KIDNEY.EXE

RESPIRATORY ACIDOSIS

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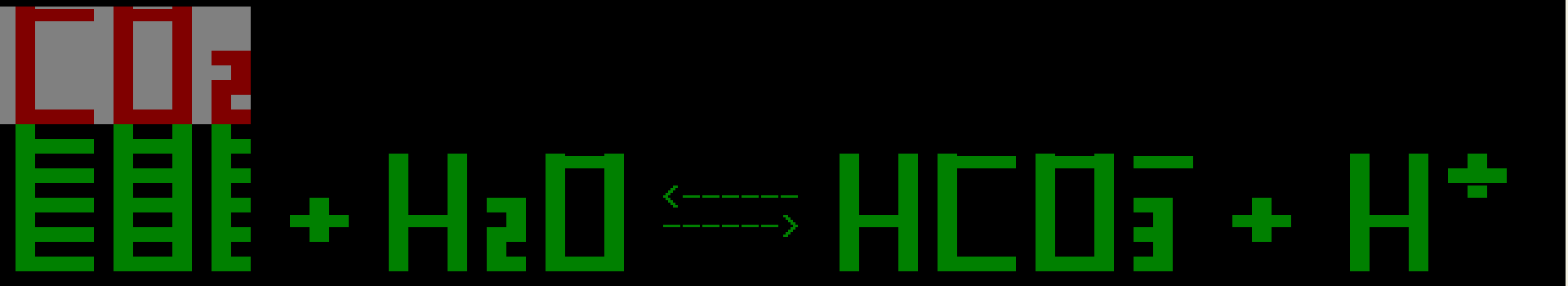


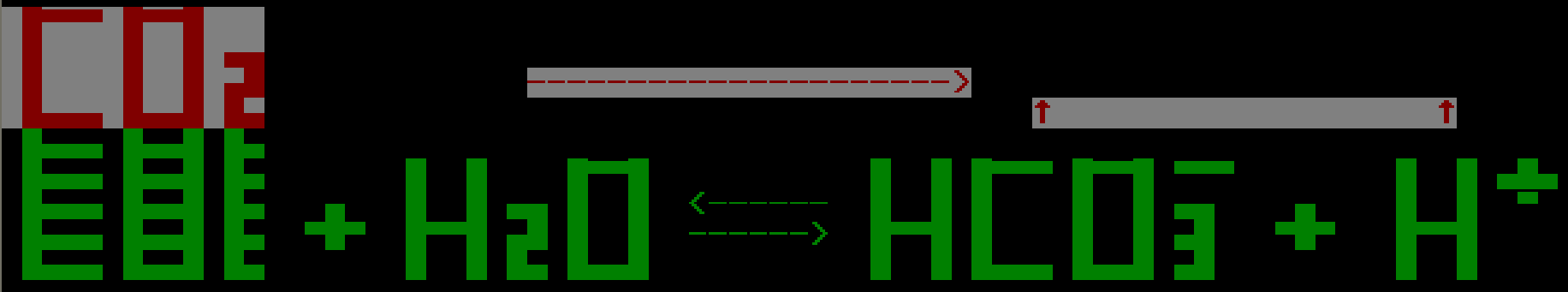
reduced ventilation

RESPIRATORY ACIDOSIS

Respiratory failure means that Carbon Dioxide elimination is reduced.

Consequently the pCO2 rises in the tissues.

This forces the equilibrium to shift to the right.

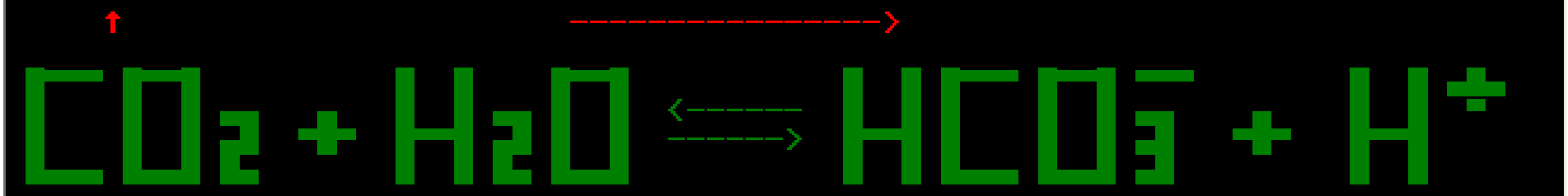


reduced ventilation

Therefore [H+] increases (pH falls....an acidosis) and [HCO3-] increases.

