



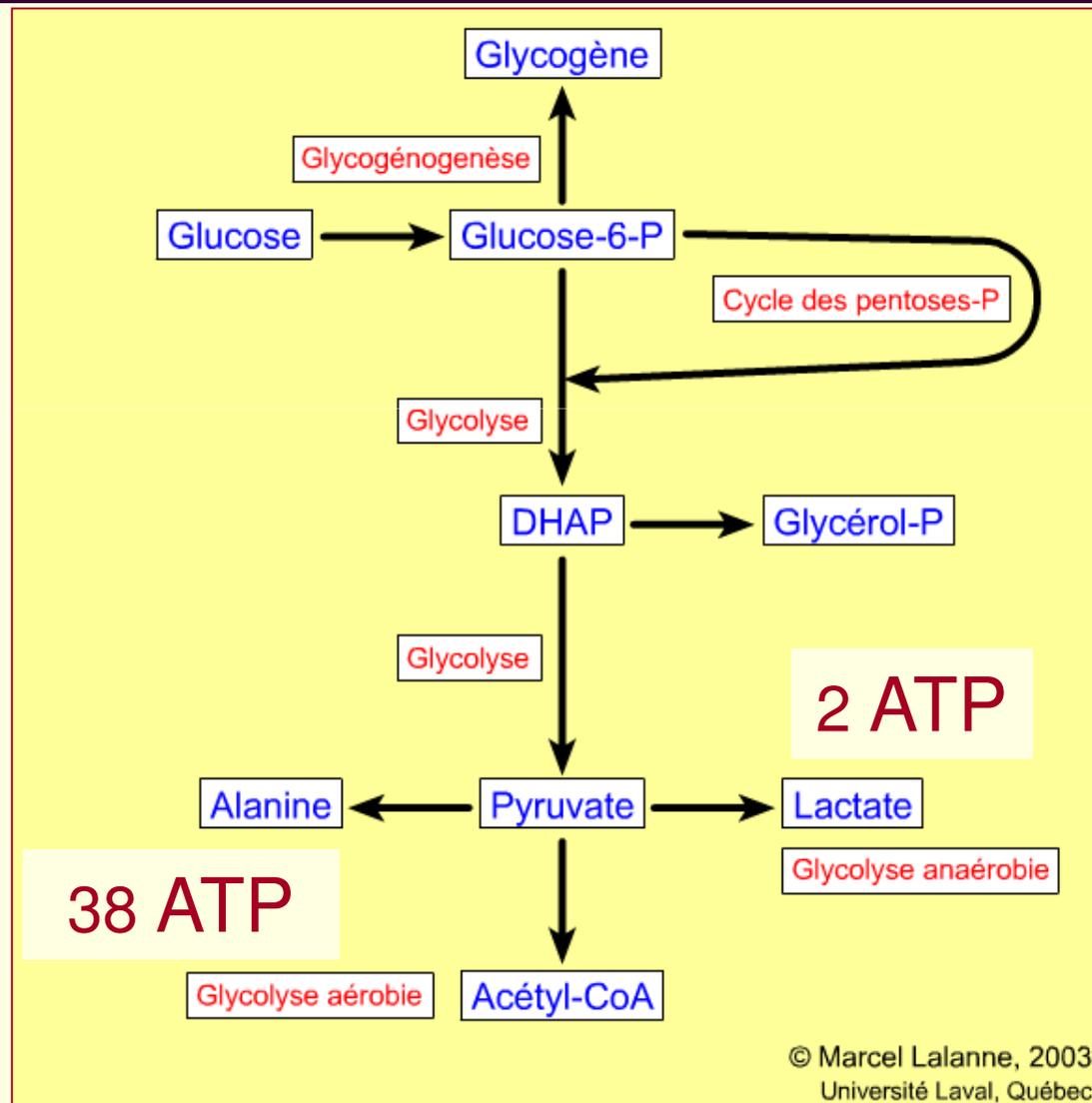
# Oxygénothérapie: avantages et inconvénients...

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Service des soins intensifs

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# Pourquoi faut-il oxygéner?





