Bony Prominence Wedge Affect™

Laboratory studies have documented forces created at the bony-soft tissue interface are greater in intensity than the causative forces delivered at the soft tissue-support surface interface. Laboratory studies have also shown that the type of supporting media dictates what type of compression or shear (distortion) strain develops in the soft tissue at risk when a human body is placed on a support surface.

The basic principles of physics, chemistry, and mechanics define why this predictable stress to strain reaction occurs. These principles are the kinetic molecular theory, the ideal gas law, Archimedes principle, the physical properties relating to a static fluid, dynamic fluid, and solid media, and the mechanical advantage of the simple inclined plane machine as relating to a wedge-shaped structure. Utilizing these basic scientific principles, one can explain the clinical presentation of ischemic necrosis (PresShear Sore™) occurring secondary to placing a human body on an improper surface.

Maintaining volumetric three-dimensional configuration of the soft tissue at risk can be accomplished by delivering non-gradient perpendicular pressure by floating the body in a static fluid media. Flotation therapy is the most effective therapy to prevent and treat PresShear Sore™ problems. The benefit of maintaining volumetric support by utilizing flotation therapy is that the bony prominence is not allowed to sink into the surrounding soft tissue. If this unwanted impaling occurs, then vertical shearing occurs with subsequent tissue distortion, ischemia, tissue injury and ultimate cellular necrosis. This sequential event explains the crater-like wounds occurring around, not only under, the bony prominence. Thus, the impaling of the wedge-like bony prominence into the surrounding soft tissue creates force amplification following the mechanical advantage of a wedge inclined plane machine.

This mechanical advantage is better understood when one compares a high heel shoe versus a flat heel shoe. The pressure under the high heel shoe is greater than that of the flat heel shoe based on the smaller area of support contact. But the force of the high heel shoe is magnified when the high heel impales into a viscoelastic material (i.e. asphalt). Upon impaling of the wedge-like structure, the smaller surface of contact becomes a surface into which a wedge is being driven with the force amplification of the weight of the body. This above explanation is comparable to the unwanted occurrence when a bony prominence impales into the surrounding viscoelastic soft tissue when shear strain (distortion), not volumetric support (equalized compression), is delivered to the body by a support surface. This is why a static fluid system is the ideal media to float the body.