**Supplemental Material 1**

**Search strategy – PICO**

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| **P**  **(In the…)** | **I**  **(Does treatment with…)** | **C**  **(Compared with….)** | **O**  **(Increase/decrease)** |
| 1.  Peri-operative (pre-, intra-, postoperative) hypoxaemic adult | High flow nasal cannula | Conventional oxygen therapy | Mortality, duration of stay in ICU and hospital, rate of post-extubation failure, rate of hospital-acquired pneumonia |
| 2.  Peri-operative (pre-, intra-, postoperative) hypoxaemic adult | High flow nasal cannula | Oxygen therapy | Mortality, duration of stay in ICU and hospital, rate of post-extubation failure, rate of hospital-acquired pneumonia |
| 3.  Peri-operative (pre-, intra-, postoperative) hypoxaemic adult | High flow nasal cannula | Continuous positive airway pressure | Mortality, duration of stay in ICU and hospital, rate of post-extubation failure, rate of hospital-acquired pneumonia |
| 4.  Peri-operative (pre-, intra-, postoperative) hypoxaemic adult | High flow nasal cannula | Bilevel positive airway pressure | Mortality, duration of stay in ICU and hospital, rate of post-extubation failure, rate of hospital-acquired pneumonia |
| 5.  Peri-operative (pre-, intra-, postoperative) hypoxaemic adult | High flow nasal cannula | Non invasive ventilation | Mortality, duration of stay in ICU and hospital, rate of post-extubation failure, rate of hospital-acquired pneumonia |

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| **P**  **(In the…)** | **I**  **(Does treatment with…)** | **C**  **(Compared with….)** | **O**  **(Increase/decrease)** |
| 6.  Peri-operative (pre-, intra-, postoperative) hypoxaemic adult | Non invasive ventilation | Conventional oxygen therapy | Mortality, duration of stay in ICU and hospital, rate of post-extubation failure, rate of hospital-acquired pneumonia |
| 7.  Peri-operative (pre-, intra-, postoperative) hypoxaemic adult | Non invasive ventilation | Oxygen therapy | Mortality, duration of stay in ICU and hospital, rate of post-extubation failure, rate of hospital-acquired pneumonia |
| 8.  Peri-operative (pre-, intra-, postoperative) hypoxaemic adult | Non invasive ventilation | Continuous positive airway pressure | Mortality, duration of stay in ICU and hospital, rate of post-extubation failure, rate of hospital-acquired pneumonia |
| 9.  Peri-operative (pre-, intra-, postoperative) hypoxaemic adult | Non invasive ventilation | Bilevel positive airway pressure | Mortality, duration of stay in ICU and hospital, rate of post-extubation failure, rate of hospital-acquired pneumonia |

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| **P**  **(In the…)** | **I**  **(Does treatment with…)** | **C**  **(Compared with….)** | **O**  **(Increase/decrease)** |
| 10.  Hypoxaemic adult undergoing bronchoscopy | High flow nasal cannula | Conventional oxygen therapy | Mortality, duration of stay in ICU and hospital, rate of post-extubation failure, rate of hospital-acquired pneumonia |
| 11.  Hypoxaemic adult undergoing bronchoscopy | High flow nasal cannula | Oxygen therapy | Mortality, duration of stay in ICU and hospital, rate of post-extubation failure, rate of hospital-acquired pneumonia |
| 12.  Hypoxaemic adult undergoing bronchoscopy | High flow nasal cannula | Continuous positive airway pressure | Mortality, duration of stay in ICU and hospital, rate of post-extubation failure, rate of hospital-acquired pneumonia |
| 13.  Hypoxaemic adult undergoing bronchoscopy | High flow nasal cannula | Bilevel positive airway pressure | Mortality, duration of stay in ICU and hospital, rate of post-extubation failure, rate of hospital-acquired pneumonia |
| 14.  Hypoxaemic adult undergoing bronchoscopy | High flow nasal cannula | Non invasive ventilation | Mortality, duration of stay in ICU and hospital, rate of post-extubation failure, rate of hospital-acquired pneumonia |

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| **P**  **(In the…)** | **I**  **(Does treatment with…)** | **C**  **(Compared with….)** | **O**  **(Increase/decrease)** |
| 15.  Hypoxaemic adult undergoing bronchoscopy | Non invasive ventilation | Conventional oxygen therapy | Mortality, duration of stay in ICU and hospital, rate of post-extubation failure, rate of hospital-acquired pneumonia |
| 16.  Hypoxaemic adult undergoing bronchoscopy | Non invasive ventilation | Oxygen therapy | Mortality, duration of stay in ICU and hospital, rate of post-extubation failure, rate of hospital-acquired pneumonia |
| 17.  Hypoxaemic adult undergoing bronchoscopy | Non invasive ventilation | Continuous positive airway pressure | Mortality, duration of stay in ICU and hospital, rate of post-extubation failure, rate of hospital-acquired pneumonia |
| 18.  Hypoxaemic adult undergoing bronchoscopy | Non invasive ventilation | Bilevel positive airway pressure | Mortality, duration of stay in ICU and hospital, rate of post-extubation failure, rate of hospital-acquired pneumonia |

