Invention Disclosure: Inflatable Airway Support Neck Collar

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Description: Three chamber(bladder) inflatable airway support neck collar with optional bladder pressure display and acoustic monitoring system.

Figure 1: Basic three-bladder inflatable neck support. From http://www.dealextreme.com /p/cervical-vertebrae-retractor-neck-fixer-7175)

Intended Usage: This investigational product is Intended to help prevent airway obstruction in high-risk spontaneously breathing individuals in the supine position. An example of a high risk-population where it is hoped that this device will benefit are obese men with obstructive sleep apnea receiving IV opiate therapy (e.g., PCA morphine) following painful knee replacement surgery.

Mechanism of Action: Our untested hypothesis is that the device works via a "jaw-thrust" form of mandibular advancement, as illustrated schematically in

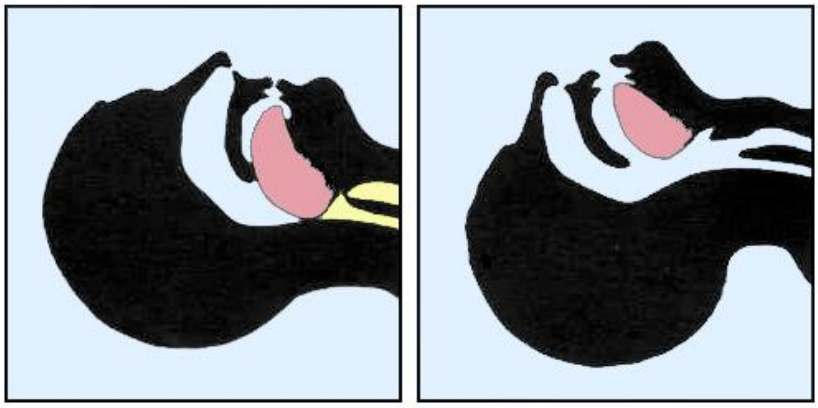

Figure 2: Hypothetical illustration of the airway before (left) and after (right) use of the system, showing an improved airway from maintaining the tongue and mandible in a more favorable position.

Design Notes: This is a three chamber inflatable neck support device intended primarily to help maintain an open airway by keeping the mandible in a more "anterior" position, such as often done with the well-known "jaw thrust" maneuver. Inflation lines for the three chambers converge to a single inflation line pressurized via a simple hand pump (Figure 1). This inflation line can additionally be instrumented in two ways. First, the cuff pressure can be displayed using a gauge from an ordinary blood pressure kit or even electronically, possibly for real-time monitoring of pressure variations that might signal (for example) that the patient is struggling to breath. Second, any acoustic emissions captured by the internal air bladders is recorded using an optional special leak-free microphone that tolerates high-bias pressures. Both these options are connected to the main inflation line via a manifold such as that shown in Figure 3.

Figure 3: Manifold allowing for connection of [1] pressure gauge, [2] special leak-free acoustic emissions transducer, [3] hand-operated inflation pump and [4] inflatable bladder system. From http://www.s4jluer.com /MF6401webg.gif