

## Technical Aspects of “DUROPLAST” Plaster of Paris Bandage B.P.:-

### a) **Saturation of the Bandage:-**

Plaster of Paris Bandages are applied by first dipping into water at an angle of 45°. As the water comes in contact with the bandage, bubbles begin to appear. These bubbles continue till the entire bandage is soaked completely in water. This time normally takes just 3 to 5 seconds. This wetting of the bandage is known as water absorption or saturation of the bandage.

### b) **Setting Process:-**

After soaking of the bandage it is applied on the part of the body as determined by the orthopaedic surgeon. As the bandage is applied, it simultaneously begins to ‘set’. By setting it means that the cast begins to harden and stiffen. Long thin crystals form rapidly and interlock closely – and it is this interlocking which gives the plaster most of its ultimate strength. As the cast sets, there is excessive water left which evaporates over a period of time. This evaporation leaves certain air voids or gaps in the crystal formation of the cast. These voids make the cast porous and permit the air to reach the skin through the cast.

Thin casts may dry completely in a few hours but the thick ones may require a longer time period. The rate at which this evaporation takes place depends upon the humidity, ambient temperature, circulation of air around the cast. The cast may appear dry on the surface but may be yet containing considerable water in the deeper layers.

### c) **Setting Time:-**

Setting time is the time which the plaster cast takes to become sufficiently hard, so as to prevent a needle from entering it when dropped on the cast. The setting time is measured from the point at which the plaster is wetted to the point at which the cast becomes firm. A setting time of 4 to 6 minutes means that the cast will become hard enough to provide immobilization within 4 to 6 minutes from the time the Plaster of Paris bandage is dipped in water.

### d) **Dry and Wet powder Loss:-**

When the bandage is put in the final packing and transferred from one place to another the particles of the dry Plaster of Paris powder which are impregnated on the gauze fall off from it and collect in the pouch. This falling off of the powder is known as dry powder loss. This is a loss because this Plaster of Paris powder cannot be used when the bandage is applied and hence be of no use in adding strength to the cast.

Wet powder loss takes place after the bandage is immersed in water just before application, and taken out and slightly squeezed to expel excess water, a small amount of wet powder falls off the bandage and is of no use.

### e) **Cast Strength:-**

Simply put, the cast strength is the force required to break the cast. The final strength of the cast is obtained nearly after 72 hours from the time it is applied. The strength of the cast increases as the water evaporates. Hence excessive wetting is never advised because this will weaken the cast and it will take too long to dry out along with higher wet powder loss. While applying the bandage a moderate rubbing / lamination of each successive layers will help to form a solid well-fused cast.