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| **P**  **(In the…)** | **I**  **(Does treatment with…)** | **C**  **(Compared with….)** | **O**  **(Increase/decrease)** |
| 19.  Hypoxaemic adult undergoing procedure under sedation | High flow nasal cannula | Conventional oxygen therapy | Mortality, duration of stay in ICU and hospital, rate of post-extubation failure, rate of hospital-acquired pneumonia |
| 20.  Hypoxaemic adult undergoing procedure under sedation | High flow nasal cannula | Oxygen therapy | Mortality, duration of stay in ICU and hospital, rate of post-extubation failure, rate of hospital-acquired pneumonia |
| 21.  Hypoxaemic adult undergoing procedure under sedation | High flow nasal cannula | Continuous positive airway pressure | Mortality, duration of stay in ICU and hospital, rate of post-extubation failure, rate of hospital-acquired pneumonia |
| 22.  Hypoxaemic adult undergoing procedure under sedation | High flow nasal cannula | Bilevel positive airway pressure | Mortality, duration of stay in ICU and hospital, rate of post-extubation failure, rate of hospital-acquired pneumonia |
| 23.  Hypoxaemic adult undergoing procedure under sedation | High flow nasal cannula | Non invasive ventilation | Mortality, duration of stay in ICU and hospital, rate of post-extubation failure, rate of hospital-acquired pneumonia |

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| **P**  **(In the…)** | **I**  **(Does treatment with…)** | **C**  **(Compared with….)** | **O**  **(Increase/decrease)** |
| 24.  Hypoxaemic adult undergoing procedure under sedation | Non invasive ventilation | Conventional oxygen therapy | Mortality, duration of stay in ICU and hospital, rate of post-extubation failure, rate of hospital-acquired pneumonia |
| 25.  Hypoxaemic adult undergoing procedure under sedation | Non invasive ventilation | Oxygen therapy | Mortality, duration of stay in ICU and hospital, rate of post-extubation failure, rate of hospital-acquired pneumonia |
| 26.  Hypoxaemic adult undergoing procedure under sedation | Non invasive ventilation | Continuous positive airway pressure | Mortality, duration of stay in ICU and hospital, rate of post-extubation failure, rate of hospital-acquired pneumonia |
| 27.  Hypoxaemic adult undergoing procedure under sedation | Non invasive ventilation | Bilevel positive airway pressure | Mortality, duration of stay in ICU and hospital, rate of post-extubation failure, rate of hospital-acquired pneumonia |

