

Novel Use of Catheter Mount as an Alternative to T-piece

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ABSTRACT

Catheter mounts with swivel connectors are used to attach the endotracheal tube to the ventilator circuit, dampening jerks and drags and increasing patient comfort. We suggest a unique application of catheter mount as T-piece for weaning, eliminating the need for a single inventory purchase and repurposing a previously used item for a new use, lowering the financial burden on patients. In our ICU, catheter mounts are being used as an alternative to T-piece for 30-minute weaning trials following successful SBT trials to evaluate patients' response to Zero PEEP (ZEEP) and therefore the probable occurrence of alveolar derecruitment to decrease extubation failure.

Keywords: Catheter mount, Spontaneous breathing trial, T-piece, Weaning from mechanical ventilation.

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The T-piece spontaneous breathing trial (SBT) is still used in mechanical ventilation weaning as a rigorous assessment technique for determining readiness to extubate.¹ The T-piece used in intensive care units (ICUs) is a modified form of Ayre's T-piece, which offers a low-resistance open circuit with corrugated reservoir tubing and fresh gas supply at diagonally opposite ends, with the patient connection perpendicular to both.² Weaning on T-piece produces near-normal stress for any patient since it lacks positive end expiratory pressure (PEEP) and pressure support and so increases the work of breathing as compared to weaning on pressure support ventilation (PSV). T-piece, being a more strenuous exercise, increases the rate of weaning trial failure and hence delays extubation; nevertheless, weaning on PSV has a higher incidence of extubation failure.³ Reintubation, in and of itself, increases morbidity and mortality.⁴

Catheter mounts with swivel connectors are used to attach the endotracheal tube to the ventilator circuit, dampening jerks and drags and increasing the patient comfort. We propose a novel usage of a catheter mount as a T-piece for weaning, which removes the need to purchase the original T-piece as inventory by reusing a previously used item for a new function, hence reducing the cost burden on patients. In our ICU, catheter mounts are being used as an alternative to T-piece for 30 minute weaning trials following successful SBTs to evaluate patients' response to zero PEEP zero end expiratory pressure (ZEEP) and therefore the probable occurrence of alveolar derecruitment to decrease extubation failure.

After removing the cap, the flowmeter's oxygen flow is connected to the catheter mount's suction port as shown in Figure 1. Like a T-piece, the corrugated tubing serves as a reservoir. Because the catheter mount diameter is greater than the diameter of the endotracheal tubes used, the resistance of the circuit is largely determined by the narrowest portion, which happens to be the endotracheal tube itself. As the relationship is direct and linear according to the Hagen–Poiseuille equation, the resistance owing to the length of the catheter mount is also low. In resource-constrained settings, employing a catheter mount instead of T-piece achieves the same goal at a lower cost.

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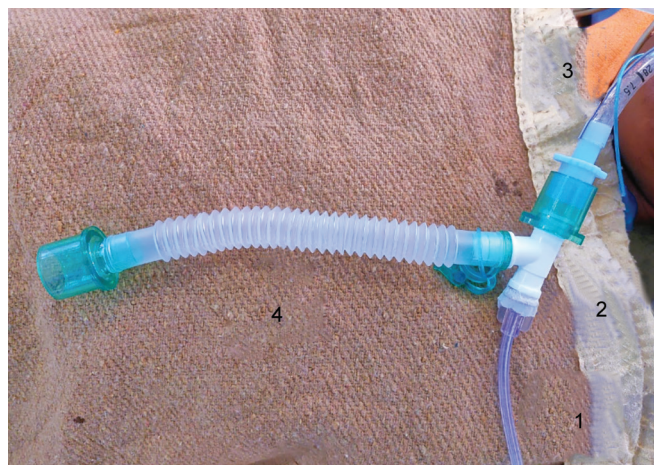


Fig. 1: (1) Oxygen from flowmeter; (2) Suction port with the cap removed attached to oxygen supply; (3) Endotracheal tube with 15 mm connector; and (4) Catheter mount with corrugated tubing

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