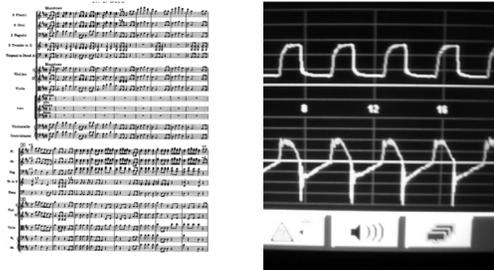


# GRAFICA VENTILATORIA

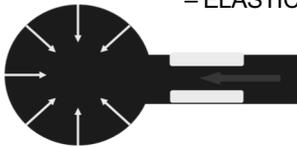
Klgo. Daniel Arellano, MSc

## Gráfica Pulmonar



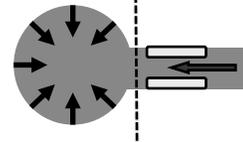
## Volumen y Presión

- El volumen debe vencer resistencias:
  - FRICCIONALES
  - ELASTICAS



## Ecuación de Movimiento Respiratorio

$$\text{Presión} = \frac{\text{Volumen}}{\text{Distensibilidad}} + \text{Resistencia} \times \text{Flujo}$$

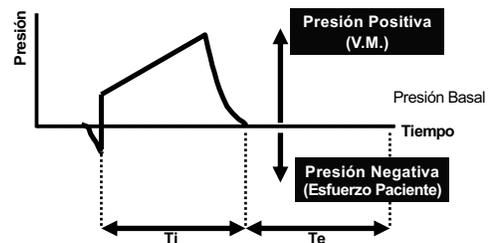


MacIntyre N., Branson R.: Mechanical Ventilation, 2001

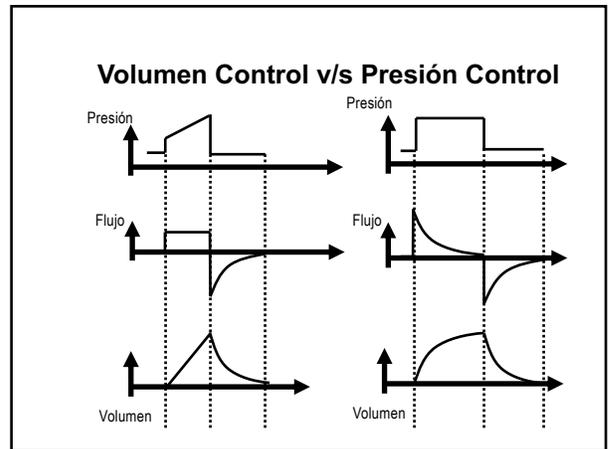
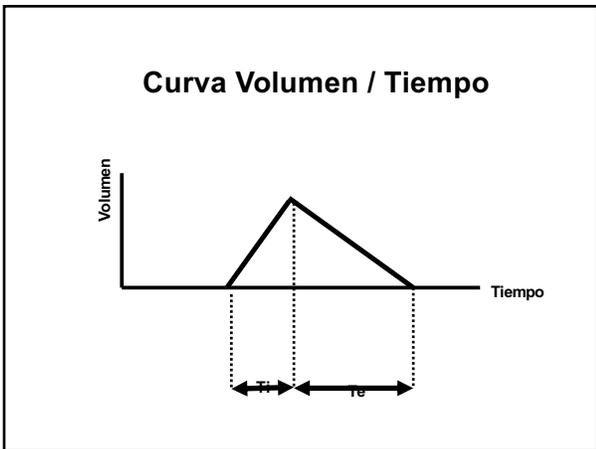
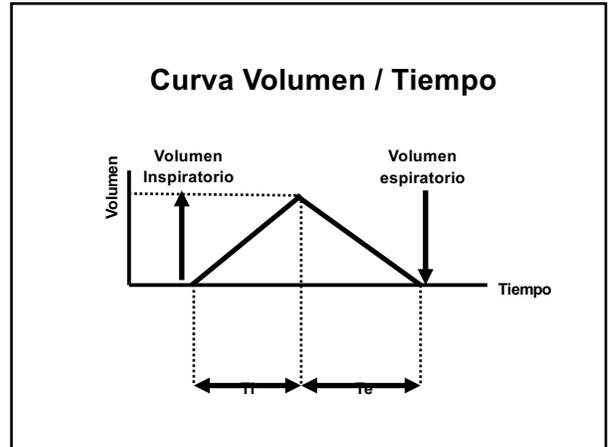
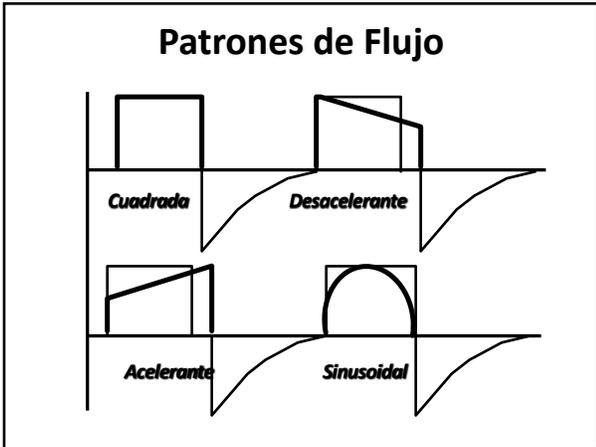
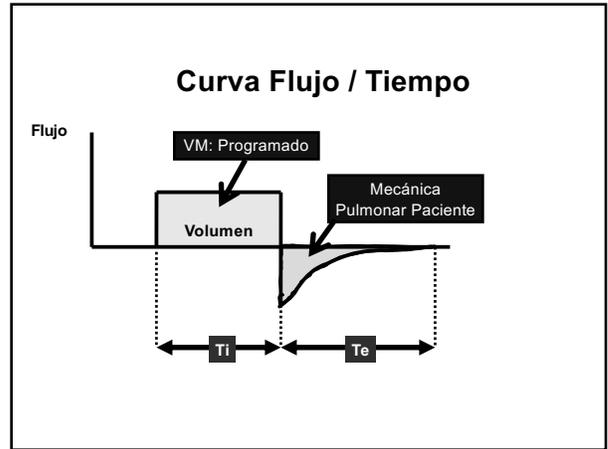
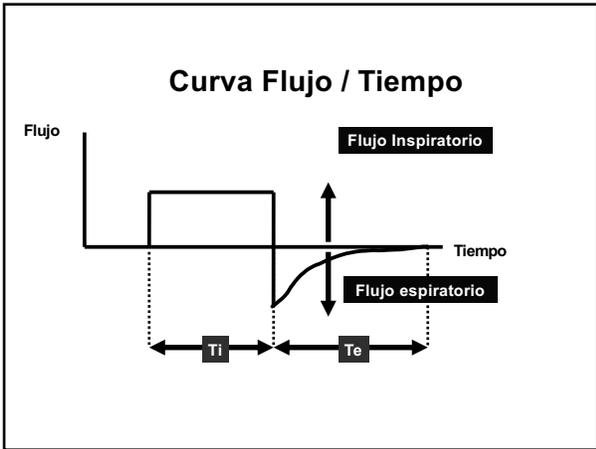
## Gráfica Pulmonar