**Search strategy – Key words**

## Search 1

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| Medline  1 exp Hypoxia/ or exp Respiratory Insufficiency/ or (hypox?em\* or hypoxia or hypoxic or Anoxia or anox?emi\* or hypoxidosis or ((breathing or ventilat\* or respirat\* or oxygen) adj6 (insufficien\* or deficien\* or fail\* or distress\* or depress\* or support\*))).ti,ab,hw,kw. or Critical Illness/ or Critical Care/ or exp Intensive Care Units/ or (ICU or ((intensive or critical) adj3 (care or unit\*)) or (critical\* adj3 ill\*)).ti,ab,hw,kw. (504501)  2 (((highflow or high flow or high frequency) adj6 (oxygen\* or O2 or can?ula\* or prong\* or nasal or nose)) or ((oxygen\* or O2\*) adj6 (can?ula\* or prong\* or nasal or catheter\*)) or (nasal adj6 can?ula\*) or THRIVE or (Transnasal adj6 ventilatory exchange) or HFNC or HFNP or Optiflow or Vapotherm or Comfort Flo).ti,ab,hw,kw. (13814)  3 exp Oxygen Inhalation Therapy/ or (((oxygen\* or O2\*) adj5 (treat\* or therap\*)) or COT).ti,ab,hw,kw. (41693)  4 1 and 2 and 3 (855)  5 exp Animals/ not Humans/ (4428087)  6 4 not 5 (834)  7 (exp child/ or exp Infant/) not exp adult/ (1537163)  8 6 not 7 (604) | Embase  1 exp Hypoxia/ or exp respiratory failure/ or (hypox?em\* or hypoxia or hypoxic or Anoxia or anox?emi\* or hypoxidosis or ((breathing or ventilat\* or respirat\* or oxygen) adj6 (insufficien\* or deficien\* or fail\* or distress\* or depress\* or support\*))).ti,ab,hw,kw. or Critical Illness/ or exp intensive care/ or exp Intensive Care Unit/ or (ICU or ((intensive or critical) adj3 (care or unit\*)) or (critical\* adj3 ill\*)).ti,ab,hw,kw. (1138979)  2 oxygen nasal cannula/ or (((highflow or high flow or high frequency) adj6 (oxygen\* or O2 or can?ula\* or prong\* or nasal or nose)) or ((oxygen\* or O2\*) adj6 (can?ula\* or prong\* or nasal or catheter\*)) or (nasal adj6 can?ula\*) or THRIVE or (Transnasal adj6 ventilatory exchange) or HFNC or HFNP or Optiflow or Vapotherm or Comfort Flo).ti,ab,hw,kw. (23814)  3 exp Oxygen Therapy/ or (((oxygen\* or O2\*) adj5 (treat\* or therap\*)) or COT).ti,ab,hw,kw. (56158)  4 1 and 2 and 3 (1735)  5 exp animal/ not exp human/ (4647289)  6 4 not 5 (1705)  7 exp child/ not exp adult/ (1840712)  8 6 not 7 (1281) |
| Central  #1 MeSH descriptor: [Hypoxia] explode all trees 1473 #2 MeSH descriptor: [Respiratory Insufficiency] explode all trees 2061 #3 MeSH descriptor: [Critical Illness] explode all trees 1632 #4 MeSH descriptor: [Critical Care] explode all trees 2219 #5 MeSH descriptor: [Intensive Care Units] explode all trees 3520 #6 (hypox\*em\* or hypoxia or hypoxic or Anoxia or anox\*emi\* or hypoxidosis or ((breathing or ventilat\* or respirat\* or oxygen) near/6 (insufficien\* or deficien\* or fail\* or distress\* or depress\* or support\*)) or ICU or ((intensive or critical) near/3 (care or unit\*)) or (critical\* near/3 ill\*)) 54169 #7 #1 or #2 or #3 or #4 or #5 or #6 55299 #8 ((highflow or high flow or high frequency) near/6 (oxygen\* or O2 or can\*ula\* or prong\* or nasal or nose)) or ((oxygen\* or O2\*) near/6 (can\*ula\* or prong\* or nasal or catheter\*)) or (nasal near/6 can\*ula\*) or THRIVE or (Transnasal near/6 ventilatory exchange) or HFNC or HFNP or Optiflow or Vapotherm or Comfort Flo 1652 #9 MeSH descriptor: [Oxygen Inhalation Therapy] explode all trees 1481 #10 ((oxygen\* or O2\*) near/5 (treat\* or therap\*)) or COT 7557 #11 #9 or #10 7626 #12 #7 and #8 and #11 476 #13 #12 not ((paediatric\* or pediatric\* or child\* or infant\*) not (adult\* or aged or elderly)) in Trials 295 | Cinahl  S1 (MH "Anoxia+") or (MH "Respiratory Failure+") or (MH "Critical Illness") or (MH "Critical Care+") or (MH "Intensive Care Units+") or TX ((hypox\*em\* or hypoxia or hypoxic or Anoxia or anox\*emi\* or hypoxidosis or ((breathing or ventilat\* or respirat\* or oxygen) N6 (insufficien\* or deficien\* or fail\* or distress\* or depress\* or support\*))) or (ICU or ((intensive or critical) N3 (care or unit\*)) or (critical\* N3 ill\*)))  176,065  S2 TX (((highflow or high flow or high frequency) N6 (oxygen\* or O2 or can\*ula\* or prong\* or nasal or nose)) or ((oxygen\* or O2\*) N6 (can\*ula\* or prong\* or nasal or catheter\*)) or (nasal N6 can\*ula\*) or THRIVE or (Transnasal N6 ventilatory exchange) or HFNC or HFNP or Optiflow or Vapotherm or Comfort Flo)  3,439  S3 (MH "Oxygen Therapy+") or TX (((oxygen\* or O2\*) N5 (treat\* or therap\*)) or COT)  8,734  S4 S1 AND S2 AND S3  356  S5 (MH "Animals+") not (MH "Human")  34,468  S6 S4 not S5  354  S7 (MH "Child+") not (MH "Adult+")  275,394  S8 S6 not S7  262 |

