A comparative study evaluating the effectiveness and safety of the generic sevoflurane (Sojourn, Safeline) and the original sevoflurane (Ultane, Abbott)

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Introduction
This study attempted to evaluate the effectiveness and safety of the generic product of sevoflurane. “Effective” for the purpose of this study refers to the ability of the drug to ensure an acceptable level of general anaesthesia.

Methods
Ethical approval was obtained. Ethics Committee reference number: M08/07/035. Sixty patients were included in this study. Inclusion criteria included: patients scheduled for elective surgery on the gynaecological and orthopaedic lists were used. It was emphasised to the patients that they would receive an appropriate anaesthetic for their particular surgery and if it meant that the best option would be general inhalation anaesthesia, they were asked for consent. Patients who were excluded: patients with a previous reaction to inhalation anaesthesia, malignant hyperthermia history, pregnant patients, children younger than 18 years, patients in whom an alternative anaesthetic technique would be in their best interest, a patient who refuses to participate in the experiment.

Premedication, anaesthetic and postoperative analgesia were standard. Standard monitoring was applied. A BIS monitor was used in every patient and it was accepted that a value between 30 – 45 would imply effective general anaesthesia (read in conjunction with the normal clinical indices of effective anaesthesia). A clinical technologist decided on which of the two options (Sojourn or Ultane) would be used first (by blind card draw). The vaporisers were both in line prior to the commencement of anaesthesia. Hence the study could not be blinded to researcher as she had to adjust the depth of anaesthesia as necessary. The anaesthetic was induced and maintained as clinically relevant with the BIS being stabilised between 30 and 45. Fifteen minutes after stabilisation of the expired inhalation anaesthetic concentration, patient data was obtained. The initial vaporiser was closed and the second vaporiser opened at the same concentration without changing either the ventilation or fresh gas flow. At 5, 10 and 15 minutes after the change over of the ventilator, patient data was again collected. The clinician had the right to adjust the anaesthetic depth as required in the best interest of the patient. However, once the vaporiser was changed, no changes were done (or were necessary).

Data was stored on an Excel spreadsheet and analysed with the software package Sigmasat. One way repeated measures ANOVA was used. If the test failed the normality test, the one way ANOVA was done on ranks. Post-hoc differences between groups were sought with the Tukey test. Comparison was done between the values obtained after stabilisation plus 15 minutes of the first drug and the subsequent 5, 10 and 15 minutes of the second drug.

Results
- BIS value: ANOVA on ranks were performed. No difference between the groups could be demonstrated (p = 0.867). The median values for 15, 5 and 10 minutes were: 38, 37, 36, 36.
- Inspired and expired concentration for the inhalation agent did not differ between groups for inspired (p = 0.328) and expired (p = 0.368) sevoflurane.
- The saturation (p = 0.974) and the alveolar ventilation (p = 0.854) did not vary between the 15, 5, 10 and 15 minutes.
- The fresh gas flow, tidal volume and frequency were stable and as per the protocol the p valued = 1.
- The temperature and heart rate (p = 0.990 and p = 0.578) and not change.
- Changes were detected in the systolic blood pressure.
- The normality test failed and a one way analysis of variants on ranks were performed. Median values for the 15 minutes were 110 mmHg, 5 minutes 115 mmHg, at 10 minutes 120 mmHg and at 15 minutes 117 mmHg. (H = 17.13 with 3 degrees of freedom, p = 0.001)
- The Tukey test showed that the 15 minutes before change of vaporiser differed from the 10 minutes and 15 minutes post change.

Conclusion
The initial hypothesis was satisfied i.e. there was no difference in the effectiveness of the generic and the original sevoflurane products. No side effects were registered for any of the drugs. There was a variation in systolic pressure after the switch of the anaesthetic agent but this cannot be ascribed to any specific drug.