- Curvas:
  - Presión / Tiempo
  - Flujo / Tiempo
  - Volumen / Tiempo
- Loops o Bucles:
  - Presión / Volumen
  - Flujo / Volumen

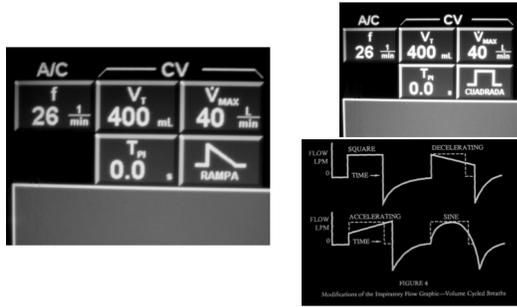
## Curva P/t Volumen Control



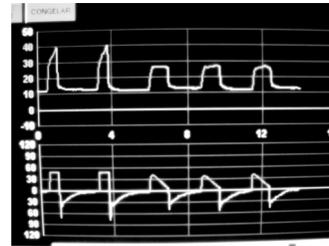
MacIntyre N. "Graphical Analysis of Flow, Pressure and Volume during Mechanical Ventilation". Third Edition. Editorial InterMed. Riverside, 1991



### Curva Flujo / Tiempo



### Paso flujo constante a desacelerante



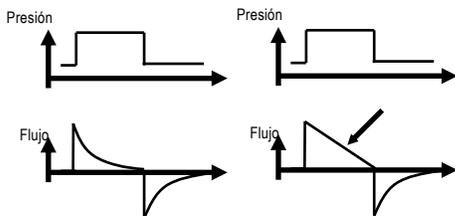
### ¿ Presión Control o Volumen Control ?



### ¿ Presión Control o Volumen Control ?



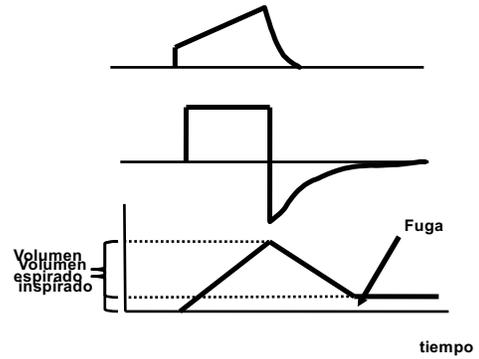
### Presión Control v/s Volumen Control



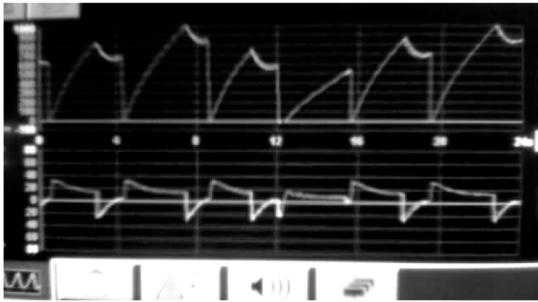
### ¿ Presión Control o Volumen Control ?



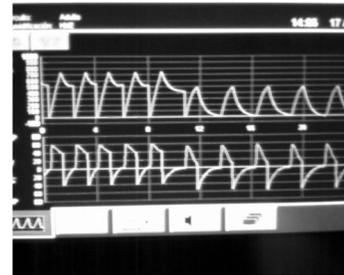
**Curva Vol/t**  
**¿Qué información**  
**entrega?**



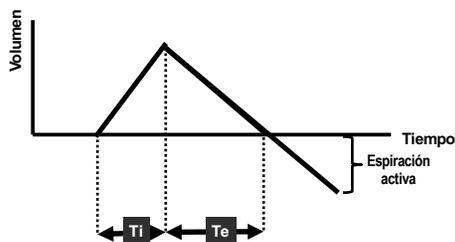
**Fuga**



**Cuff desinflado**



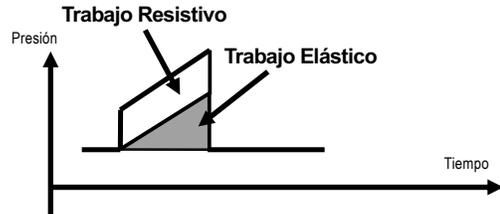
**Curva Volumen / Tiempo**



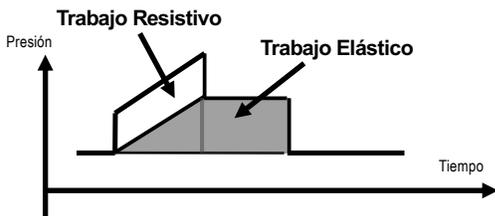
**Curva P/t**  
**¿Qué información**  
**entrega?**