The CAUSE of respiratory acidosis is therefore:

1. A RISE IN pCO_2, which leads to a shift in the bicarbonate buffer system equilibrium resulting in:

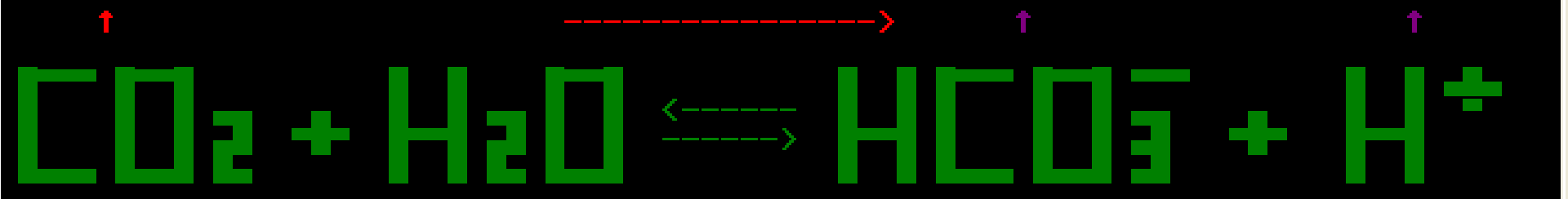


The CAUSE of respiratory acidosis is therefore:

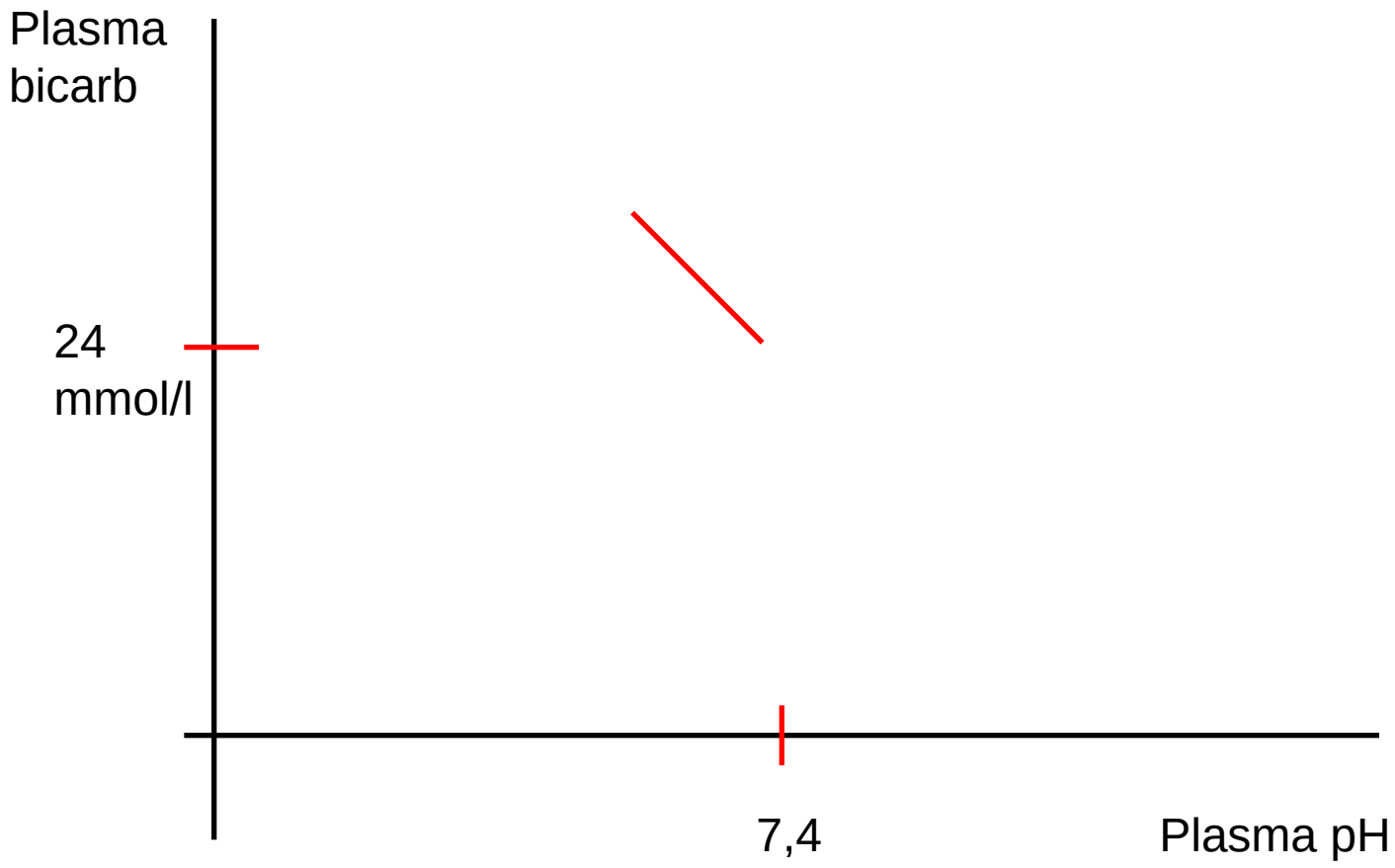
1. A RISE IN pCO2, which leads to a shift in the bicarbonate buffer system equilibrium resulting in:

2. A rise in [H+] and [HCO3-]

This is shown on a pH/bicarbonate diagram on the next page



Uncompensated Respiratory Acidosis

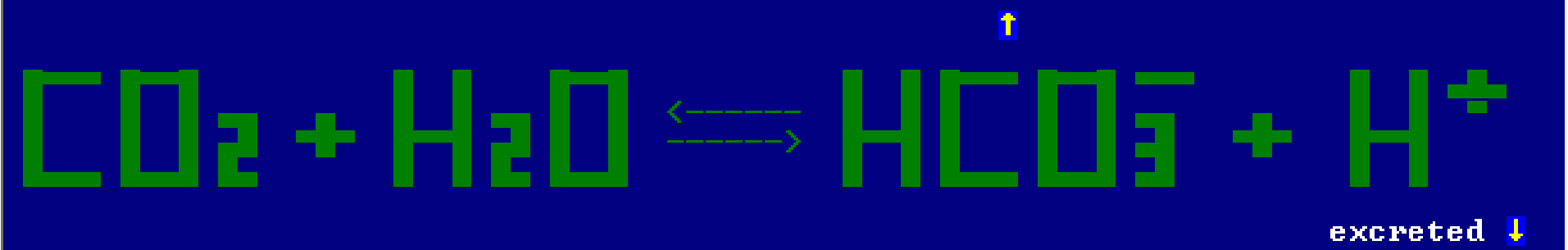


COMPENSATION for Respiratory Acidosis

Faced with a fall in pH (a rise in [H+]) the KIDNEY SECRETES MORE H+.

