

# 12<sup>th</sup> Nursing and Healthcare Congress

October 03-05, 2016 Vancouver, Canada

## The marked lines to prevent sucked accident of metallic ventilators in the magnetic resonance imaging examination

Shu-Chen Hsing<sup>1</sup>, Yu-Hsia Wang<sup>2</sup> and Chien- Chien Wu<sup>1</sup>

<sup>1</sup>Chi-Mei Medical Center, Taiwan

<sup>2</sup>Tainan Municipal Hospital, Taiwan

**Background:** Magnetic resonance imaging (MRI) is a very common examination for the patients in critical illness with mechanical ventilation, however, non-metallic equipment allow of these patients was instructed to prevent sucked accident of the metallic equipment into the magnetic bore of MRI scanner.

**Aim:** For patient's safety, the interaction between the MRIs magnetic force and metal ventilators were investigated, and a safety area was confirmed by two marked lines to prevent the sucked accident of ventilators.

**Materials & Methods:** The strength of a magnetic field of MRI scanner is measured in Gauss Units (Gs). Two MRI instrument; one is from Siemens 1.5T MRI, Germany, and the other from General Electric Company (GE) 3.0T MRI 2 (USA). Two Ventilator; one is traditional SERVO VENTILATOR 900C (900C), the other is MAQUET SERVO-i MR Environment (SERVO-i). The magnetic force of MRIs were detected and the colored tapes were used to mark for the prohibited, alerted, and safety areas.

**Results:** Traditional metallic Servo 900C is not recommended for the patients with mechanical ventilation to perform the 1.5 T MRI exam, however, some reports showed that it can be set up in an area less than 20Gs magnetic force. Therefore, a marked line for a "prohibited area" that more than 20Gs magnetic force was detected to exclude the metallic equipment parking. Another marked line for an alert area with magnetic force between 10-20 Gs, where the metallic equipment should be placed with great carefully. Also a "safety area" with less than 10Gs magnetic force was confirmed, where the metallic ventilator can be placed safety. After enter the 1.5T MRI room, the Servo 900C should be placed inside the safety frame initially, than process the power supply and setting up. On the other hand, traditional Servo 900C can't place even enter in the new 3T MRI room, according the instruction of 3T MRI operation, a certified MRI compatible ventilator (SERVO-i) is recommend for patients with respiratory failure, also a prohibited line with 200Gs should be marked. According to the instruction of operation of 3T MRI, a safety area beyond the prohibited line with less 200 Gs magnetic force may consider to be safety without sucked accident to place the SERVO-I (Figure 2). However, according to the operative guidelines of SERVO-1, an area with less than 50Gs should be considered complete safety for a patient under Servo-1 ventilation, thus whether a safety area to place the SERVO-I beyond the line of 200Gs or 50 Gs is depended on requirement of each MRI center.

**Conclusion:** When setting up a mechanical ventilator for a patient to perform the MRI study, be sure to obey the operative guidelines of MRI scanners. The marked line for a safety area and a safety frame to place the ventilators is very important to prevent the sucked accident for the metallic equipment. These lines may promote the patient safety for clinicians.

### Biography

Shu-Chen Hsing was born in Kaohsiung, Taiwan, R.O.C. She is a Master Graduate Institute of Department of Hospital and Health Care Administration Chia-Nan University of Pharmacy and Science Taiwan, R.O.C, She is a respiratory therapist at Chi Mei Medical Center respiratory department section chief.

rtlisa1022@yahoo.com.tw

### Notes: