ABBOTT

200 Abbott Park Road
Abbott Park, IL 60064

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Dear Health Care Professional,

Abbott Laboratories ("Abbott") would like to make you aware of rare, isolated reports of fire or extreme heat in the respiratory circuit of anesthesia machines when Ultane® (sevoflurane) is used in conjunction with a desiccated CO_2 absorbent. Although ongoing investigations have not yet identified the exact etiology, Abbott considers it important to inform anesthesia providers of the existence of these occurrences, which can result in patient injury. Ultane (sevoflurane) is indicated for induction and maintenance of general anesthesia in adult and pediatric patients for inpatient and outpatient surgery.

It is important to note that, in most of the reports of fire or extreme heat reported to Abbott, desiccated CO_2 absorbents were in use. In one case, our investigations to date cannot confirm whether or not desiccated CO_2 absorbents were involved.

Anesthesia providers should consider certain steps that might reduce the risk of these events occurring:

- If you suspect that the CO_2 absorbent may be desiccated because it has not been used for an extended period of time, it should be replaced.
- Although the exact conditions under which the CO_2 absorbent may become desiccated are not well defined, a low fresh gas flow rate over an extended period of non-use may contribute to unexpected desiccation of CO_2 absorbent materials on the anesthesia machine. Therefore, the anesthesia machine should be completely shut off at the end of clinical use or after any case when a subsequent extended period of non-use is anticipated.
- Turn off all vaporizers when not in use.
- Verify the integrity of the packaging of new CO_2 absorbents prior to use.
- Periodically monitor the temperature of the CO_2 absorbent canisters.
- Monitor the correlation between the sevoflurane vaporizer setting and the inspired Ultane (sevoflurane) concentration. An unusually delayed rise or unexpected decline of inspired Ultane (sevoflurane) concentration compared to the vaporizer setting may be associated with excessive heating of the CO_2 absorbent canister.

In addition, please consider the following:

- The color indicator in the CO_2 absorbents does not necessarily change as a result of desiccation. Therefore, the lack of significant color change should not be taken as assurance of adequate hydration. CO_2 absorbents should be replaced routinely regardless of the state of the color indicator.
- If excessive heat from the CO_2 absorbent canister is noted, evaluate the clinical situation and consider the following interventions to avoid or minimize possible patient injury:
  — Disconnect the patient from the anesthesia circuit.
  — Shut off fresh gas flow to the breathing circuit or remove the CO_2 absorbent canister from the circuit.
  — Replace the CO_2 absorbent.
  — Monitor the patient for carbon monoxide exposure and possible chemical or thermal injury.
- The following findings have been reported in association with these events of fire and extreme heat:
  — Failed inhalation induction or inadequate anesthesia with Ultane (sevoflurane)
  — Clinical signs of airway irritation, such as coughing
  — Oxygen desaturation, increased airway pressures, and difficult ventilation
  — Severe airway edema and erythema
  — Elevated carboxyhemoglobin levels
- Current information indicates that typically these cases of fire or extreme heat were the first case of the day for the specific anesthesia machine, and the domestically reported cases indicated Baralyme® CO_2 absorbent was used. However, cases of extreme heat associated with desiccated soda lime have also been reported in Europe.
- When desiccated CO_2 absorbents are used with Ultane (sevoflurane) under experimental conditions, flammable degradation products, including formaldehyde and methanol, may be present even in the absence of fire. The potential risk to patients receiving Ultane (sevoflurane) anesthesia due to these breakdown products has not been evaluated.[1]
- Clinicians should exercise caution in using potential ignition sources (e.g., electrocautery device) in an oxygen-rich environment near sites of potential gas leakage (e.g., open airway), including when using Ultane (sevoflurane).
- Halogenated anesthetics, including Ultane (sevoflurane), when exposed to desiccated CO_2 absorbents, can produce carbon monoxide.[2]

Abbott, in collaboration with the Food and Drug Administration, is investigating the causative and preventive factors surrounding the issues of fire, extreme heat, and potential breakdown products associated with the use of Ultane (sevoflurane) and desiccated CO_2 absorbents. Abbott will continue to provide timely guidance as relevant information becomes available.

Please review the steps to reduce the risk of fire and extreme heat included in this letter with your anesthesia associates.

A copy of the current Ultane® package insert is enclosed for your review. If you have additional questions regarding Ultane®, our Medical Information Department may be contacted by phone at 1-800-633-9110.

As with all medical products, health care professionals are strongly encouraged to report any serious adverse events that occur with the use of Ultane® either to Abbott Laboratories by phone (1-800-633-9110), or to the FDA's MedWatch program. The MedWatch form may be submitted online (www.FDA.gov/medwatch), by phone (1-800-FDA-1088), by fax (1-800-FDA-0178), or by mail (using postage-paid form) to MedWatch, 5600 Fishers Lane, Rockville, MD 20852-9787.

Sincerely,

Charles H. McLeskey, MD
Global Medical Director
Global Pharmaceutical Research and Development, Acute Care

References:

1. Holak EJ, Mei DA, Dunning MB III, et al. Carbon monoxide production from sevoflurane breakdown: modeling of exposures under clinical conditions. *Anesth Analg.* 2003;96: 757-764.
2. Wissing H, Kuhn I, Warnken U, Dudziak R Carbon monoxide production from desflurane, enflurane, halothane, isoflurane, sevoflurane with dry sodalime. *Anesthesiology 2001*; 95:1205-12.

Enclosure:

Ultane® Package Insert. Abbott Park, Ill: Abbott Laboratories.