## Search 2

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| Medline  1 exp Hypoxia/ or exp Respiratory Insufficiency/ or (hypox?em\* or hypoxia or hypoxic or Anoxia or anox?emi\* or hypoxidosis or ((breathing or ventilat\* or respirat\* or oxygen) adj6 (insufficien\* or deficien\* or fail\* or distress\* or depress\* or support\*))).ti,ab,hw,kw. or Critical Illness/ or Critical Care/ or exp Intensive Care Units/ or (ICU or ((intensive or critical) adj3 (care or unit\*)) or (critical\* adj3 ill\*)).ti,ab,hw,kw. (504501)  2 (((highflow or high flow or high frequency) adj6 (oxygen\* or O2 or can?ula\* or prong\* or nasal or nose)) or ((oxygen\* or O2\*) adj6 (can?ula\* or prong\* or nasal or catheter\*)) or (nasal adj6 can?ula\*) or THRIVE or (Transnasal adj6 ventilatory exchange) or HFNC or HFNP or Optiflow or Vapotherm or Comfort Flo).ti,ab,hw,kw. (13814)  3 exp Positive-Pressure Respiration/ or exp Continuous Positive Airway Pressure/ or ((positive adj3 airway adj3 pressure\*) or ((positive or airway) adj3 pressure adj3 (respirat\* or ventilat\*)) or (positive adj3 expiratory adj3 pressure\*) or CPAP or nCPAP or BiPAP).ti,ab,hw,kw. (32626)  4 1 and 2 and 3 (575)  5 exp Animals/ not Humans/ (4428087)  6 4 not 5 (564)  7 (exp child/ or exp Infant/) not exp adult/ (1537163)  8 6 not 7 (303) | Embase  1 exp Hypoxia/ or exp respiratory failure/ or (hypox?em\* or hypoxia or hypoxic or Anoxia or anox?emi\* or hypoxidosis or ((breathing or ventilat\* or respirat\* or oxygen) adj6 (insufficien\* or deficien\* or fail\* or distress\* or depress\* or support\*))).ti,ab,hw,kw. or Critical Illness/ or exp intensive care/ or exp Intensive Care Unit/ or (ICU or ((intensive or critical) adj3 (care or unit\*)) or (critical\* adj3 ill\*)).ti,ab,hw,kw. (1138979)  2 oxygen nasal cannula/ or (((highflow or high flow or high frequency) adj6 (oxygen\* or O2 or can?ula\* or prong\* or nasal or nose)) or ((oxygen\* or O2\*) adj6 (can?ula\* or prong\* or nasal or catheter\*)) or (nasal adj6 can?ula\*) or THRIVE or (Transnasal adj6 ventilatory exchange) or HFNC or HFNP or Optiflow or Vapotherm or Comfort Flo).ti,ab,hw,kw. (23814)  3 positive end expiratory pressure/ or ((positive adj3 airway adj3 pressure\*) or ((positive or airway) adj3 pressure adj3 (respirat\* or ventilat\*)) or (positive adj3 expiratory adj3 pressure\*) or CPAP or nCPAP or BiPAP).ti,ab,hw,kw. (57431)  4 1 and 2 and 3 (1743)  5 exp animal/ not exp human/ (4647289)  6 4 not 5 (1720)  7 exp child/ not exp adult/ (1840712)  8 6 not 7 (983) |
| Central#1 MeSH descriptor: [Hypoxia] explode all trees 1473 #2 MeSH descriptor: [Respiratory Insufficiency] explode all trees 2061 #3 MeSH descriptor: [Critical Illness] explode all trees 1632 #4 MeSH descriptor: [Critical Care] explode all trees 2219 #5 MeSH descriptor: [Intensive Care Units] explode all trees 3520 #6 (hypox\*em\* or hypoxia or hypoxic or Anoxia or anox\*emi\* or hypoxidosis or ((breathing or ventilat\* or respirat\* or oxygen) near/6 (insufficien\* or deficien\* or fail\* or distress\* or depress\* or support\*)) or ICU or ((intensive or critical) near/3 (care or unit\*)) or (critical\* near/3 ill\*)) 54166 #7 #1 or #2 or #3 or #4 or #5 or #6 55296 #8 ((highflow or high flow or high frequency) near/6 (oxygen\* or O2 or can\*ula\* or prong\* or nasal or nose)) or ((oxygen\* or O2\*) near/6 (can\*ula\* or prong\* or nasal or catheter\*)) or (nasal near/6 can\*ula\*) or THRIVE or (Transnasal near/6 ventilatory exchange) or HFNC or HFNP or Optiflow or Vapotherm or Comfort Flo 1651 #9 MeSH descriptor: [Positive-Pressure Respiration] explode all trees 2574 #10 MeSH descriptor: [Continuous Positive Airway Pressure] explode all trees 992 #11 (positive near/3 airway near/3 pressure\*) or ((positive or airway) near/3 pressure near/3 (respirat\* or ventilat\*)) or (positive near/3 expiratory near/3 pressure\*) or CPAP or nCPAP or BiPAP 6914 #12 #9 or #10 or #11 6937 #13 #7 and #8 and #12 335 #14 #13 not ((paediatric\* or pediatric\* or child\* or infant\*) not (adult\* or aged or elderly)) in Trials 101 | Cinahl  S1 (MH "Anoxia+") or (MH "Respiratory Failure+") or (MH "Critical Illness") or (MH "Critical Care+") or (MH "Intensive Care Units+") or TX ((hypox\*em\* or hypoxia or hypoxic or Anoxia or anox\*emi\* or hypoxidosis or ((breathing or ventilat\* or respirat\* or oxygen) N6 (insufficien\* or deficien\* or fail\* or distress\* or depress\* or support\*))) or (ICU or ((intensive or critical) N3 (care or unit\*)) or (critical\* N3 ill\*)))  1765,065  S2 TX (((highflow or high flow or high frequency) N6 (oxygen\* or O2 or can\*ula\* or prong\* or nasal or nose)) or ((oxygen\* or O2\*) N6 (can\*ula\* or prong\* or nasal or catheter\*)) or (nasal N6 can\*ula\*) or THRIVE or (Transnasal N6 ventilatory exchange) or HFNC or HFNP or Optiflow or Vapotherm or Comfort Flo)  3,439  S3 (MH "Continuous Positive Airway Pressure") OR (MH "Positive Pressure Ventilation+") OR (MH "Positive End-Expiratory Pressure") or TX ((positive N3 airway N3 pressure\*) or ((positive or airway) N3 pressure N3 (respirat\* or ventilat\*)) or (positive N3 expiratory N3 pressure\*) or CPAP or nCPAP or BiPAP)  7,473  S4 S1 AND S2 AND S3  239  S5 (MH "Animals+") not (MH "Human")  34,468  S6 S4 not S5  239  S7 (MH "Child+") not (MH "Adult+")  275,394  S8 S6 not S7  111 |

