## F15 Three Methods of Measuring the Force of the Human Bite

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The goal of this presentation is to present simple methods of measuring and verifying the force of the human bite.

Getting accurate bite force determinations will impact the forensic science community by aiding in understanding bite mark injury patterns and the dynamics of the jaws in clinical dentistry.

Three methods are presented. The first utilizes a simple weight scale. The second uses pneumatics. The third involves suspending a weight on the subject's mandible.

One apparatus is the simple scale which utilizes Hooke's law, where the extension of the spring inside the scale is directly proportional to the weight it is measuring. The device allows for an adjustment to allow it to be placed in the mouth so that a measurement can be made which is directly read off the scale.

The pneumatic apparatus use a regulated air pressure inside an air cylinder, in which an attachment that fits comfortably in the mouth is attached to the piston. The air pressure is adjusted upward until a point is reached where the subject cannot move to close the piston. The area of the piston is known and so is the pressure. Force equals pressure divided by area, therefore force can be calculated.

The third method consists of suspending a known weight from a device which rests comfortably on the subject's mandible. The subject can start out with very light weights, and either attempt to make closure of the jaws or close the jaws with the device in place and attempt to lift the weight from a slack position.

Anecdotally the human bite force has been reported any where from a 100 to 150 pounds. The above provides some simple methods for determination and verification.

By having simple and verifiable determinations of human bite force, the understanding of the causes of human bite mark injury patterns will be better understood. In addition the dynamics of mastication and occlusion in clinical dentistry will be better understood.

**Hooke's, Pneumatic, Bite Mark**

 ** Presenting Author*