

How do you Describe a Ventilation-Mode? Iso 19223 Lung Ventilators and Related Equipment — Vocabulary and Semantics, ieee 11073 part 10101, snomed ct, hl7

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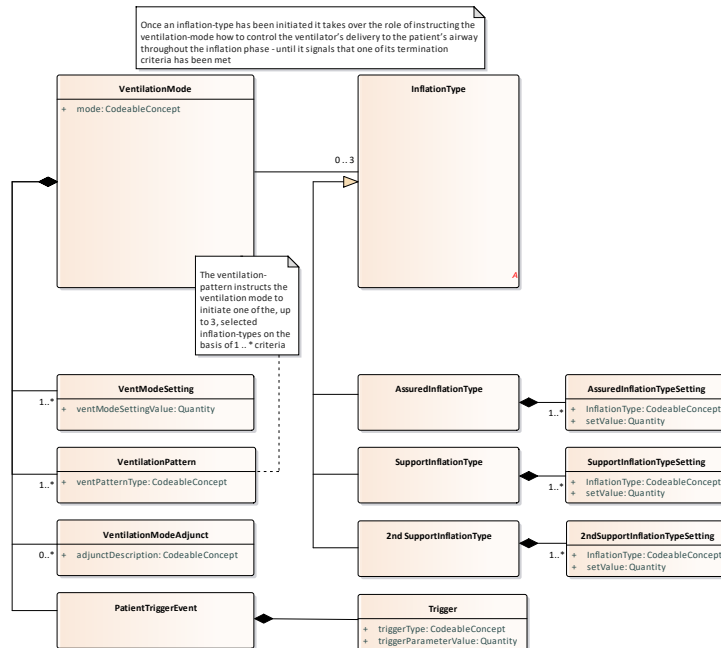
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Background/Introduction: Current ventilator terminology is often confusing. Different manufacturers call the same ventilator function by different names. A named ventilation mode on one ventilator interacts differently with the patient than one another ventilator using the same mode. Educators have difficulty teaching and evaluating students because of the wide range of meanings for the same term. How does one consistently specify ventilator settings for clinical orders, and record observations and patient-ventilator interactions in the Electronic Health Record (EHR) and data loggers (black-box)?

Results: The recently published ISO 19223 Lung Ventilator Vocabulary and Semantics was developed over a 15-year period to try to solve these difficulties. After much deliberations, it was determined that a fresh approach was needed. Ventilators inflate the lungs with specified *inflation-types* –Volume Control, Pressure Control, Pressure Support, Volume Targeted Pressure Control, Effort Support, Dual-Control resulting in 'breaths.' These inflations are organized into ventilation patterns–CMV, A/C, IMV, SIMV, S/T, CSV. Ventilation Adjuncts include the ability for patients to breath spontaneously concurrently with and between *inflations*–*assured constant airway pressure* or ACAP; endotracheal tube compensation, and sighs. *Inflations* are *initiated* as determined by the *ventilation-pattern* and *terminated* according to the *inflation-type* and patient interaction. A *ventilation-mode* is specified as:

ventilation-mode = *ventilation-pattern* + *inflation-type(s)* + what the mode allows the patient to do by themselves + *adjuncts*.

A coding system was devised to facilitate easy clinical order writing, for example **SIMV-vtPC\PS** (synchronised intermittent mandatory ventilation with volume-targeted pressure-control and pressure-support), **S/T-PS/PC(q)** (spontaneous/timed ventilation with pressure-support for spontaneous breaths and pressure-control with flow termination for ventilator-initiated breaths) where \='and' and /= 'exclusive or'. A Domain Analysis Model (below) was recently created to facilitate an unambiguous *ventilation-mode* description including all attributes and for breath by breath annotation for IEEE 11073, SNOMED CT and HL7. An educational resource, www.ventilatorvocabulary.online has been created to facilitate the understanding and application of ISO 19223 for clinicians, manufacturers and other interested parties.



Conclusion: An International standard for Lung Ventilator Terminology and semantics and the unification of International standards for ventilator vocabulary for clinical, EHR, data recorders, health informatics purposes will aid clinical care, research, and education and hopefully will reduce error and improve patient care.

References:

- <https://www.iso.org/standard/51164.html>
- <https://standards.ieee.org/standard/11073-10101-2019.html>