

## Appendix

Excerpts from de Chauliac's "Fifth Treatise on Fractures and Dislocations" are remarkably similar to modern principles, with the general treatment of fractures following four principal intentions:

...the first is to equalize the bone; the second to preserve the equalized bone; the third to bind it with callus; the fourth to remedy complications.

But before proceeding to show how these said intentions will be accomplished, we first set down six teachings, which are necessary to the operations, as mentioned previously.

The *first teaching* is that before all things one should prepare all that is necessary for the reduction. First, a suitable place. Secondly, suitable assistants. Thirdly, white of eggs in good quantity and red oil and a bandage steeped in it, which may be in size according to the injured organ. Fourthly, thread and three bandages, wide and long according to the member, with one or two arm braces dipped in oxycrat [water and vinegar] and wrung out. Fifthly, light compresses well linted and equally made according to the size of the limb, moistened similarly in oxycrat and expressed as Rhazes counsels. [Rhazes, Muhammad ibn Zakariya Razi, 865 to 925, was a Persian physician, philosopher, and scholar said to have been the greatest clinician of his time.] Sixthly, splints, light and smooth, made of willow or of sword handle wood or of horn or of iron or leather, and in length according to the limb, and which pass three or four finger widths beyond the fracture, as Albucasis says, and more if it is necessary, provided alone that they neither touch or injure the joint; larger in the middle than in the extremities, in such number as will be necessary to surround all the limb; and so that from one to the other there may be the width of a finger. Let one cover them with cloth and let them be moistened with egg white. Seventhly, if it is necessary let one have some cannula tied with a cord, each separately so much as there will be need, according to the length of the limb, and let the splints be bound with the cord so that by twisting the cannula they may be sufficiently tightened; then a little rod is passed through the cannula in order that they do not lose their revolution and tightness. Eighthly, let one have a cradle or suspensory in which the limb will be firmly and evenly placed. Ninthly, a mattress bed on which the patient sleeps, and if it is necessary let it be perforated so that he may go to stool. Tenthly, a cord hanging over the bed, or some other thing for him to catch and help himself when he wishes to go to stool to straighten or turn himself.

The *second teaching* is regarding the equalizations and requires that at the time of the equalization there should be two assistants and that one *holds and pulls* the limb from one end and the second from the other end directly in order that the projections be broken...

The *third teaching* is that the conservation which will be made by ligature and by situation may be easy and not painful. ...I have seen many limbs suppured and corrupted...because the bandage which is loose does not hold the bones and that which is too tight causes pain and does not permit the life blood to reach the limb. ...the natural

and customary shape of the part is mostly without pain, and the patient must be constantly warned that he so keep the limb. To this end are invented the cradles and suspensories and mechanical instruments to hold the limb more firmly and surely.

The *fourth teaching* is that from the beginning one applies light splints or something in place of them, not to restrain, but only to sustain up to the seventh day until the time of aposthemation may be passed. After that let good and sufficient splints be placed to restrain and sustain and let them be continued to the end until the callus is quite firm; and (as Avicenna says), do not be in any hurry to remove them...

The *fifth teaching concerns* the time of removal: that the removal be not made unless it appears that the fracture is well restored and that nothing sinister has appeared...

The *sixth teaching* treats of the generation of callus or porus that after it commences to engender, toward the sixth day, the diet ought be enriched. Because, says Galen, it is necessary to renourish the body with good juicy and nourishing foods...