## Curva P/t Volumen Control Flujo Constante

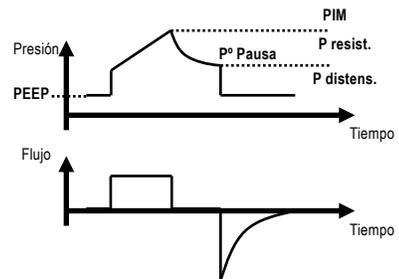
### Curva P/t Volumen Control – Flujo Constante



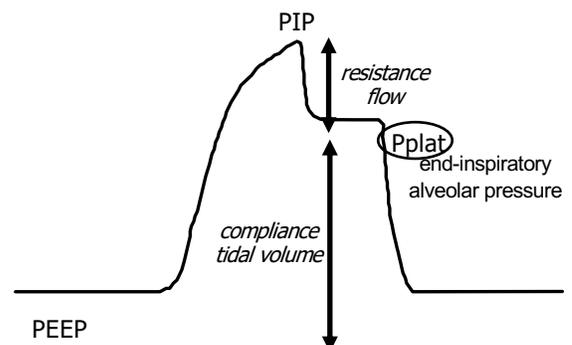
### Curva P/t Volumen Control

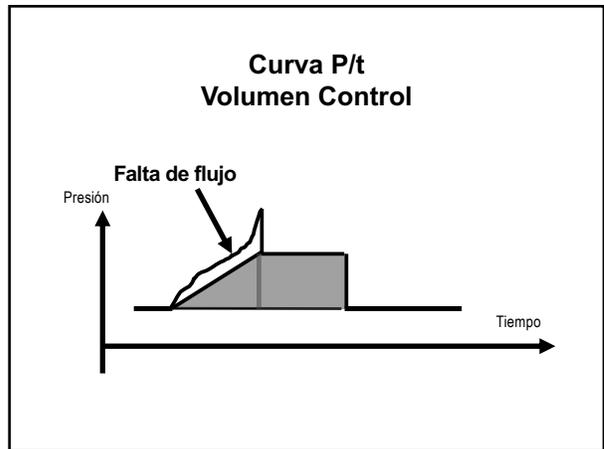
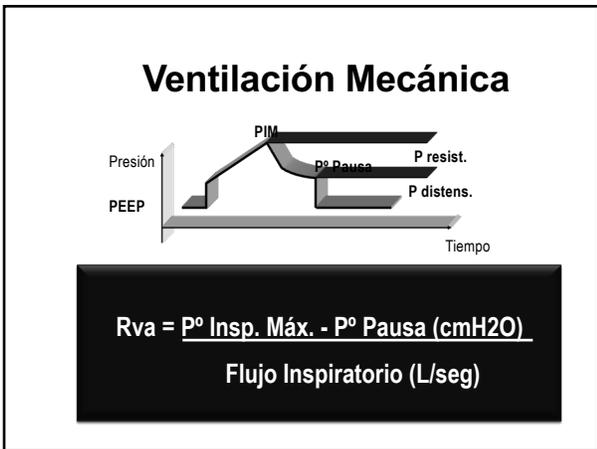
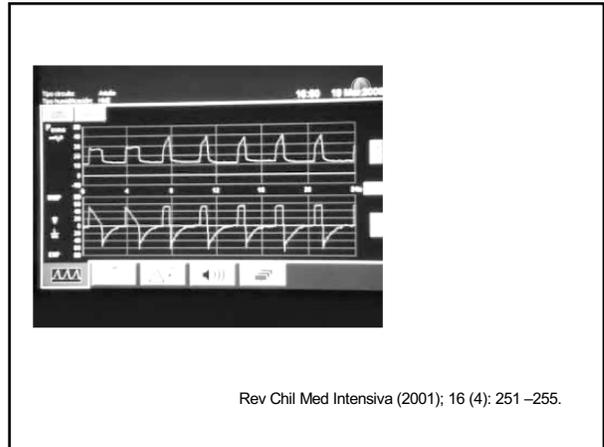
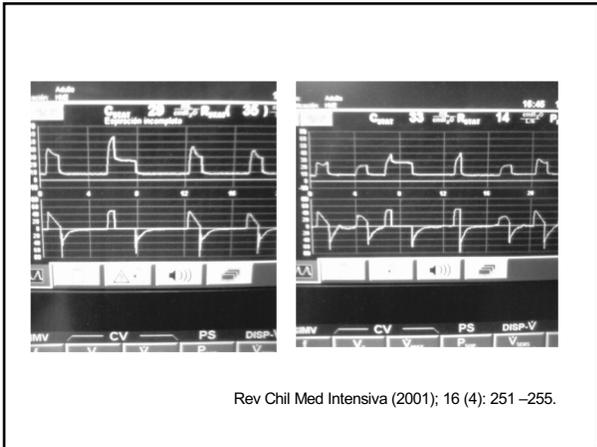
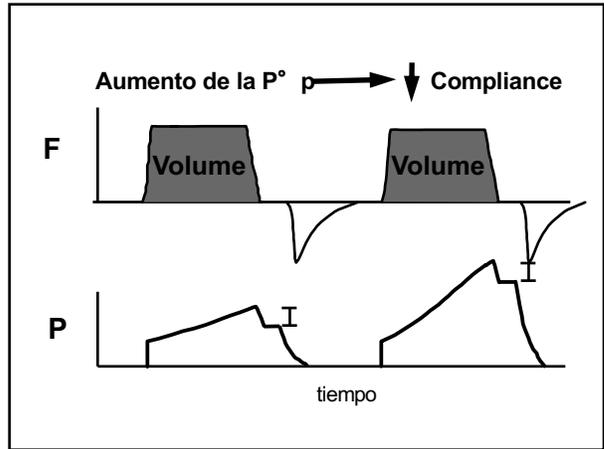
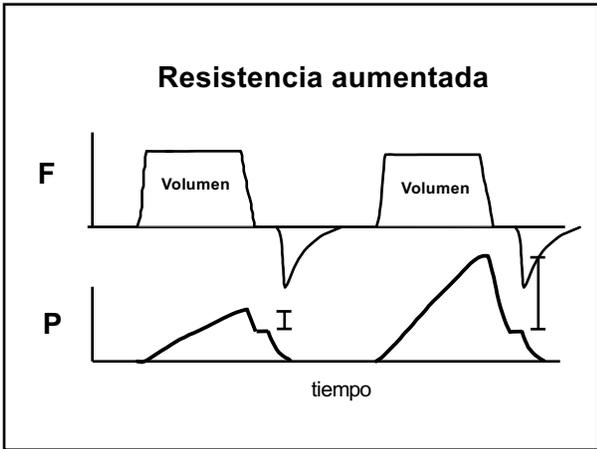