# Conséquences de l'hypoxémie

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- Vasodilatation périphérique  
d'où tachycardie et augmentation débit cardiaque
- Hypertension pulmonaire



# Quelques rappels...

- Apport d'oxygène= combien de  $FiO_2$ ?

## Table

- Dépend de la ventilation minute!

$V_{min} = 5 \text{ L/min}$

débit  $O_2 = 5 \text{ L/min}$

$V_{min} = 15 \text{ L/min}$

débit  $O_2 = 5 \text{ L/min}$



### O<sub>2</sub> Saturation Conversion Table<sup>a</sup>

Pulse oximetry O<sub>2</sub> saturation may be used for calculating PaO<sub>2</sub>/FiO<sub>2</sub> ratio when ABG is not available

SaO <sub>2</sub> (%)	Calculated PaO <sub>2</sub>
80	44
81	45
82	46
83	47
84	49
85	50
86	52
87	53
88	55
89	57
90	60
91	62
92	65
93	69
94	73
95	79
96	86
97	96
98	112
99	145

### Conversion Table for FiO<sub>2</sub> When Measured on Mask or Nasal Cannula

#### Nasal Cannula

100% O <sub>2</sub> Flow Rate (L/min)	FiO <sub>2</sub> (%)
1	24
2	28
3	32
4	36
5	40
6	44

#### Oxygen Mask

100% O <sub>2</sub> Flow Rate (L/min)	FiO <sub>2</sub> (%)
5-6	40
6-7	50
7-8	60
9	90
10	99+

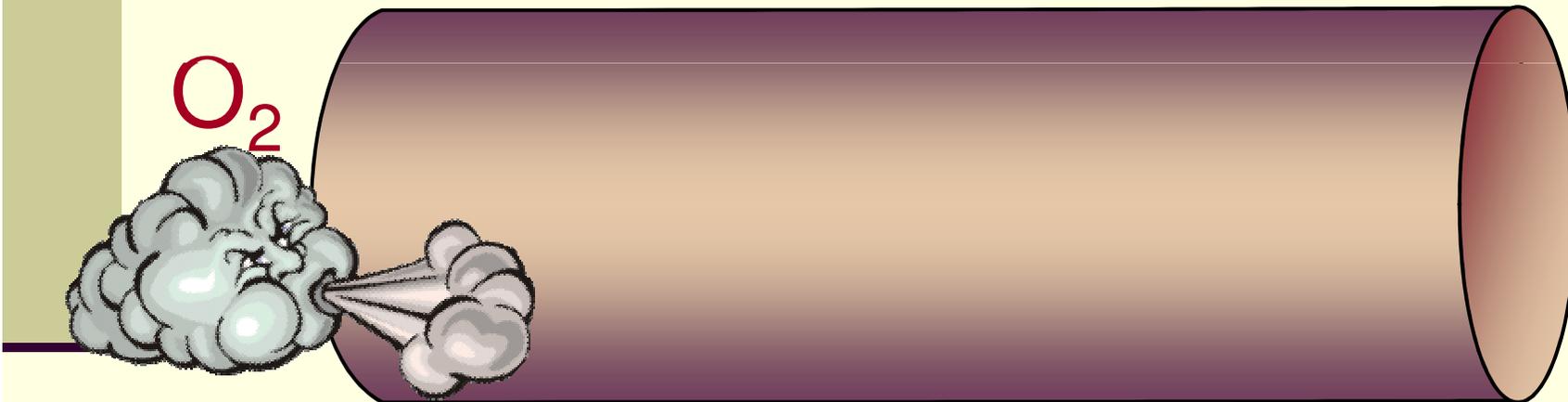
#### Mask with Reservoir Bag

100% O <sub>2</sub> Flow Rate (L/min)	FiO <sub>2</sub> (%)
6	60
7	70
8	80

<sup>a</sup> AARC Clinical Practice Guideline, In Vitro pH and Blood Gas Analysis and Hemoximetry, *Respiratory Care*, 38:505-510, 1993.

