

---

## What's in a Name?

When It Comes to Modes of Ventilation, Sometimes "God Only Knows" !

Dana F. Oakes BA, RRT-NPS

Sean P. Shortall RRT-NPS, RPFT

---

### Introduction

A frustrating aspect of critical care today is the multitude of modes available on mechanical ventilators and their varying names. As new modes and new brands of ventilators continue to enter the market, the problem seems to be increasing.

When interpreting an ABG, knowing the mode of ventilation is every bit as important as the pH and PaCO<sub>2</sub>. Therefore, it is essential for the respiratory care practitioners (RCPs), physicians and nurses caring for mechanically ventilated patients to all be speaking the same language. Miscommunication may lead to orders that are detrimental to the patient. The focus of this article is an attempt to offer help in understanding the new modes of ventilation today.

Thirty years ago anyone could identify the make and model of every car coming down the road before it got within 500 feet of us. Then came the eighties and the nineties! Today, nearly every day we see new cars on the road we've never even heard of before. Likewise, thirty years ago there were only a few modes available on the majority of mechanical ventilators (control, assist/control, IMV, SIMV, and CPAP). Plus, with a few exceptions, volume ventilation was the only type of ventilation. Staff caring for patients found it relatively simple to order and document the settings the patient was receiving. If a physician ordered A/C, the RCP, the nurse, and the lab all knew exactly what the physician meant. Today, a majority of RCP's have a working knowledge of only a handful of the 20+ new modes available on the market – and doctors and nurses rarely have a clue.

"Interpreting" a mode is much like interpreting a blood gas – one must *first* know the parameters and *second*, understand how they all "fit together". To interpret a mode, one must *first* know the type of ventilation (i.e.; volume ventilation, pressure ventilation, or a combination of the two) and *second*, the mode classification (i.e.; how inspiration starts, sustains, and ends).

### Types of Ventilation:

Volume ventilation (also called volume controlled, cycled, limited, or targeted) is the delivery of a preset volume, whereas pressure ventilation (also called pressure limited or targeted) is the delivery of a preset

pressure. Pressure ventilation is further subcategorized into pressure control ventilation and pressure support ventilation. The combination of the two main types (also called dual control) is pressure ventilation with a volume guarantee. This is where a preset pressure is set, but then the machine is allowed to override it to deliver a minimum preset volume. Combination ventilation is further subcategorized according to how the breath is adjusted (breath by breath or within a breath). Still with us so far?

### **Mode Classification:**

How inspiration starts, sustains, and ends is also known as the trigger, limit, and cycle. Each of these three elements can be controlled by either the machine and/or the patient and how they are controlled (time, pressure, volume, or flow) helps determine the mode classification. Within any one mode the breath type may vary from breath to breath, such as an assisted breath or a controlled breath (i.e., assist/control). By putting the type of ventilation and the mode classification together, one can come up with a mode name that identifies what it is. For example, V-ACV is volume (ventilation) with assist/control ventilation and P-SIMV is pressure (ventilation) with synchronized intermittent ventilation. It would be ideal if every mode were named accordingly. Unfortunately, many of the newer mode names give little or no clue to identify how it ventilates a patient (e.g.; APRV, autoflow, Paug, etc.).

### **Final Thoughts**

Although a standardized system of nomenclature - in which the mode name clearly identifies how it works - would certainly be nice (like the old days), it is not likely to come into being in the near future, based on the complexity of ventilation and machines today.

Yesterday, nearly every male (and many females) could adjust the carburetor and change the tire on their car. Today, we need to look in the operating manual to even find where the jack is, God forbid ever having to use it! Gone are the "good ole days". In today's world, every clinician working with patient/ventilator interaction must simply "open the manual" and come to know the intricacies of each mode they are working with, regardless of its name.

To help make this reality easier, we offer in our book *Ventilator Management: A Bedside Reference Manual*, a quick and easy algorithm to "plug in" any mode name or abbreviation and within seconds have a detailed understanding of how the mode works, its indications, contraindications, advantages, disadvantages and risks. This is a quick and refreshing help for today's new world of ventilation.

In the future issues of *Foocus*, we will define and clarify some the different modes and types of ventilation. So, what's in a name? When it comes to modes, not only God should know, we all should.

*For more information on use of this article, please visit our website at [www.respiratorybooks.com](http://www.respiratorybooks.com). We are usually happy to provide limited reprint rights, but only do so upon request.*

*Information in these articles based on information contained within the book "Ventilator Management: A Bedside Reference Manual" by Dana Oakes and Sean Shortall.*