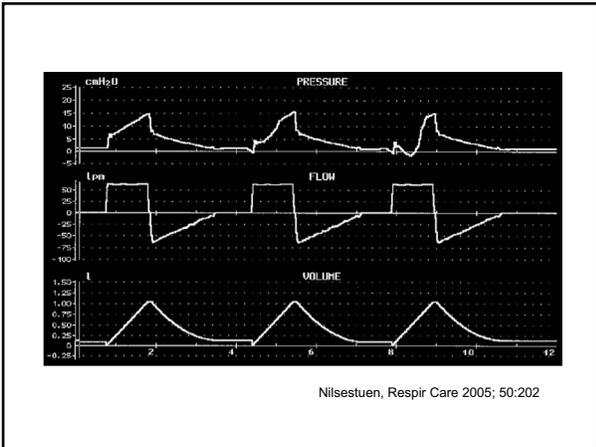
## Ventilación Mecánica



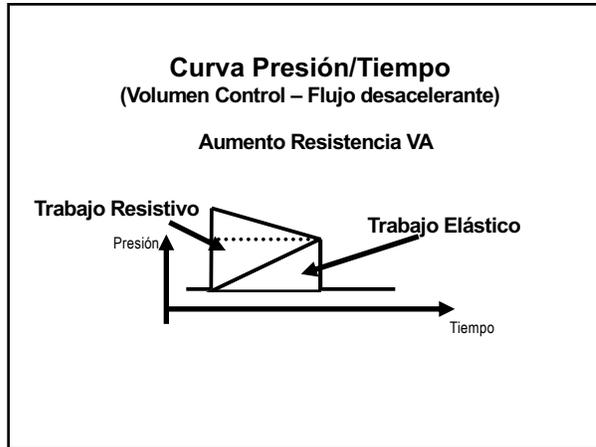
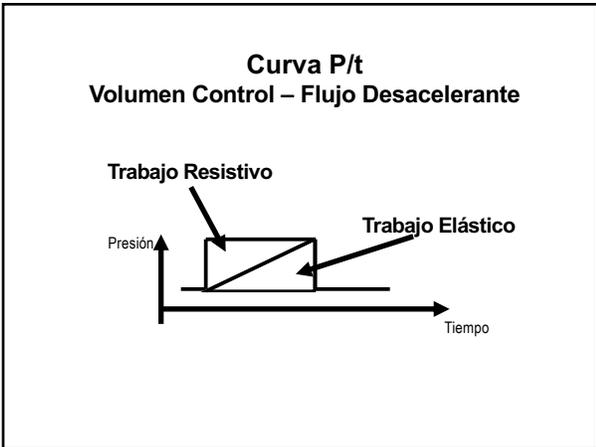
### Medición distensibilidad en VC



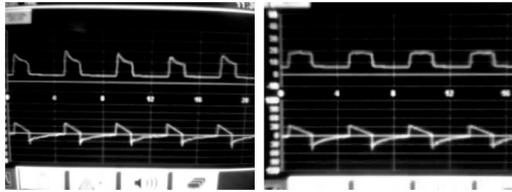




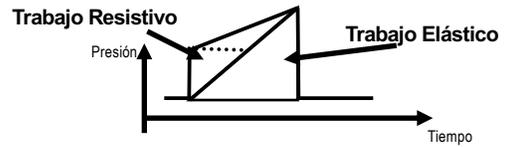
**Curva P/t  
Volumen Control  
Flujo Desacelerante**



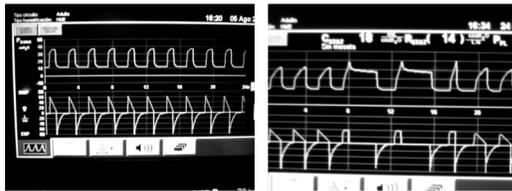
**Curva Presión / Tiempo**  
 Volumen Control – Flujo Desacelerante