# Débit dans le tuyau

Débit  $O_2 = 5L/min$  et  $V_{min} 5 L/min$

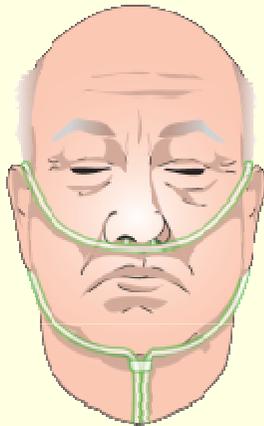


## D é b i t d a n s l e t u y a u

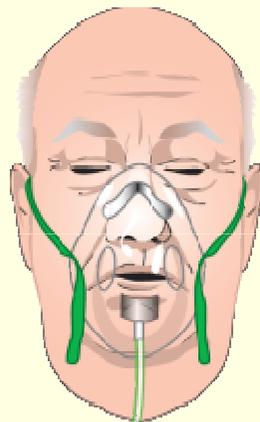
Débit  $O_2 = 5L/min$  et  $V_{min} 20 L/min$



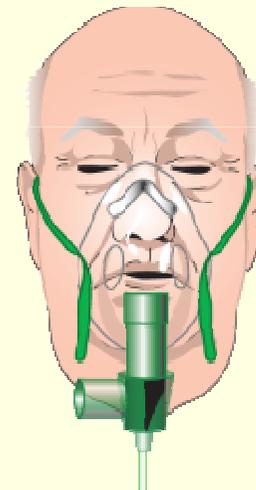
> Lunettes nasales



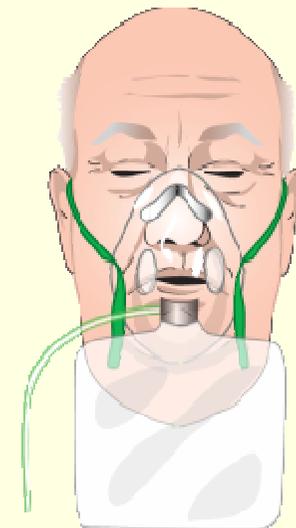
> Masque O<sub>2</sub>



> Masque à venturi



> Masque à haute concentration