## Search 3

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| Medline  1 exp Hypoxia/ or exp Respiratory Insufficiency/ or (hypox?em\* or hypoxia or hypoxic or Anoxia or anox?emi\* or hypoxidosis or ((breathing or ventilat\* or respirat\* or oxygen) adj6 (insufficien\* or deficien\* or fail\* or distress\* or depress\* or support\*))).ti,ab,hw,kw. or Critical Illness/ or Critical Care/ or exp Intensive Care Units/ or (ICU or ((intensive or critical) adj3 (care or unit\*)) or (critical\* adj3 ill\*)).ti,ab,hw,kw. (504501)  2 (((highflow or high flow or high frequency) adj6 (oxygen\* or O2 or can?ula\* or prong\* or nasal or nose)) or ((oxygen\* or O2\*) adj6 (can?ula\* or prong\* or nasal or catheter\*)) or (nasal adj6 can?ula\*) or THRIVE or (Transnasal adj6 ventilatory exchange) or HFNC or HFNP or Optiflow or Vapotherm or Comfort Flo).ti,ab,hw,kw. (13814)  3 exp Noninvasive Ventilation/ or (((non invasive or noninvasive) adj6 (ventilat\* or respirat\*)) or NIV).ti,ab,hw,kw. (8394)  4 1 and 2 and 3 (358)  5 exp Animals/ not Humans/ (4428087)  6 4 not 5 (358)  7 (exp child/ or exp Infant/) not exp adult/ (1537163)  8 6 not 7 (245) | Embase  1 exp Hypoxia/ or exp respiratory failure/ or (hypox?em\* or hypoxia or hypoxic or Anoxia or anox?emi\* or hypoxidosis or ((breathing or ventilat\* or respirat\* or oxygen) adj6 (insufficien\* or deficien\* or fail\* or distress\* or depress\* or support\*))).ti,ab,hw,kw. or Critical Illness/ or exp intensive care/ or exp Intensive Care Unit/ or (ICU or ((intensive or critical) adj3 (care or unit\*)) or (critical\* adj3 ill\*)).ti,ab,hw,kw. (1138979)  2 oxygen nasal cannula/ or (((highflow or high flow or high frequency) adj6 (oxygen\* or O2 or can?ula\* or prong\* or nasal or nose)) or ((oxygen\* or O2\*) adj6 (can?ula\* or prong\* or nasal or catheter\*)) or (nasal adj6 can?ula\*) or THRIVE or (Transnasal adj6 ventilatory exchange) or HFNC or HFNP or Optiflow or Vapotherm or Comfort Flo).ti,ab,hw,kw. (23814)  3 noninvasive ventilation/ or (((non invasive or noninvasive) adj6 (ventilat\* or respirat\*)) or NIV).ti,ab,hw,kw. (16457)  4 1 and 2 and 3 (994)  5 exp animal/ not exp human/ (4647289)  6 4 not 5 (985)  7 exp child/ not exp adult/ (1840712)  8 6 not 7 (666) |
| Central  #1 MeSH descriptor: [Hypoxia] explode all trees 1473 #2 MeSH descriptor: [Respiratory Insufficiency] explode all trees 2061 #3 MeSH descriptor: [Critical Illness] explode all trees 1632 #4 MeSH descriptor: [Critical Care] explode all trees 2219 #5 MeSH descriptor: [Intensive Care Units] explode all trees 3520 #6 (hypox\*em\* or hypoxia or hypoxic or Anoxia or anox\*emi\* or hypoxidosis or ((breathing or ventilat\* or respirat\* or oxygen) near/6 (insufficien\* or deficien\* or fail\* or distress\* or depress\* or support\*)) or ICU or ((intensive or critical) near/3 (care or unit\*)) or (critical\* near/3 ill\*)) 54169 #7 #1 or #2 or #3 or #4 or #5 or #6 55299 #8 ((highflow or high flow or high frequency) near/6 (oxygen\* or O2 or can\*ula\* or prong\* or nasal or nose)) or ((oxygen\* or O2\*) near/6 (can\*ula\* or prong\* or nasal or catheter\*)) or (nasal near/6 can\*ula\*) or THRIVE or (Transnasal near/6 ventilatory exchange) or HFNC or HFNP or Optiflow or Vapotherm or Comfort Flo 1652 #9 MeSH descriptor: [Noninvasive Ventilation] explode all trees 150 #10 ((non invasive or noninvasive) near/6 (ventilat\* or respirat\*)) or NIV 1956 #11 #9 or #10 1956 #12 #7 and #8 and #11 208 #13 #12 not ((paediatric\* or pediatric\* or child\* or infant\*) not (adult\* or aged or elderly)) in Trials 111 | Cinahl    S1 (MH "Anoxia+") or (MH "Respiratory Failure+") or (MH "Critical Illness") or (MH "Critical Care+") or (MH "Intensive Care Units+") or TX ((hypox\*em\* or hypoxia or hypoxic or Anoxia or anox\*emi\* or hypoxidosis or ((breathing or ventilat\* or respirat\* or oxygen) N6 (insufficien\* or deficien\* or fail\* or distress\* or depress\* or support\*))) or (ICU or ((intensive or critical) N3 (care or unit\*)) or (critical\* N3 ill\*)))  176,095  S2 TX (((highflow or high flow or high frequency) N6 (oxygen\* or O2 or can\*ula\* or prong\* or nasal or nose)) or ((oxygen\* or O2\*) N6 (can\*ula\* or prong\* or nasal or catheter\*)) or (nasal N6 can\*ula\*) or THRIVE or (Transnasal N6 ventilatory exchange) or HFNC or HFNP or Optiflow or Vapotherm or Comfort Flo)  3,439  S3 TX (((non invasive or noninvasive) N6 (ventilat\* or respirat\*)) or NIV)  2,208  S4 S1 AND S2 AND S3  127  S5 (MH "Animals+") not (MH "Human")  34,468  S6 S4 not S5  127  S7 (MH "Child+") not (MH "Adult+")  275,394  S8 S6 not S7  81 |