**Curva Presión/Tiempo**  
 (Volumen Control – Flujo desacelerante)  
 Disminución Compliance



**Curva Flujo / Tiempo**



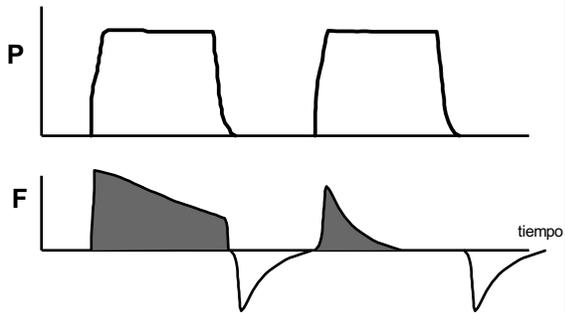
**Paso flujo constante a desacelerante**



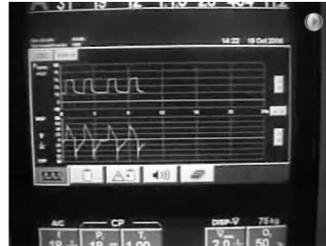
**Curva Flujo/tiempo**  
 ¿Qué información  
 entrega?

**Curva Flujo/tiempo**  
 Flujo Inspiratorio

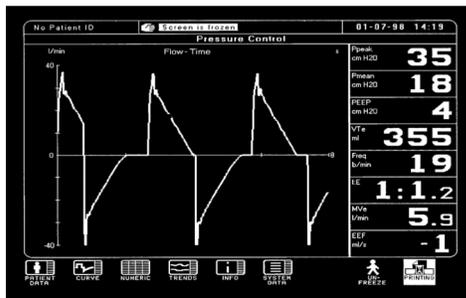
¿Y cómo se puede evaluar la Cest en Presión Control?



¿Y cómo se puede evaluar la Cest en Presión Control?

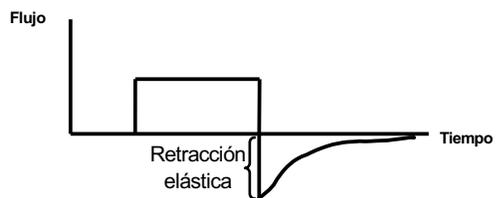


Tiempo Inspiratorio

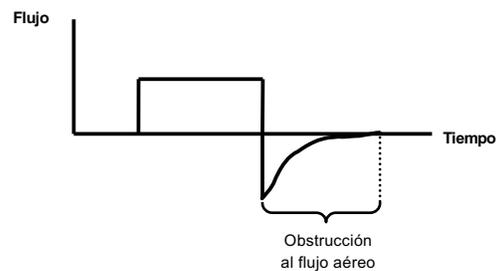


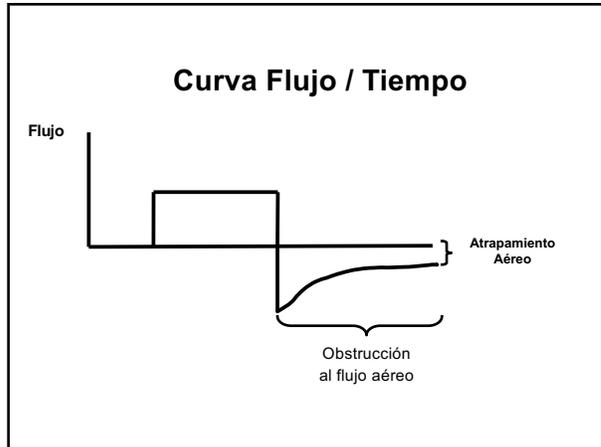
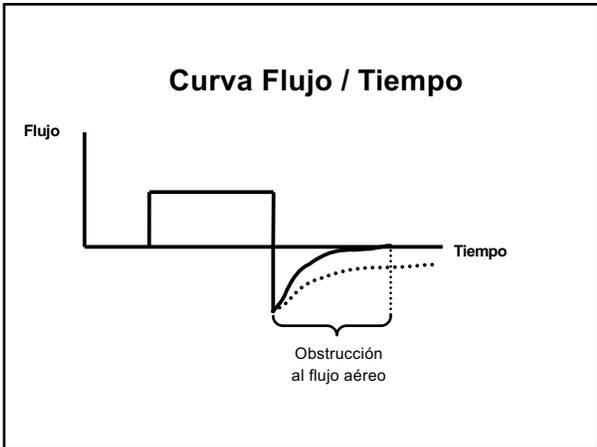
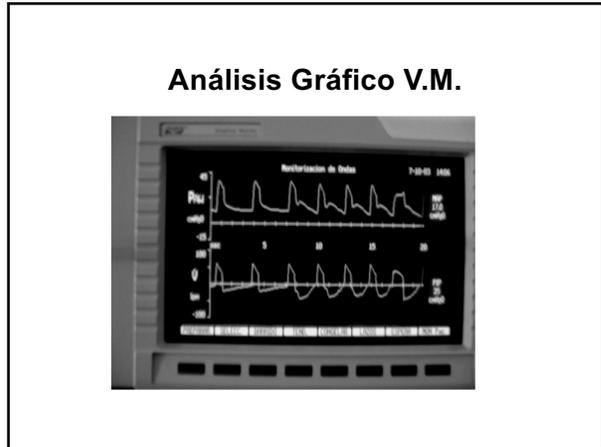
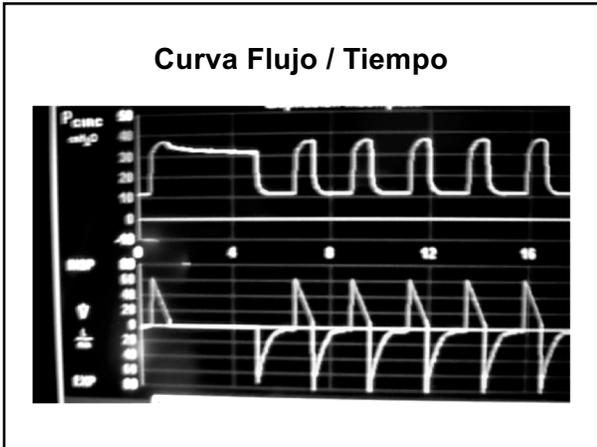
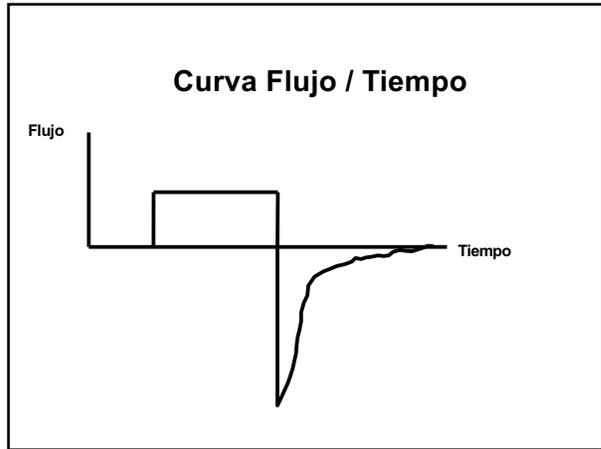
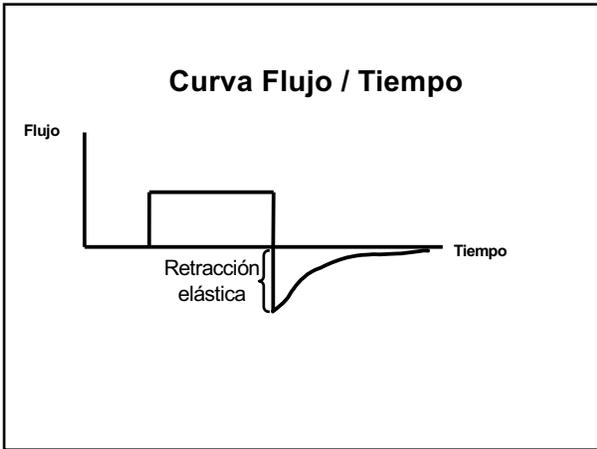
Curva Flujo/tiempo  
Flujo Espiratorio