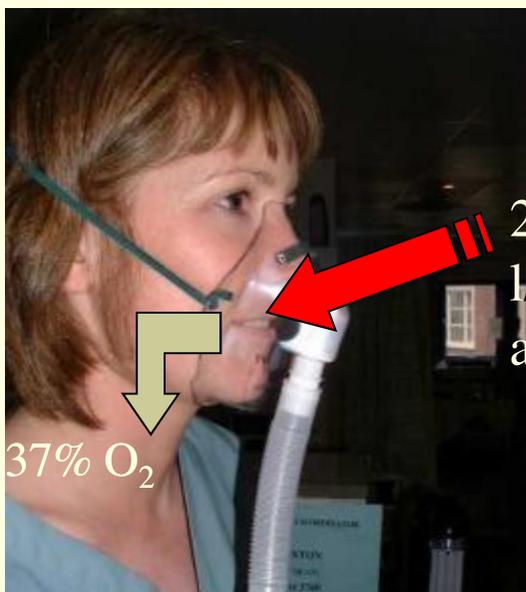
> Trachéotomie



# En pratique...

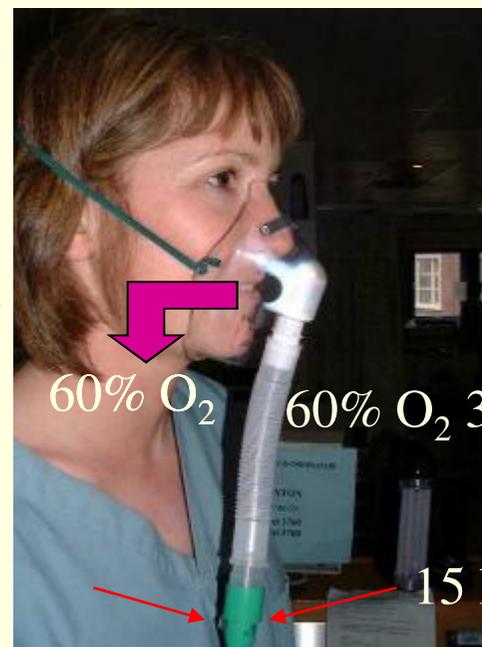


6 l/min O<sub>2</sub>



6 l/min O<sub>2</sub>

24 l/min air



60% O<sub>2</sub> 30 l/min

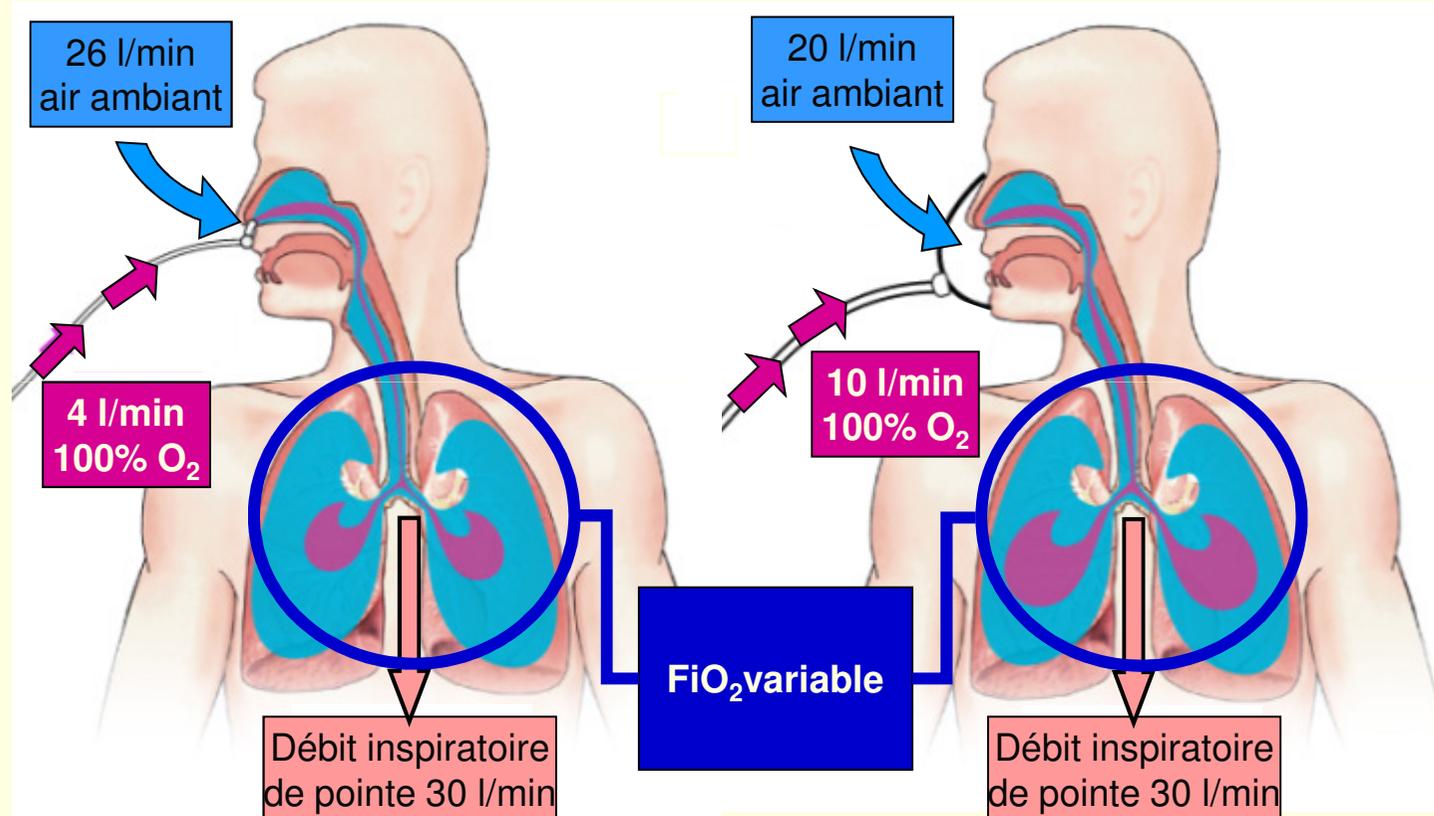
15 l/min air

100% O<sub>2</sub> 15 l/min

# Systemes actuels d'oxygénothérapie : 100% O<sub>2</sub> délivré, mais efficacité aléatoire.

