Oxygen Supplementation in AMI is useful:  
Pro

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**Conflict of interest**

- I will try to use every possible trick to convince the audience

- For this reason, Information may be biased (or not)

- As always, the bottom line is yours

- Industry relationship: none
Giving Oxygen in AMI may raise death risk
Supplementary Oxygen in AMI: Pro

- What are we doing?
- Rationale
- Administration and dosing
- Benefit
- Secondary effects
- Guideline recommendation
Supplementary Oxygen in AMI: Pro

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O2 vs Air use in AMI
Online survey of Health Professionals´ practice and beliefs

UK emergency department, cardiology and ambulance staff.

• 98.3% always or usually use oxygen
• 80% have local guidelines recommending routine O2 use
• Only minor differences across specialities and grades

Supplementary Oxygen in AMI: Pro

Oxygen use in patients with Chest Pain in CCU
Results of a telephone survey across the United Kingdom

36% O2 by various flow rates and routes

30% O2 according to NICE guidelines (PsO2 target 94-98%)

34% routine use of high flow O2 with face mask & reservoir

231 Hospitals, October 2010

ECC, Paris, 2011
Supplementary Oxygen in AMI: **Pro**

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Supplementary Oxygen in AMI: \textit{Pro}

**ISCHEMIA AS AN IMBALANCE BETWEEN MYOCARDIAL OXYGEN SUPPLY AND DEMAND**

Oxygen

- SUPPLY
- DEMAND
Supplementary Oxygen in AMI: Pro

Frequency of Oxygen Desaturation in AMI

Nocturnal hypoxemia AMI, Killip I,

Constant Hypoxemia
12% of the patients

30% of patients
At least 1 episode of SpO2 < 80%

Galatius et al
Br Heart J 1994;72:23
Supplementary Oxygen in AMI: Pro

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Supplementary Oxygen in AMI: Pro

• What are you doing?
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Supplementary Oxygen in AMI: Pro

- Timing
- Route
- O2 Concentration

Hyperoxia

Supersaturated infusion

Hyperbaric
Supplementary Oxygen in AMI: *Pro*

- What are you doing?
- Rationale
- Administration and dosing
- Benefit, perceived & evidence based
- Secondary effects
- Guideline recommendation
Supplementary Oxygen in AMI: Pro

Benefit. Perceived:

• Reduces anxiety (of patients, nurses, paramedics, residents)

• We provide what is missing (ischemia = lack of O2)

• Patients feel better

• We are following the guidelines!

• Reduces mortality!

• And more …!
Supplementary Oxygen in AMI: Pro

O2 vs Air use in AMI
Online survey of Health Professionals´ practice and beliefs

UK emergency department, cardiology and ambulance staff.

• 55% believed O2 significantly reduces the risk of death

• 1.3% thought O2 may even increase the risk of death

• Only minor differences across specialities and grades

**Supplementary Oxygen in AMI: Pro**

**Benefit. Perceived:**

And more …

- Provides pure air (not always the case in EMDs)
- It is a relief when patient feels well and O2 is discontinued!
Supplementary Oxygen in AMI: Pro

Benefit. Evidence based:

**Hyperoxia. Mask or nasal prongs**
- Severe hypoxemia occurred less often. *J R Coll Physicians Lond.* 1997;31:657

**Supersaturated O2 coronary infusion**
- Reduction of infarct size. *Physiol* 2004; 287:H2234 (LAV);

**Hyperbaric O2**
- Improvement in ventricular function. *Am Heart J* 2004;148:e14
- Improvement of outcomes. *Bennett M. Cochrane colla. Libray,* 2008
Supplementary Oxygen in AMI: Pro

• What are you doing?
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Supplementary Oxygen in AML: Pro

Potential harm (not reported in AML)

- Increase coronary vascular resistance (1, 2)
- Increase heart rate (1)
- Decrease cardiac output (1)

- Hyperbaric: neurotoxic (3)

**Analysis 1.9. Comparison 1 Oxygen versus air, Outcome 9 Complications of AMI.**

**Review:** Oxygen therapy for acute myocardial infarction

**Comparison:** 1 Oxygen versus air

**Outcome:** 9 Complications of AMI

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>Experimental</th>
<th>Control</th>
<th>Risk Ratio</th>
<th>Weight</th>
<th>Risk Ratio</th>
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<tbody>
<tr>
<td></td>
<td>n/N</td>
<td>n/N</td>
<td>M-H,Fixed,95% CI</td>
<td></td>
<td>M-H,Fixed,95% CI</td>
</tr>
<tr>
<td>Ukholkina 2005</td>
<td>20/58</td>
<td>40/79</td>
<td></td>
<td>100.0 %</td>
<td>0.68 [ 0.45, 1.03 ]</td>
</tr>
<tr>
<td><strong>Total (95% CI)</strong></td>
<td><strong>58</strong></td>
<td><strong>79</strong></td>
<td></td>
<td>100.0 %</td>
<td>0.68 [ 0.45, 1.03 ]</td>
</tr>
</tbody>
</table>

Total events: 20 (Experimental), 40 (Control)
Heterogeneity: not applicable
Test for overall effect: Z = 1.81 (P = 0.070)

Ukholkina et al Kardiologiia 2005;45:59
Supplementary Oxygen in AMI: Pro

• What are we doing?
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### Table 4  Relief of pain, breathlessness, and anxiety

<table>
<thead>
<tr>
<th>Recommendations</th>
<th>Class^a</th>
<th>Level^b</th>
</tr>
</thead>
<tbody>
<tr>
<td>O(_2) (2–4 L/min) if breathlessness or other signs of heart failure</td>
<td>I</td>
<td>C</td>
</tr>
</tbody>
</table>

Non invasive monitoring of blood O\(_2\) saturation is of great help on deciding on the need of O\(_2\) administration (mask or nasal prongs)
### Table 15  Treatment of pump failure and cardiogenic shock

<table>
<thead>
<tr>
<th>Recommendations</th>
<th>Class</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment of mild heart failure (Killip class II)</td>
<td>I</td>
<td>C</td>
</tr>
<tr>
<td>( O_2 )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment of severe heart failure (Killip class III)</td>
<td>I</td>
<td>C</td>
</tr>
<tr>
<td>( O_2 )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment of shock (Killip class IV)</td>
<td>I</td>
<td>C</td>
</tr>
<tr>
<td>( O_2 )</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Supplementary Oxygen in AMI: Pro

CLASS IIa 2011

1. It is reasonable to administer supplemental oxygen to all patients with UA/NSTEMI during the first 6 h after presentation. (Level of Evidence: C)

Class IIa 2004, 2007, 2009

It is reasonable to administer supplemental oxygen to all patients with uncomplicated STEMI during the first 6 hours. (Level of Evidence: C)
Supplementary Oxygen in AMI: Pro

- Offer supplementary Oxygen if SpO2 less than 94%
- In AMI and ACS, aim at an oxygen saturation of 94 to 98%

- By nasal cannula: 2 - 6 l/min
- By simple face mask: 5 - 10 l/min

British Thoracic Society 2008
National Institute for Health and Clinical Excellence NICE 2010
NICE www.nice.org.uk
HEART 2010;96:974
Oxygen Supplementation in AMI is useful: Yes

but…
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but...

Dr Lotan has another opinion