Curva Flujo / Tiempo

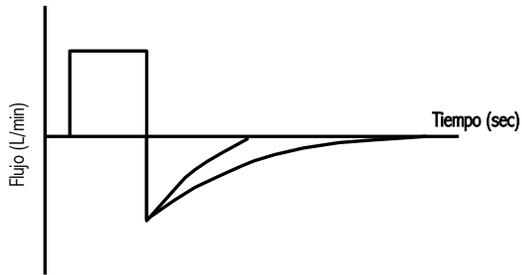


Curva Flujo / Tiempo

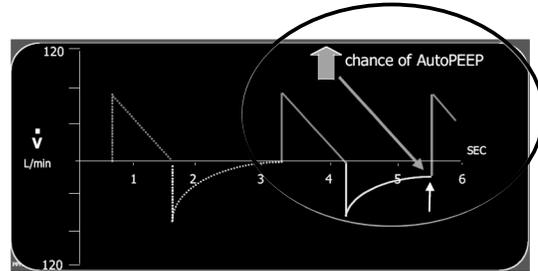




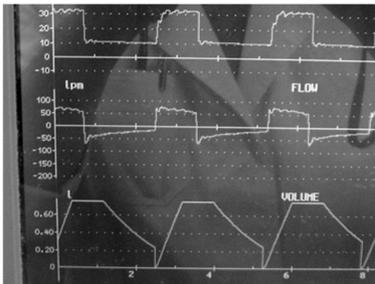
### Respuesta al Broncodilatador



### Flujo Inspiratorio Atrapamiento Aéreo



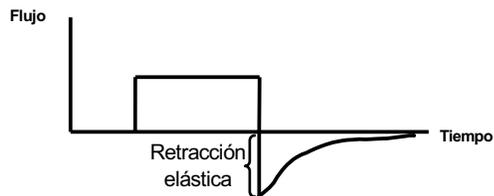
### Análisis Gráfico V.M.



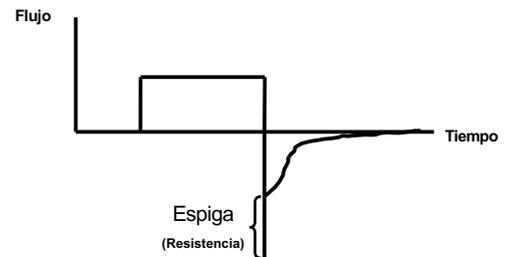
### Flujo Espiratorio Atrapamiento Aéreo



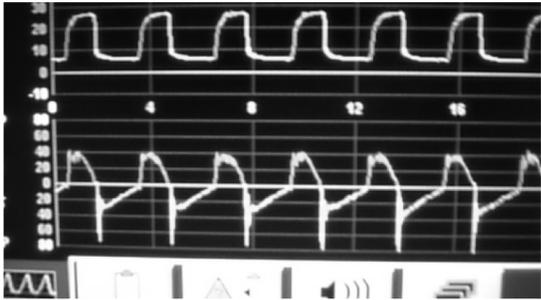
### Curva Flujo / Tiempo



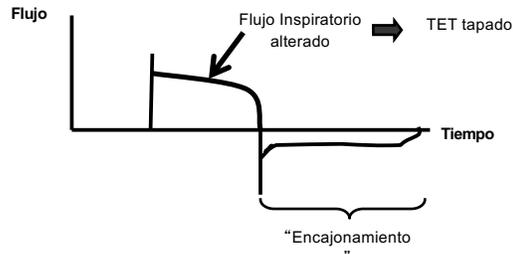
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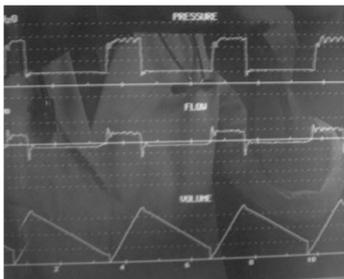
### Curva Flujo / Tiempo



