are sharper than screws and has better clearing system and no clogging

Drills

Twisting drill

1. Chisel edge: At the apex of the drill is the chisel edge, where the two cutting edges meet
2. Flank: surface not in contact with cutting
3. Flute: which comes in contact and cuts
4. Drill rotates, cutting part of the flute cuts the bone and debris are passed through noncutting part of the flute preventing clogging
5. Optimal point angle is 90 degrees