***FLUID REPLACEMENT CALCULATIONS***

When calculating the fluid requirements of a patient, there are 3 elements to consider -

1. Replacement
2. Maintainance
3. Ongoing Losses

***Replacements*** are calculated based on the level of dehydration. Dehydration is based upon clinical assessment of each individual patient. Most commonly, skin tent is used for assessment. To calculate the amount required for replacement within a 24 hour period, the percentage dehydration is used in the following calculation.

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| **Replacement = *% Dehydration* x *Bodyweight (kg)* x 10** |

***Maintainance*** is the basic rate which a patient requires during a 24 hour period. It is commonly calculated as 50ml/kg/24hr, or 2ml/kg/hr.

***Ongoing losses*** are calculated based on a predicted fluid amount lost by a patient within a 24 hour period. Common losses include vomitting and diarrhoea. It is often helpful here if the owners are able to give a detailed history as this makes it easier to predict the pattern of losses. In some patients there may be no ongoing losses and so this step can be skipped. To calculate the fluid requirement, the following calculation is used.

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| **Ongoing losses = *Amount per loss (ml/kg)* x *Bodyweight (kg) x*No. of losses** |

These calculations are then added together to allow for the total fluid requirement in a 24 hour period. It is important to assess these requirements on a daily basis as losses may be increased/reduceed for example.

The calculated fluid requirement is multiplied by the bodyweight of the individual patient to give the total amount of fluid required for that patient as ml/24hr period. This is then further calculated depending on whether a drip pump is used or fluid rate is adjusted manually as shown below.

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| **Requirement per hour (ml/hr) = Requirement per day (ml/24hr) ÷ 24**  **Requirement per minute (ml/min) = Requirement per hour (ml/hr) ÷ 60**  **Requirement per second (ml/s)= Requirement per minute(ml/min) ÷ 60**  **Drops per second = Requirement per second (ml/s)x Giving Set Factor** |

***ACID BASE BALANCE***

Best evaluated by blood gas analysis but can also be done by clinical evaluation. The amount of base needed to correct the acidosis can be determined using the base deficit (BD) and the following equation:

***BD x 0.6 x Body Weight in kilograms = base equivalent in milliequivalents (mEq)***

0.6 is the correction factor for the “bicarbonate space” in a neonate. For the adult, 0.3 is appropriate.