### Curva Flujo / Tiempo Presión Control



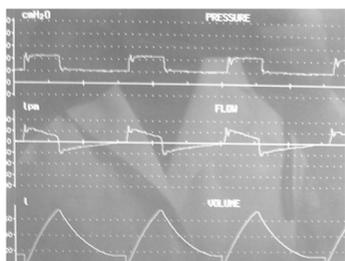
### Análisis Gráfico V.M.



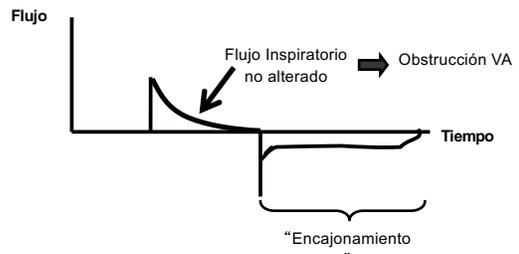
### Análisis Gráfico V.M.



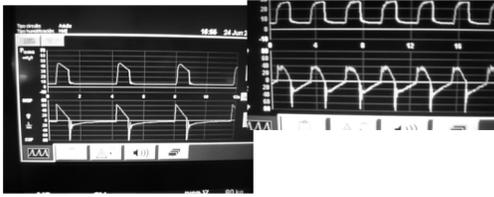
### Análisis Gráfico V.M.



