AIR GUARD DECREASES THE PREVALENCE OF AIR/OXYGEN MISCONNECTIONS

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Abstract
Connecting the wrong gas to a patient who needs Oxygen is a serious and possibly tragic event. In 2006 there was an increase in the number of Air/Oxygen misconnection incidents reported to AIMS (Australian Incident Management System), at Flinders Medical Centre (FMC). As a result, FMC developed and introduced the “AirGuard”. The AirGuard is fitted to the outlet of an Air flow meter, and requires clinical staff to move a swing cover, before a hose can be connected to the flow meter. The use of the AirGuard, at reducing the prevalence of Air/Oxygen misconnection instances has shown to be successful in the two years since its introduction at Flinders Medical Centre.

Introduction
Incorrect gas delivery to patients, is a well recognised problem, and has received much attention in recent years.

At the point of delivery to patients, Oxygen and Medical Air are generally supplied via flow meters that are positioned side by side and have interchangeable connections (figure 1). This results in the possibility of a patient inadvertently being delivered Air, when they require Oxygen.

Solutions
Other institutions, who have investigated the problems of Air/Oxygen misconnections, have developed their own solutions. At the North Manchester General Hospital, high visibility signs (figure 2) have been used, to clearly identify and distinguish Air outlets from Oxygen outlets [1].

At Flinders Medical Centre, the AirGuard was developed and introduced in mid 2007, following an investigation into Air/Oxygen misconnection incidents in 2006. AirGuards provide both a visible difference between Air and Oxygen flow meters, and an operational difference. The “swing” of the AirGuard must be moved in order to connect tubing to the flow meter (figures 3 and 4).

Methods
The effectiveness of AirGuards, at reducing the risk of Air/Oxygen misconnections, was assessed by comparing the number of misconnection incidents reported to AIMS (Australian Incident Management System). Records of all reported misconnection incidents at Flinders Medical Centre, were kept for the two years prior to AirGuard introduction and for the two years following AirGuard introduction.

One misconnection incident was reported during the introduction phase for AirGuards. It could not be ascertained whether or not an AirGuard was fitted to the flow meter involved. Therefore this particular incident was excluded. All other reported incidents were included in the study.

Results
In the two years before AirGuards were introduced, there were twelve reported Air/Oxygen misconnection incidents. During the first two years of AirGuard service, three incidents have been reported. The numbers of reported incidents, on a month by month basis, are shown in figure 5.

The comparison of reported misconnection incidents before and after AirGuard introduction, indicates a significant reduction in incidents associated with AirGuard use.

The widespread use of AirGuards
To enable AirGuards to be used as widely as possible, they have been made to suit a number of flow meter brands (figure 6), and have been labeled and colour coded in accordance with the medical gas standards for multiple countries (figure 7).

With the ability to fit multiple flow meters and labeling to suit various countries, AirGuards are being trialed in medical facilities in Australia, UK, Canada and USA.

Conclusions
The risk of inadvertently connecting Medical Air to patients who require Oxygen, is an important issue confronting the biomedical community.

The use of aids to help differentiate Air flow meters from Oxygen flow meters may reduce the risk of misconnections occurring.

AirGuards provide both operational and visual differentiation between Air and Oxygen flow meters, and have been associated with a significant reduction in the number of Air/Oxygen misconnection incidents at Flinders Medical Centre.

The widespread use of AirGuards has now become possible with the ability to fit multiple flow meters and adhere to various labeling requirements.

References