## Search 4

|  |  |
| --- | --- |
| Medline  1 exp Hypoxia/ or exp Respiratory Insufficiency/ or (hypox?em\* or hypoxia or hypoxic or Anoxia or anox?emi\* or hypoxidosis or ((breathing or ventilat\* or respirat\* or oxygen) adj6 (insufficien\* or deficien\* or fail\* or distress\* or depress\* or support\*))).ti,ab,hw,kw. or Critical Illness/ or Critical Care/ or exp Intensive Care Units/ or (ICU or ((intensive or critical) adj3 (care or unit\*)) or (critical\* adj3 ill\*)).ti,ab,hw,kw. (504501)  2 exp Noninvasive Ventilation/ or (((non invasive or noninvasive) adj6 (ventilat\* or respirat\*)) or NIV).ti,ab,hw,kw. (8394)  3 exp Oxygen Inhalation Therapy/ or (((oxygen\* or O2\*) adj5 (treat\* or therap\*)) or COT).ti,ab,hw,kw. (41693)  4 1 and 2 and 3 (613)  5 exp Animals/ not Humans/ (4428087)  6 4 not 5 (613)  7 (exp child/ or exp Infant/) not exp adult/ (1537163)  8 6 not 7 (528) | Embase  1 exp Hypoxia/ or exp respiratory failure/ or (hypox?em\* or hypoxia or hypoxic or Anoxia or anox?emi\* or hypoxidosis or ((breathing or ventilat\* or respirat\* or oxygen) adj6 (insufficien\* or deficien\* or fail\* or distress\* or depress\* or support\*))).ti,ab,hw,kw. or Critical Illness/ or exp intensive care/ or exp Intensive Care Unit/ or (ICU or ((intensive or critical) adj3 (care or unit\*)) or (critical\* adj3 ill\*)).ti,ab,hw,kw. (1138979)  2 noninvasive ventilation/ or (((non invasive or noninvasive) adj6 (ventilat\* or respirat\*)) or NIV).ti,ab,hw,kw. (16457)  3 exp Oxygen Therapy/ or (((oxygen\* or O2\*) adj5 (treat\* or therap\*)) or COT).ti,ab,hw,kw. (56158)  4 1 and 2 and 3 (1775)  5 exp animal/ not exp human/ (4647289)  6 4 not 5 (1770)  7 exp child/ not exp adult/ (1840712)  8 6 not 7 (1578) |
| Central  #1 MeSH descriptor: [Hypoxia] explode all trees 1473  #2 MeSH descriptor: [Respiratory Insufficiency] explode all trees 2061  #3 MeSH descriptor: [Critical Illness] explode all trees 1632  #4 MeSH descriptor: [Critical Care] explode all trees 2219  #5 MeSH descriptor: [Intensive Care Units] explode all trees 3520  #6 (hypox\*em\* or hypoxia or hypoxic or Anoxia or anox\*emi\* or hypoxidosis or ((breathing or ventilat\* or respirat\* or oxygen) near/6 (insufficien\* or deficien\* or fail\* or distress\* or depress\* or support\*)) or ICU or ((intensive or critical) near/3 (care or unit\*)) or (critical\* near/3 ill\*)) 54169  #7 #1 or #2 or #3 or #4 or #5 or #6 55299  #8 MeSH descriptor: [Noninvasive Ventilation] explode all trees 150  #9 ((non invasive or noninvasive) near/6 (ventilat\* or respirat\*)) or NIV 1956  #10 #8 or #9 1956  #11 MeSH descriptor: [Oxygen Inhalation Therapy] explode all trees 1481  #12 ((oxygen\* or O2\*) near/5 (treat\* or therap\*)) or COT 7557  #13 #11 or #12 7626  #14 #7 and #10 and #13 359  #15 #14 not ((paediatric\* or pediatric\* or child\* or infant\*) not (adult\* or aged or elderly)) in Trials 226 | Cinahl  S1 (MH "Anoxia+") or (MH "Respiratory Failure+") or (MH "Critical Illness") or (MH "Critical Care+") or (MH "Intensive Care Units+") or TX ((hypox\*em\* or hypoxia or hypoxic or Anoxia or anox\*emi\* or hypoxidosis or ((breathing or ventilat\* or respirat\* or oxygen) N6 (insufficien\* or deficien\* or fail\* or distress\* or depress\* or support\*))) or (ICU or ((intensive or critical) N3 (care or unit\*)) or (critical\* N3 ill\*)))  176,095  S2 TX (((non invasive or noninvasive) N6 (ventilat\* or respirat\*)) or NIV)  2,208  S3 (MH "Oxygen Therapy+") or TX (((oxygen\* or O2\*) N5 (treat\* or therap\*)) or COT)  8,734  S4 S1 AND S2 AND S3  210  S5 (MH "Animals+") not (MH "Human")  34,468  S6 S4 not S5  209  S7 (MH "Child+") not (MH "Adult+")  275,437  S8 S6 not S7  182 |