### Curva Flujo / Tiempo Presión Control



### Grafica



VC

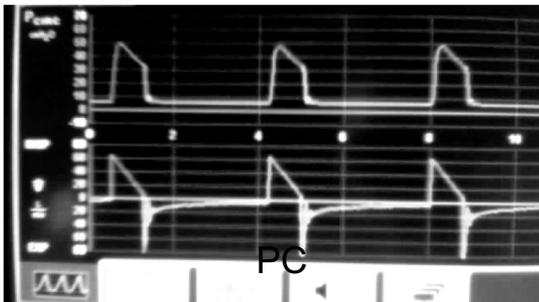
PC

### Grafica



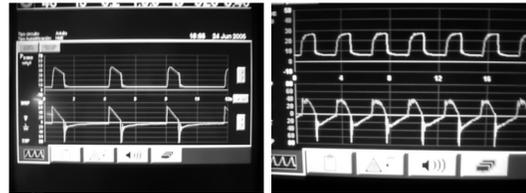
PC

### Grafica

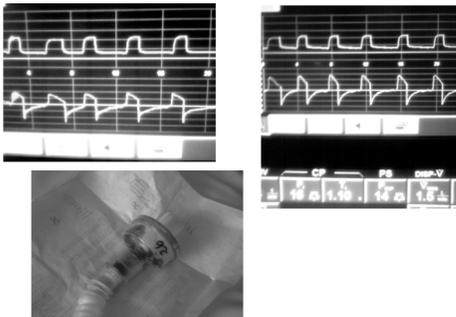


PC

### Curva Flujo / Tiempo



### Filtro Humidificador tapado



### Obstrucción TET

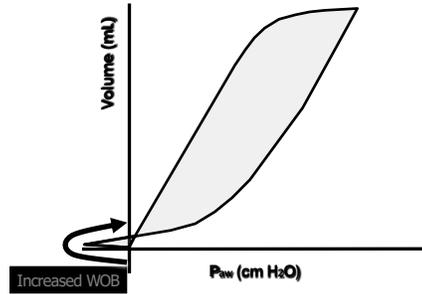




### Bucle Presión-Volumen



### Sensibilidad Inadecuada



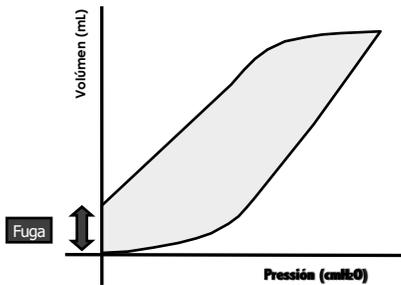
### Disminución Compliance



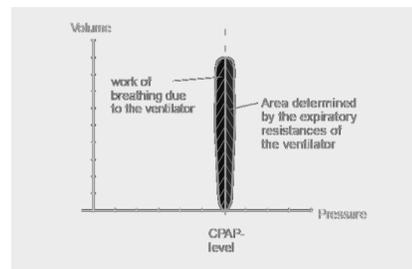
### Sobredistension



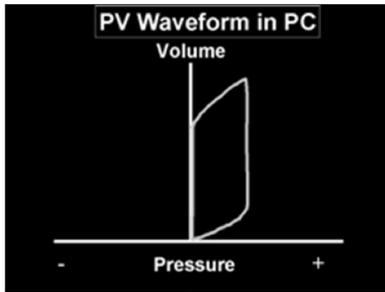
### Atrapamiento Aéreo



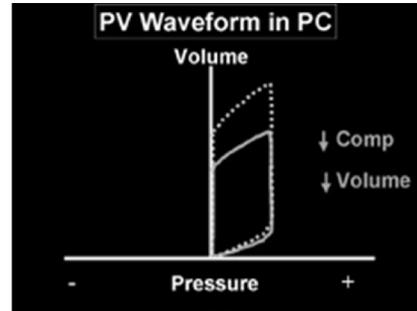
### Bucle Presión-Volumen CPAP



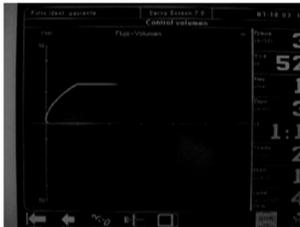
### Presión Control



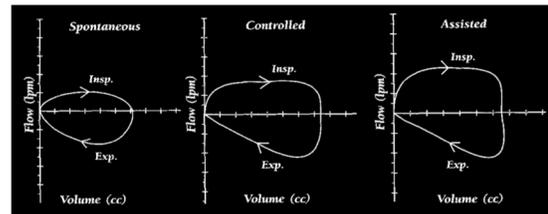
### Presión Control



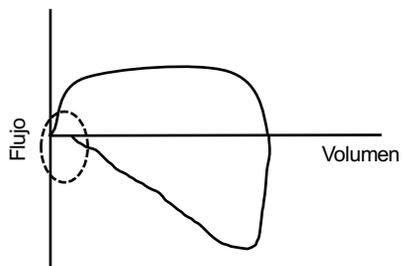
### Curva Flujo-Volumen Normal



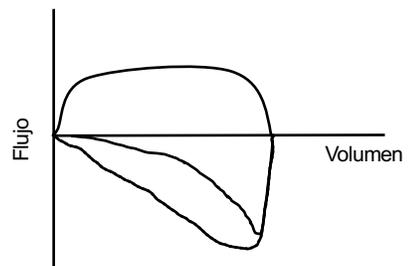
### Curva Flujo-Volumen Normal



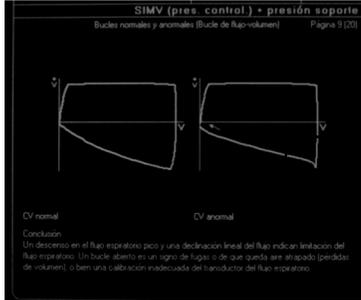
### Curva F-V: Fuga



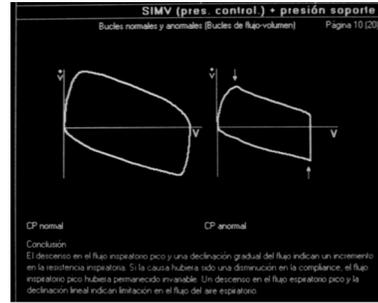
### Curva F-V: Obstrucción



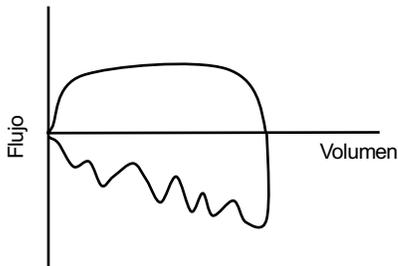
## Curva F-V: Obstrucción



## Curva F-V: Restrictivo



## Curva F-V: Secreciones



## Ability of ICU Health-Care Professionals to Identify Patient-Ventilator Asynchrony Using Waveform Analysis

Ivan I Ramirez PT, Daniel H Arellano PT CRT MSc, Rodrigo S Adasme PT CRT, Jose M Landeros PT CRT, Francisco A Salinas PT, Alvaro G Vargas PT CRT, Francisco J Vasquez PT CRT, Ignacio A Lobos PT, Magdalena L Oyarzun PT CRT, and Ruben D Restrepo MD RRT FAARC

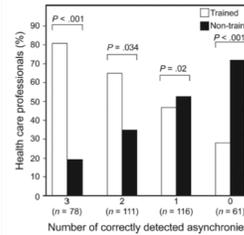


Table 3. Comparisons of Trained Versus Non-Trained and Experienced Versus Limited-Experienced Health-Care Professionals According to the Number of Patient-Ventilator Asynchronies Recognized Correctly

Number of PVAs Detected Correctly	Trained (n = 207)	Non-Trained (n = 159)	P	Experienced (n = 144)	Limited-Experienced (n = 222)	P
3 PVAs	63 (30.4)	15 (9.4)	<.001	32 (22.2)	46 (20.7)	.73
2 PVAs	72 (34.8)	39 (24.5)	.034	44 (30.6)	67 (30.2)	.94
1 PVA	55 (26.6)	61 (38.4)	.02	45 (31.3)	71 (32)	.88
0 PVA	17 (8.2)	44 (27.7)	<.001	23 (15.9)	38 (17.1)	.77

Values are expressed as n (%).  
PVAs = patient-ventilator asynchronies

Fig. 2. Intra-group comparison between trained and non-trained health-care professionals according to the number of asynchronies recognized correctly.

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### Análisis Gráfico de la Ventilación Mecánica

#### INTRODUCCIÓN

En los últimos años el aumento de la ventilación mecánica en el paciente crítico ha permitido el desarrollo de nuevas estrategias de ventilación que buscan mejorar el pronóstico de los pacientes críticos. En este artículo se revisa el uso de los gráficos de flujo-volumen para la identificación de las asincronías de paciente-ventilador y su impacto en el pronóstico de los pacientes críticos. Se discute cómo se relaciona la identificación de las asincronías de paciente-ventilador con el pronóstico de los pacientes críticos y se discuten algunas estrategias para su identificación y manejo.

#### CONCEPTOS BÁSICOS

La ventilación mecánica es un procedimiento que se utiliza para proporcionar oxígeno al paciente crítico que no puede respirar por sí mismo. Este procedimiento se realiza a través de un tubo que se inserta en la tráquea del paciente. El tubo se conecta a un ventilador que proporciona el flujo de aire necesario para la ventilación.

Por...  
¡¡ FIN !!