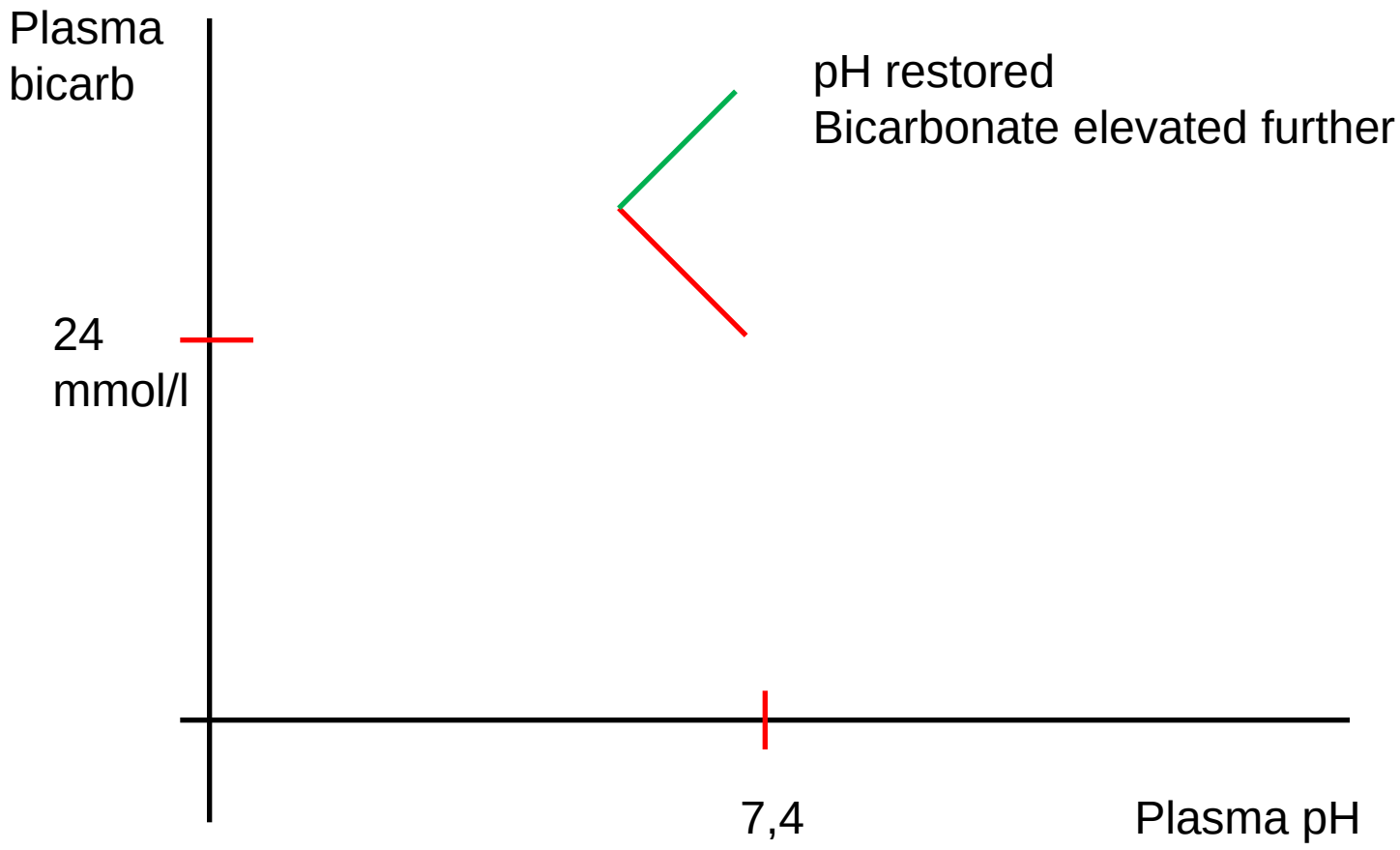
This tends to restore the pH towards normal, but the secretion of H+ by the kidney causes plasma bicarbonate to rise.

(This relationship between renal H+ secretion and plasma bicarbonate levels is explained more fully in the kidney tutorial).



On the pH/bicarbonate diagram we can now show RENAL COMPENSATION.

Renal compensation for Respiratory Acidosis



Respiratory Acidosis may be caused by any factor impairing ventilation

Bronchitis and emphysema
Airway obstruction (foreign body, tumour, constriction as in asthma
Damage or depresion to brainstem respiratory centre, eg morphine