

# What's New in the Patient Safety World

December 2014

## Oxygen Should Be AVOIDed

In several of our prior columns on use of oxygen (see our Patient Safety Tips of the Week April 8, 2008 "[Oxygen as a Medication](#)" and January 27, 2009 "[Oxygen Therapy: Everything You Wanted to Know and More!](#)") we have commented that in the past we often routinely gave oxygen to patients with myocardial infarction or stroke. But such use was more reflexive in nature and not evidence-based.

In our What's New in the Patient Safety World columns for July 2010 "[Cochrane Review: Oxygen in MI](#)" and February 2012 "[More Evidence of Harm from Oxygen](#)" we discussed the lack of evidence to support the routine use of oxygen in the acute MI patient and the possible deleterious effects in these and some other cardiac patients.

Then in our March 2014 What's New in the Patient Safety World column "[Another Strike Against Hyperoxia](#)" we noted a study showing that hyperoxia was independently associated with in-hospital death as compared with either normoxia or hypoxia in ventilated stroke patients admitted to ICU's.

Such studies have called for large randomized controlled trials to answer the important questions about if and when to use oxygen in patients with stroke or MI. One such study, The [Stroke Oxygen Study](#) (SO2S) in the UK, was recently completed in stroke patients (see our June 17, 2014 Patient Safety Tip of the Week "[SO2S Confirms Routine Oxygen of No Benefit in Stroke](#)") and showed no benefit of oxygen therapy in stroke patients who were not hypoxemic.

Now we finally also have the results of a randomized controlled trial of oxygen vs. no oxygen in patients with STEMI (S-T segment elevation myocardial infarction). Results of the Air Versus Oxygen in Myocardial Infarction (**AVOID**) study were just presented at the American Heart Association 2014 Scientific Sessions ([Stub 2014](#)). Patients with STEMI by EKG who had normal oxygen saturation were randomized in the pre-hospital transport system to receive either oxygen 8L/min or no supplemental oxygen. Those who received supplemental oxygen had larger infarct size by measurement of CPK (but not by troponin levels) and by cardiac MRI at 6 months. They also had a higher rate of recurrent myocardial infarction and an increase in frequency of cardiac arrhythmias. Mortality did not differ between the two groups but the study was not powered to demonstrate any difference in mortality. A much larger ongoing study in Sweden may be able to answer the question about impact on mortality. Thus the study showed supplemental oxygen

therapy in patients with STEMI but without hypoxia increased early myocardial injury and was associated with larger myocardial infarct size assessed at six months.

As we've recommended before, hospitals need to look at their existing protocols (and actual practices) for managing a variety of medical conditions where oxygen use may be considered. How many of you have **standardized order sets** that directly (or indirectly by poor use of checkboxes) encourage inappropriate use of oxygen in MI or stroke patients? Going back to our Patient Safety Tips of the Week April 8, 2008 "[Oxygen as a Medication](#)" and January 27, 2009 "[Oxygen Therapy: Everything You Wanted to Know and More!](#)" we strongly support facilities doing **audits** of their oxygen practices. You'll probably be surprised at the opportunities you uncover to improve practices (and save money at the same time!). And make sure your pre-hospital emergency response teams are aware of the results of the AVOID study.

### **Some of our prior columns on potential harmful effects of oxygen:**

April 8, 2008 "[Oxygen as a Medication](#)"

January 27, 2009 "[Oxygen Therapy: Everything You Wanted to Know and More!](#)"

July 2010 "[Cochrane Review: Oxygen in MI](#)"

February 2012 "[More Evidence of Harm from Oxygen](#)"

March 2014 "[Another Strike Against Hyperoxia](#)"

June 17, 2014 "[SO2S Confirms Routine O2 of No Benefit in Stroke](#)"

### **References:**

Stroke Oxygen Study website

<http://www.so2s.co.uk/>

Stub D, Smith K, Bernard, S, et al. A randomised controlled trial of oxygen therapy in acute ST-segment elevation myocardial infarction: The Air Versus Oxygen in Myocardial Infarction (AVOID) study. American Heart Association 2014 Scientific Sessions; November 19, 2014; Chicago, IL

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