*Title:* ***BUILD YOURSELF A LOW COST PNEUMATIC PRESSURE BAG INFLATING DEVICE***
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***Manually pumping the bulb of a commercially available pressure infuser to 300-400 mmHg is a commonly used method to rapidly administer IV fluids and blood. With fluid administration to the patient and gradual emptying of the IV fluid bag, the pressure in the pressure infuser decreases requiring manual re-inflation to maintain the desired pressure to ensure constant flow of fluids to the patient. This is slow, cumbersome and ties the hand of the anesthesiologist.***

***We describe here a simple, self assembled and inexpensive ($284) device composed of manually adjustable pressure regulator and shutoff valves connected to an oxygen "E" cylinder (or to any wall O2 outlet by changing part #1) that can automatically inflate and maintain a constant pressure in the infuser. Figure 1 shows the schematic arrangement of the device. The tubing of the pressure bags is connected to part #9. Table 1 lists the different parts used to assemble the device and Table 2 lists the manufacturers the parts described.***

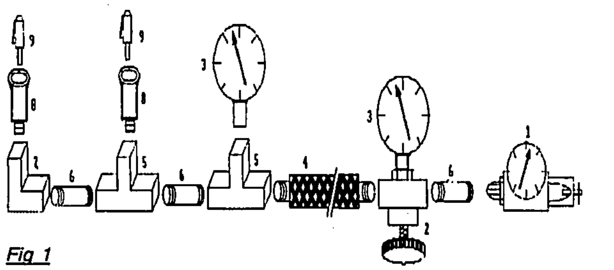

*Fig 1*

***We have used the device in the operating room and found it to be reliable and easy to use.***

**Table 1: Parts list**

| No. | Description | Cat # | Quant. | Price |
|---|---|---|---|---|
| 1. | Single stage preset O2 regulator (50 PSI) | MR-870-P | 1 | 65.00 |
| 2. | Miniature regulator 0-15 PSI, 1/4" NPT | GH15XTHEXXXB | 1 | 45.15 |
| 3. | 0-15 PSI gauge, 1/4" NPT | G6077689 | 2 | 10.90 |
| 4. | Conductive oxygen hose NPT 1/4" Male both sides | 111006161 | 1 | 20.76 |
| 5. | Female Tee 1/4" NPT 3 way | MA-19 | 3 | 4.00 |
| 6. | Long nipple 1/4" NPT x 1 1/2" long | MA-29 | 2 | 4.94 |
| 7. | Elbow 1/4" x 1/4" NPT female | MA-12 | 1 | 3.28 |
| 8. | MPT Shutoff body only 1/4" stainless steel | 5327K84 | 2 | 33.46 |
| 9. | Insert for a single end shutoff system NPT 1/4" tube | 5327K13 | 2 | 17.22 |

**Table 2: Manufacturers of the corresponding parts**

| Parts 8,9 | Parts 1,4,5,6,7 |
|---|---|
| McCaster-Carr | Western Enterprises |
| P.O. Box 317 | 33672 Pin Oak Parkway |
| Dayton, NJ 08810 | Avon Lake, Ohio 44102 |
| (312)833-0300 | (216)933-2171 |
| (201)329-3200 | (216)871-2160 |

Parts 2,3
Conoflow - ITT Grinell Valve Inc.
P.O. Box 768
St. George, SC 29477-0768
(803)563-9281

## A519

TITLE: EVALUATION OF RIGHT VENTRICULAR EJECTION FRACTION CATHETERS USING A RIGHT VENTRICULAR PULSATILE FLOW BENCH MODEL

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Measurement of right ventricular ejection fraction (REF) using thermodilution requires a rapid response thermistor and complete mixing of the injectate. The new Edwards REF catheter utilizes a fast response thermistor and a multihole injection port for measurement of REF. Previously, REF using this catheter was correlated to nuclear or echocardiographic REFs. These techniques, however, are variable, so the present study evaluates the Edwards REF catheter against reference REFs obtained from a right ventricular (RV) pulsatile flow bench model.

The RV bench model consisted of a Thoratec Ventricular Assist Device (VAD), a reservoir,low compliance tubing, heat exchanger, a REF catheter for injection, and a REF catheter and REF-1 computer. The injectate port and thermistor were positioned 3cm from the inflow and outflow ports of the VAD, respectively. Circuit temperature was maintained at 36-37 C, and the injectate at 2-3 C. A stimulus generator triggered the VAD and the REF-1. The RV bench model was set to 60 beat/min and 30% systole for all REF measurements. The REF catheters were evaluated at 15, 20,30,40, and 50% ejection fractions. Five volumetric measurements were made prior to and following catheter evaluations. Five REF catheters were evaluated at each setting averaging 5 trials for each catheter.Pre and post volumetric calibration measurements showed no significant variability. Although catheters reliably distinguished between the different REFs tested, statistically significant intercatheter variability was observed. Three of the catheters consistently estimated ejection fractions, higher than the remaining 2 catheters. Additionally, the variability in catheter response at the various EFs was not consistent. Average catheter bias caused a statistically significant overestimation at all EFs except at the 30% level. Average bias was greatest at 40% EF being 8 EF% points above the actual value, and lowest at 30% EF, being 0.3 EF% points above the actual value. Individual catheter biases ranged between -2 and 11 EF% points of the actual EF.

The present study establishes a reasonably good correlation between REF catheter values and actual ejection fractions obtained from the bench model between 15 and 30% EF. Between these levels, REF estimates of the ejection fraction are, on the average, expected to be no more than 2 EF% points greater than the actual ejection fraction. At ejection fractions above 30%, accuracy was reduced and ejection fraction was overestimated by as much as 8 EF% points. Although there was significant intercatheter variability, it was small and didnot appear to significantly affect the catheters ability to discriminate between the ejection fractions tested.

| Reference EF% | EF%±SEM | Bias EF% |
|---|---|---|
| 14.3 | 17.0±0.7 | 2.6* |
| 19.8 | 22.0±1.1 | 2.2* |
| 29.9 | 30.2±1.0 | 0.3 |
| 41.3 | 49.4±0.7 | 8.0* |
| 50.9 | 54.4±0.7 | 3.5* |

* indicates significantly greater than zero $p<0.05$