**Pourquoi ?**

**Pendant l'INSPIRATION :**

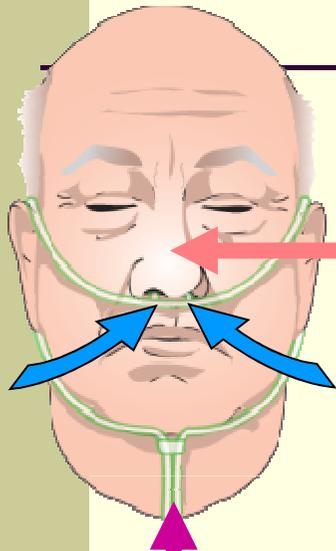


> Plusieurs études évaluent le **débit de pointe inspiratoire spontané**, pour l'adulte non-hypercapnique, à des **valeurs moyennes de 30 à 40 l/min.**

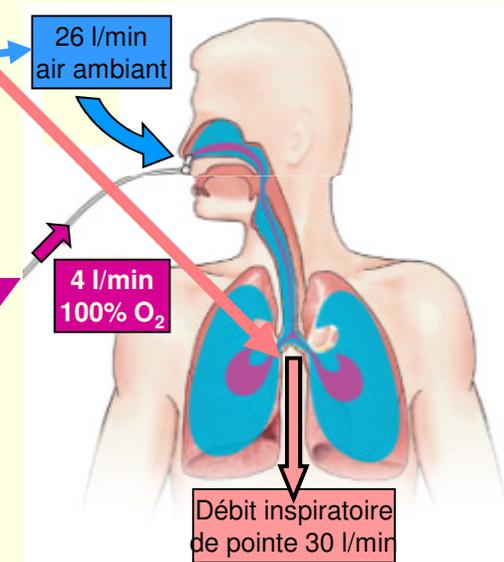
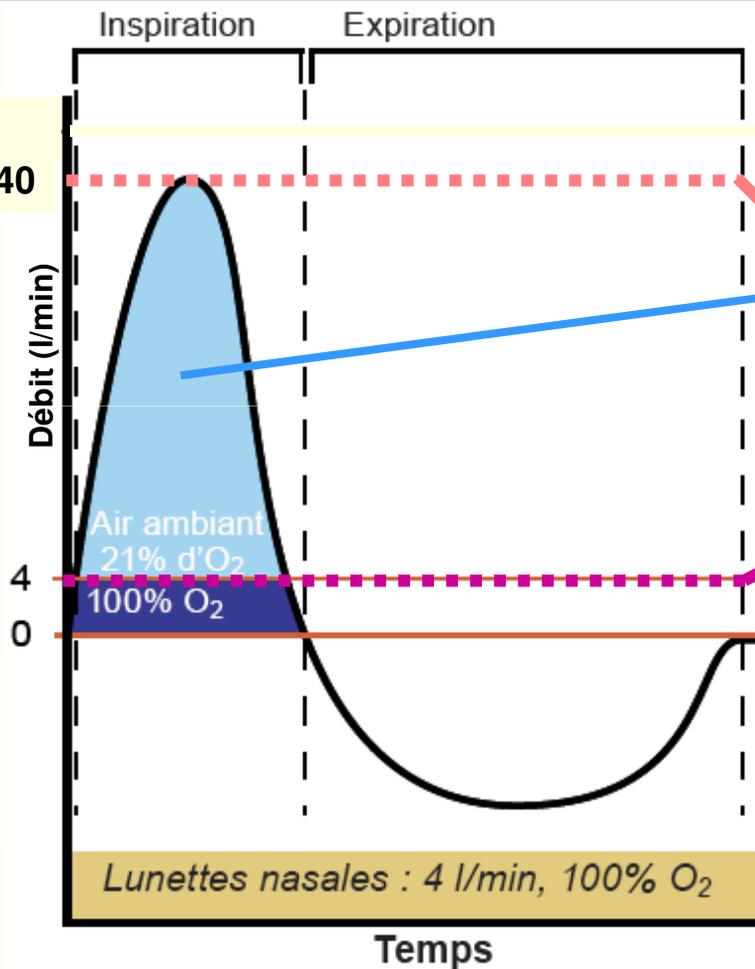
# Systemes actuels d'oxygénothérapie. 100% O<sub>2</sub> délivré, mais efficacité limitée.

