



Original Article

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# Risk-Reducing Measures of Unexpected Electrical Power Failure During Surgery

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## Abstract

**Objective:** Electrical power failure during surgery is a vital patient safety issue. This study employed Healthcare Failure Mode and Effect Analysis (HFMEA) to eliminate unexpected electrical power failure during operations.

**Methods:** Applying HFMEA, we conducted a hazard analysis on “flowchart of electrical power supply in the operating room.” The hazard factors included the lack of staff awareness or familiarity with electricity usage, lack of education or training for electrical safety, ambiguous labels at switches of isolated power centers, baseload power and equipment power consumption, and sockets marked with the wrong colors. Staff were subjected to intensive electrical safety education, clear labeling was introduced at switches of isolated power centers, labels of baseload power and maximum power consumption were implemented to sockets and equipment plugs, unqualified sockets were substituted with qualified ones, and plug socket covers were installed to reduce risks of electrical power failure during surgery.

**Results:** No unexpected electrical power failures occurred during surgeries from June 2019 through May 2020.

**Conclusion:** By implementing security education and preventative measures for power failure, the adverse effects decreased during surgical operations, and patient safety in operating room was improved.

**Keywords:** operating room, HFMEA, unexpected electrical power failure

# 降低手術中不預期跳電之風險

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## 摘要

**目的：**術中發生跳電是病人安全中極重要的議題。本文運用醫療照護失效模式與效應分析(Healthcare Failure Mode and Effect Analysis, HFMEA)，達到術中無預期跳電事件為零之目標。

**方法：**以HFMEA進行「手術室供電系統流程圖」之危害分析。危害因素：錯誤的人員用電認知與行為、缺乏用電安全教育、隔離分電盤開關標示模糊、無負載量標示、儀器無耗電標示及手術房內插座顏色錯誤。藉強化用電安全教育、隔離分電盤、房間插座進行負載量標示、儀器插頭標示最大耗電量、更換不合格顏色插座及安裝插座防塵蓋，降低術中跳電之風險。

**結果：**由2019年6月追蹤至2020年5月，術中皆無跳電事件發生。

**結論：**完善的人員安全教育以及設備預防工作，可降低跳電的不良影響，提升病人手術安全。

**關鍵詞：**手術室、HFMEA、跳電