



Hypoxaemia on the first day following major non-orthopaedic surgery is associated with a higher risk of postoperative pneumonia, ICU re/admission, reintubation, and death.

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Background:

Hypoxaemia following major surgery is common¹. The relationship between hypoxaemia on the first postoperative day and clinical outcomes is uncertain.

Objective:

To measure the association between hypoxaemia on the first postoperative day with pneumonia (day 2-7), reintubation, ICU re/admission and death following surgery.

Methods:

Patient-level data evaluated from CHESTY: an international multi-centre prospective observational cohort study.

34 centres 5 countries

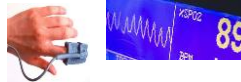


4431 adults

Major surgery
Abdominal
Cardiac
Thoracic
Neuro/Spinal/ENT

Hypoxaemia

postop day 1 =
SpO2 <90% on air
or P/F <300



Outcomes:

Pneumonia ICU re/admission



Reintubation

Mortality



The association between hypoxaemia and postoperative outcomes was analysed using logistic regression, adjusted for significant univariate predictors of each outcome.

Table 1: Baseline characteristics

Characteristic	Not Hypoxaemic n(%) N = 3041	Hypoxaemic n (%) N = 1390
Age mean (SD)	61 (16)	64 (14)
Male	1732 (57)	907 (65)
BMI median (IQR)	27 (23-31)	28 (25-33)
Smoker	1365 (45)	728 (52)
ASA >2	1540 (50)	1037 (77)
Surgery type		
Abdominal	1936 (64)	607 (43)
Cardiac	342 (11)	506 (36)
Thoracic	181 (6)	85(6)
Neuro/Spinal/ENT	414 (14)	108 (8)
Emergency surgery	527 (17)	372 (27)
Open incision	2202 (72)	1200 (86)
OT >3 hours	2120 (70)	1106 (79)
Postop ICU	1224 (40)	1115 (80)
Mechanical ventilation day 1	203 (7)	537 (39)

*Between group differences p <0.05 for all variables

Results:

Those with hypoxaemia on the first postoperative day had an increased likelihood of developing pneumonia, being reintubated, ICU re/admission and in-hospital mortality compared to those without hypoxaemia. (Table 2)

Table 2: Association between hypoxaemia on the first post-operative day and outcomes

Outcome	Odds ratio	95% CI	p
Pneumonia day 2-7	2.25	[1.63 - 3.10]	<0.001
Reintubation	1.59	[1.06 - 2.39]	0.025
ICU re/admission	2.01	[1.46 - 2.78]	<0.001
In hospital mortality	2.29	[1.41 - 3.69]	0.001

Multiple logistic regression adjusted for significant univariate predictors of each outcome.

Conclusion:

Day 1 hypoxaemia is independently associated with serious adverse outcomes. Whether treatment of postoperative hypoxaemia prevents subsequent complications requires further study.