Sur une courbe de débit respiratoire :

Pourquoi ?



FiO<sub>2</sub> limitée,  
inconnue,  
variable.





# Quelle oxygénation optimale?

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- Pa O<sub>2</sub> entre 55 et 80 mmHg
- Sat O<sub>2</sub> entre 88 et 95%



# Inconvénients de l'oxygénothérapie.

## ■ À $FiO_2 = 1$

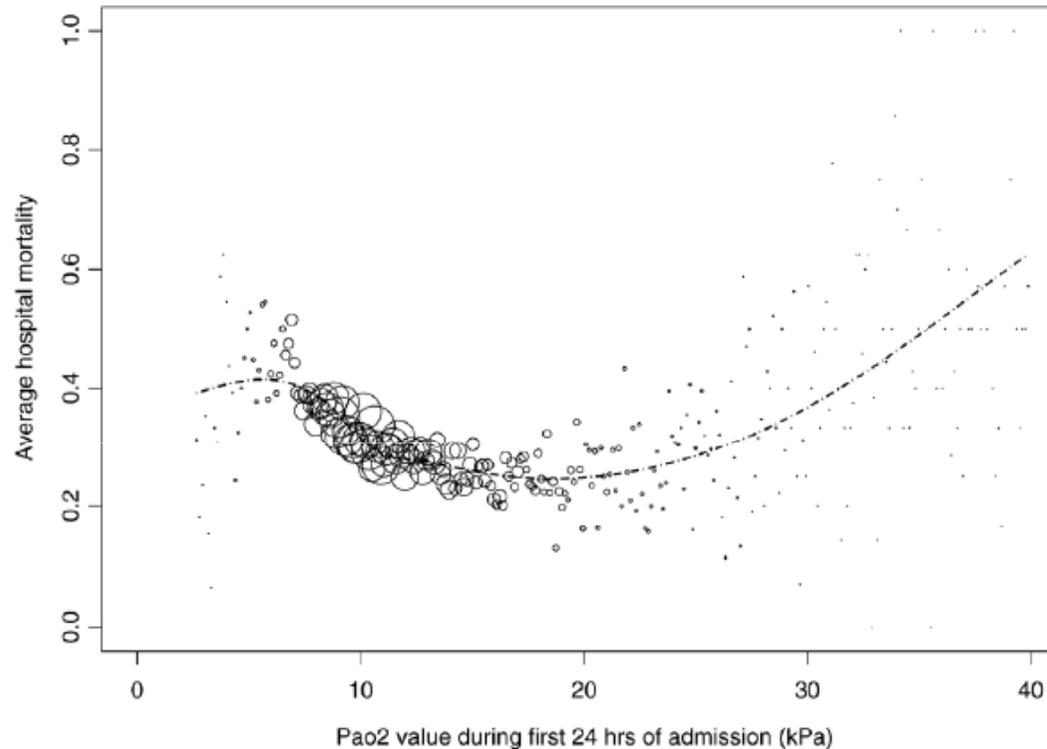
- chez l'animal: - fibrose pulmonaire
- Chez l'homme: - atélectasie
  - trachéobronchite
  - perturbation clairance cellulaire
  - œdème pulmonaire inflammatoire

## ■ Hyperoxie

- Augmentation des résistances vasculaires
- Diminution du débit cardiaque
- Radicaux libres oxygénés
- Sensibilité à la pneumonie (diminution action GBI)



# Inconvénients de l'oxygénothérapie.



**In-hospital mortality by partial oxygen pressure (PaO<sub>2</sub>) (kPa).** Values were taken from blood gas analysis with lowest PaO<sub>2</sub>/fraction of oxygen in inspired air (FiO<sub>2</sub>) ratio in the first 24 h after intensive care unit (ICU) admission. The sizes of the circles represent the number of patients with the same PaO<sub>2</sub> value. The curve represents the predicted mortality using the logistic regression equation in which the PaO<sub>2</sub> value was incorporated using a spline function.

*De Jonge, Crit Care,  
2008, R156*



