Gas Man computer simulation mimics anesthesia care

Gas Man® computer simulation mimics anesthesia care and allows anesthesia care providers to improve patient safety.

Major surgery requires an anesthesia professional to give general anesthesia to a patient. This often begins with a drug injected in a vein but can begin with the inhalation of a gas or gases that produce general anesthesia. The beginning of this anesthesia administration is called anesthesia induction.

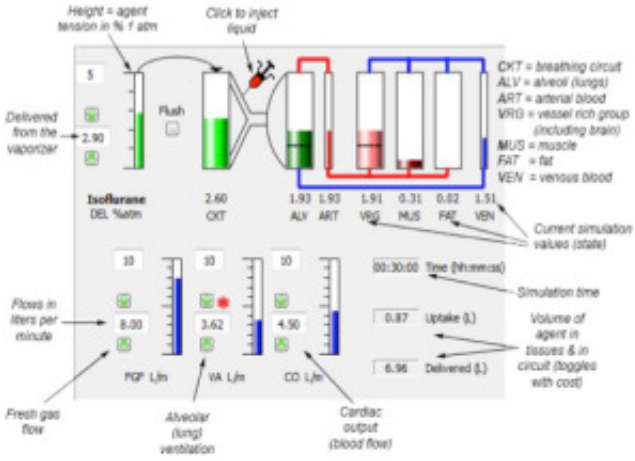

Fig. 1. shows the Gas Man picture with locations labeled.

After intravenous or inhaled drugs have produced anesthesia induction, continual inhalation of anesthetic gases maintain a steady level of anesthesia. If inhalation agents are used, gas concentrations inspired and expired are observed and recorded. The anesthetic level at the end of exhalation is easily monitored and is called the end-tidal value. This immediately becomes the value in the patient's blood and this level is established in the patient's brain with a time constant (or delay) of approximately three (3) minutes.

Gas Man® is a screen-based simulation program that depicts the anesthetic level in locations from the vaporizer to the site of action, the brain and spinal cord. Gas Man simulates past, present, and expected future anesthetic agents.

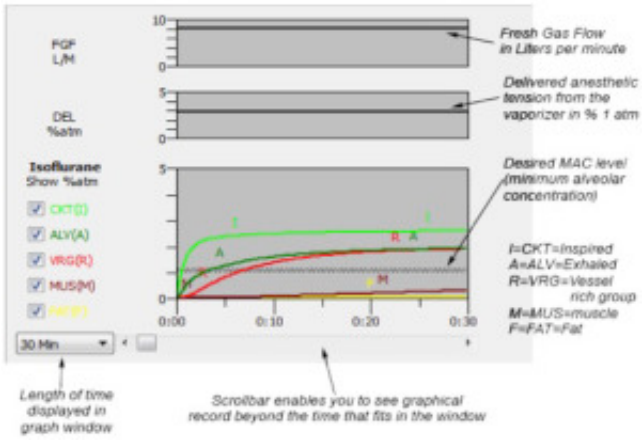

Fig. 2. shows the time course of general anesthesia.

Using this simulation provides in-depth knowledge of the subject matter. Experienced clinicians can simulate anaesthesia occurrences and practices for application to their clinical practice, and publish the results to benefit others to improve patient care. This manuscript summarizes published studies in which Gas Man demonstrated that previous understanding was incorrect.

Changing from one anesthetic to another (isoflurane to desflurane) toward the end of anaesthesia does not accelerate recovery. Deep breath induction can produce loss of consciousness in 45 seconds and complete general anesthesia shortly thereafter. Hyperventilation (increased ventilation) does not dramatically speed emergence. High fresh gas flow is wasteful and may not speed anesthesia induction. Fresh gas flow and not the vaporizer setting should be stopped during tracheal intubation. Re-anaesthetization can occur when breathing is inadequate after extubation. In re-anaesthetization, the anaesthetic redistributes from skeletal muscle, not from fat. Researchers using screen-based simulations can study fewer subjects to reach valid conclusions that impact clinical care.

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Using screen-based simulation of inhaled anaesthetic delivery to improve patient care.
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