

## IMPROVING MANAGEMENT OF MALIGNANT HYPERTHERMIA (MH) IN THE IR AND MRI SUITE

Leonard Loh<sup>1</sup>, Pamela Chia<sup>2</sup>, Stefanie Chua<sup>3</sup>, Marianne Chee<sup>3</sup>, Samantha Wong<sup>3</sup>, Chong Shin Yuet<sup>4</sup>, Agnes Wongs<sup>5</sup>, Kenneth Yeos<sup>6</sup>

<sup>1</sup>Consultant, Department of Anaesthesiology, SGH

<sup>2</sup>Associate Consultant, Department of Women's Anaesthesia, KK Women's and Children's Hospital

<sup>3</sup>Junior Resident, Department of Anaesthesiology, SGH

<sup>4</sup>Senior Consultant, Department of Anaesthesiology, SGH

<sup>5</sup>Senior Nurse Manager, Department of Vascular and Interventional Radiology, SGH

<sup>6</sup>Radiographer, Radiological Sciences, SGH

### Aim

Malignant Hyperthermia (MH) is life-threatening and presents as a hypermetabolic crisis when susceptible individuals are exposed to certain anaesthetic triggers. In remote settings such as Interventional Radiology (IR) and MRI suites, staff are often not familiar with recognising and managing this rare condition.

We aimed to improve staff confidence levels in recognising and managing MH in IR and MRI by >25% over 12 months.

### Methodology

A fishbone diagram was created to identify the root causes of suboptimal MH management. Key causes included: availability of equipment/medications, inefficient processes and unfamiliarity of staff with MH. These were addressed by streamlining workflow, addressing latent threats, training of staff and enhancing the MH Box to international standards.

Our interventions included instructional lectures and in-situ simulations. 48 participants were divided into 4 groups, each participating in 2 MH scenarios using the SimMan 3G.

An 8-point questionnaire assessing participants' knowledge and confidence in MH recognition and management was administered pre- and post-simulation.

We measured the timings each team took for critical steps in the workflow, as a surrogate measure of effectiveness in MH management.

### Results

We received 28 responses. Participants' confidence and knowledge level showed a statistically significant ( $p=1.61 \times 10^{-07}$ ) improvement by 32% from 14.7 to 19.4 (out of 22).

Post interventions, all groups significantly reduced their time taken for Dantrolene, the definitive treatment, to be administered from the time of MH diagnosis. All groups after our interventions achieved this within the international standard of <10 minutes.

### **Conclusion**

In-situ simulation facilitates realistic team learning in the work environment whilst also identifying key latent threats which will directly affect patient safety. We have shown it improves confidence and knowledge in protocols for MH crisis management while reducing time taken to execute critical treatment steps. Future simulations are planned to train more staff.