## Search 5

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| Medline  1 exp Hypoxia/ or exp Respiratory Insufficiency/ or (hypox?em\* or hypoxia or hypoxic or Anoxia or anox?emi\* or hypoxidosis or ((breathing or ventilat\* or respirat\* or oxygen) adj6 (insufficien\* or deficien\* or fail\* or distress\* or depress\* or support\*))).ti,ab,hw,kw. or Critical Illness/ or Critical Care/ or exp Intensive Care Units/ or (ICU or ((intensive or critical) adj3 (care or unit\*)) or (critical\* adj3 ill\*)).ti,ab,hw,kw. (504501)  2 exp Noninvasive Ventilation/ or (((non invasive or noninvasive) adj6 (ventilat\* or respirat\*)) or NIV).ti,ab,hw,kw. (8394)  3 exp Positive-Pressure Respiration/ or exp Continuous Positive Airway Pressure/ or ((positive adj3 airway adj3 pressure\*) or ((positive or airway) adj3 pressure adj3 (respirat\* or ventilat\*)) or (positive adj3 expiratory adj3 pressure\*) or CPAP or nCPAP or BiPAP).ti,ab,hw,kw. (32626)  4 1 and 2 and 3 (2515)  5 exp Animals/ not Humans/ (4428087)  6 4 not 5 (2504)  7 (exp child/ or exp Infant/) not exp adult/ (1537163)  8 6 not 7 (2096) | Embase  1 exp Hypoxia/ or exp respiratory failure/ or (hypox?em\* or hypoxia or hypoxic or Anoxia or anox?emi\* or hypoxidosis or ((breathing or ventilat\* or respirat\* or oxygen) adj6 (insufficien\* or deficien\* or fail\* or distress\* or depress\* or support\*))).ti,ab,hw,kw. or Critical Illness/ or exp intensive care/ or exp Intensive Care Unit/ or (ICU or ((intensive or critical) adj3 (care or unit\*)) or (critical\* adj3 ill\*)).ti,ab,hw,kw. (1138979)  2 noninvasive ventilation/ or (((non invasive or noninvasive) adj6 (ventilat\* or respirat\*)) or NIV).ti,ab,hw,kw. (16457)  3 positive end expiratory pressure/ or ((positive adj3 airway adj3 pressure\*) or ((positive or airway) adj3 pressure adj3 (respirat\* or ventilat\*)) or (positive adj3 expiratory adj3 pressure\*) or CPAP or nCPAP or BiPAP).ti,ab,hw,kw. (57431)  4 1 and 2 and 3 (5988)  5 exp animal/ not exp human/ (4647289)  6 4 not 5 (5958)  7 exp child/ not exp adult/ (1840712)  8 6 not 7 (4998) |
| Central  #1 MeSH descriptor: [Hypoxia] explode all trees 1473  #2 MeSH descriptor: [Respiratory Insufficiency] explode all trees 2061  #3 MeSH descriptor: [Critical Illness] explode all trees 1632  #4 MeSH descriptor: [Critical Care] explode all trees 2219  #5 MeSH descriptor: [Intensive Care Units] explode all trees 3520  #6 (hypox\*em\* or hypoxia or hypoxic or Anoxia or anox\*emi\* or hypoxidosis or ((breathing or ventilat\* or respirat\* or oxygen) near/6 (insufficien\* or deficien\* or fail\* or distress\* or depress\* or support\*)) or ICU or ((intensive or critical) near/3 (care or unit\*)) or (critical\* near/3 ill\*)) 54169  #7 #1 or #2 or #3 or #4 or #5 or #6 55299  #8 MeSH descriptor: [Noninvasive Ventilation] explode all trees 150  #9 ((non invasive or noninvasive) near/6 (ventilat\* or respirat\*)) or NIV 1956  #10 #8 or #9 1956  #11 MeSH descriptor: [Positive-Pressure Respiration] explode all trees 2574  #12 MeSH descriptor: [Continuous Positive Airway Pressure] explode all trees 992  #13 (positive near/3 airway near/3 pressure\*) or ((positive or airway) near/3 pressure near/3 (respirat\* or ventilat\*)) or (positive near/3 expiratory near/3 pressure\*) or CPAP or nCPAP or BiPAP 6914  #14 #11 or #12 or #13 6937  #15 #7 and #10 and #14 761  #16 #15 not ((paediatric\* or pediatric\* or child\* or infant\*) not (adult\* or aged or elderly)) in Trials 474 | Cinahl  S1 (MH "Anoxia+") or (MH "Respiratory Failure+") or (MH "Critical Illness") or (MH "Critical Care+") or (MH "Intensive Care Units+") or TX ((hypox\*em\* or hypoxia or hypoxic or Anoxia or anox\*emi\* or hypoxidosis or ((breathing or ventilat\* or respirat\* or oxygen) N6 (insufficien\* or deficien\* or fail\* or distress\* or depress\* or support\*))) or (ICU or ((intensive or critical) N3 (care or unit\*)) or (critical\* N3 ill\*)))  176,095  S2 TX (((non invasive or noninvasive) N6 (ventilat\* or respirat\*)) or NIV)  2,208  S3 (MH "Continuous Positive Airway Pressure") OR (MH "Positive Pressure Ventilation+") OR (MH "Positive End-Expiratory Pressure") or TX ((positive N3 airway N3 pressure\*) or ((positive or airway) N3 pressure N3 (respirat\* or ventilat\*)) or (positive N3 expiratory N3 pressure\*) or CPAP or nCPAP or BiPAP)  7,474  S4 S1 AND S2 AND S3  840  S5 (MH "Animals+") not (MH "Human")  34,468  S6 S4 not S5  835  S7 (MH "Child+") not (MH "Adult+")  275,437  S8 S6 not S7  714 |

