

# The use of the Passy Muir Valve with COVID-19 Veno-venous Extra Corporeal Membrane Oxygenation patients; a case series.

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## Introduction

Our Trust is a large academic and Veno-Venous Extra Corporeal Membrane Oxygenation (VV ECMO) national centre. During the first COVID-19 surge, our centre supported 35 patients using VV ECMO. This case series details the use of the Passy Muir one-way speaking valve (PMV) with four COVID-19 patients on VV ECMO; a new practice at our centre.

The use of the PMV is led by the Critical Care Area (CCA) Physiotherapists and has been used since 2019. Its use is infrequent due to the acuity of the patient cohort.

The four patients discussed had made little progress with their respiratory wean. They were unable to tolerate cuff deflation and therefore could not wean onto a conventional speaking valve despite increased ECMO support.

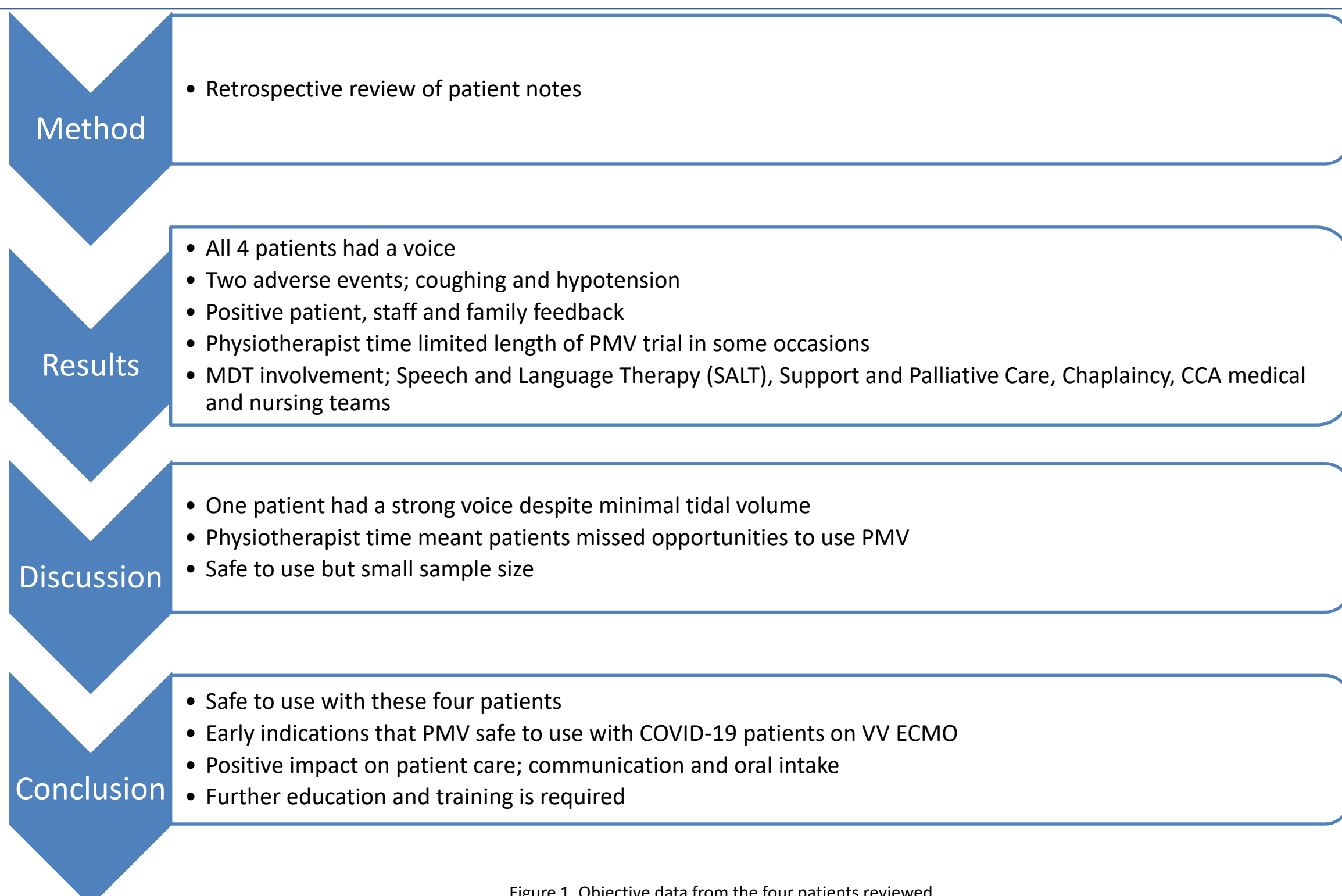


Image 1. COVID-19 patient on VV ECMO using PMV.



Figure 4. ECMO and ventilator settings during first PMV trial.

Patient	ECMO settings 1 <sup>st</sup> session	Ventilator settings 1 <sup>st</sup> session
One	RPM: 3,700 Sweep: 10 Flow: 3.8 L/min FiO2: 100%	PS/CPAP PS 16/ PEEP 5 VT: 253 ml
Two	RPM: 4,000 Sweep: 7 Flow: 4.4 L/min FiO2: 100%	SIMV PRVC RR – 0. Set – 20 PS 20/PEEP 10 VT: 19ml
Three	RPM: 2,950 Sweep: 9 Flow: 2.7 L/min FiO2: 100%	PS/CPAP PS 12/ PEEP 8 VT: 329ml
Four	RPM: 3,300 Flow: 3.5 L/min Sweep: 6 FiO2: 100%	PS/CPAP PS 8 / PEEP 9 VT: 515ml

Figure 1. Objective data from the four patients reviewed.

Objective data	Results	
	Mean	Range
Age	45	38-46 years
Length of stay	123 days	73-142 days
Day of first PMV session	Day 82	Day 62-109
Total number of PMV sessions per patient	10.7 trials	1-33 trials
Length of each PMV session in minutes	16.6 minutes	2-60 minutes

Figure 2. Subjective data from the four patients reviewed.

Subjective data	Results
Barriers to PMV use	<ul style="list-style-type: none"> <li>Lack of consultant agreement on one occasion</li> <li>Increased sedation</li> <li>Cardiovascular instability</li> <li>Patient consent</li> <li>Physiotherapist availability</li> </ul>
Reason for stopping PMV session	<ul style="list-style-type: none"> <li>Time pressures on Physiotherapist</li> <li>Coughing</li> <li>Patient request</li> </ul>
Adverse events	<ul style="list-style-type: none"> <li>Hypotension</li> <li>Coughing</li> </ul>

Figure 3. MDT involvement, feedback and voice quality.