**Appendix - Table of Grade recommendations.9**

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| Grade of Recommendation | Clarity of risk/benefit | Quality of supporting evidence | Implications |
| 1A.  Strong recommendation, high quality evidence | Benefits clearly outweigh risk and burdens, or vice versa. | Consistent evidence from well performed randomised, controlled trials or overwhelming evidence of some other form. Further research is unlikely to change our confidence in the estimate of benefit and risk. | Strong recommendations, can apply to most patients in most circumstances without reservation. Clinicians should follow a strong recommendation unless a clear and compelling rationale for an alternative approach is present. |
| 1B.  Strong recommendation, moderate quality evidence | Benefits clearly outweigh risk and burdens, or vice versa. | Evidence from randomised, controlled trials with important limitations (inconsistent results, methodological flaws, indirect or imprecise), or very strong evidence of some other research design. Further research (if performed) is likely to have an impact on our confidence in the estimate of benefit and risk and may change the estimate. | Strong recommendation and applies to most patients. Clinicians should follow a strong recommendation unless a clear and compelling rationale for an alternative approach is present. |
| 1C.  Strong recommendation, low quality evidence | Benefits appear to outweigh risk and burdens, or vice versa. | Evidence from observational studies, unsystematic clinical experience, or from randomised, controlled trials with serious flaws. Any estimate of effect is uncertain. | Strong recommendation, and applies to most patients. Some of the evidence base supporting the recommendation is, however, of low quality. |
| 2A.  Weak recommendation, high quality evidence | Benefits closely balanced with risks and burdens. | Consistent evidence from well performed randomised, controlled trials or overwhelming evidence of some other form. Further research is unlikely to change our confidence in the estimate of benefit and risk. | Weak recommendation, best action may differ depending on circumstances or patients or societal values. |
| 2B.  Weak recommendation, moderate quality evidence | Benefits closely balanced with risks and burdens, some uncertainly in the estimates of benefits, risks and burdens. | Evidence from randomised, controlled trials with important limitations (inconsistent results, methodological flaws, indirect or imprecise), or very strong evidence of some other research design. Further research (if performed) is likely to have an impact on our confidence in the estimate of benefit and risk and may change the estimate. | Weak recommendation, alternative approaches likely to be better for some patients under some circumstances. |
| 2C.  Weak recommendation, low quality evidence | Uncertainty in the estimates of benefits, risks, and burdens; benefits may be closely balanced with risks and burdens. | Evidence from observational studies, unsystematic clinical experience, or from randomised, controlled trials with serious flaws. Any estimate of effect is uncertain. | Very weak recommendation; other alternatives may be equally reasonable. |