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| 3-4 Bronchospasm v.3 |
| Signs and symptoms include: expiratory wheeze, prolonged expiration, increased inflation pressures, desaturation, hypercapnia, upsloping capnograph trace, silent chest.  Can occur alone or as part of another problem. |

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| Box A: ALTERNATES and MIMICS |
| Wheeze: pulmonary oedema; ARDS; laryngospasm  Raised airway pressure: obstruction of larynx, trachea or bronchi; decreased lung compliance; pneumothorax |

START.

❶ Call for help and inform theatre team of problem.

❷ Give 100% oxygen.

❸ Stop surgery / other stimulation.

❹ Fully expose the chest and perform a rapid systematic examination:

* Inspect, percuss, palpate, auscultate.
* Absence of wheeze may indicate severe bronchospasm with no air movement.

❺ Deepen anaesthesia:

* Inhalational anaesthetic agents are bronchodilators AND bronchospasm may be a consequence of light anaesthesia.
* Avoid isoflurane or desflurane if possible – airway irritant if increased rapidly.

❻ Exclude conditions that may be misinterpreted as bronchospasm:

* Mispositioned or occluded airway device
* Endobronchial or oesophageal intubation
* Occlusion of breathing system – check all hoses
* Consider other conditions mimicking bronchospasm (Box A).

❼ Consider anaphylaxis; if suspected **→ 3-1**

❽ Treat bronchospasm (Box B). First line is salbutamol by metered dose inhaler or by nebuliser (remove HME filter or nebulise downstream); i.v. route is second line. Other drugs at clinician discretion.

**❾** If airway soiling/aspiration suspected airway, see Box C.

❿ Use appropriate ventilation strategy (Box D).

⓫ If raised airway pressure and/or desaturation persists, consider **→ 2-2 Hypoxia/ desaturation/cyanosis.**

⓬ Obtain a chest X-ray as soon as clinically safe to do so.

⓭ Plan appropriate placement for post-procedure care.

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| Box B: DRUG DOSES | |
| Salbutamol    Ipratropium  Adrenaline  Magnesium  Ketamine  Aminophylline  Hydrocortisone | Nebuliser: Child <5 yr, 2.5 mg; Adult and >5 yr 5 mg  **(Remove HME filter OR nebulise downstream)**  i.v. bolus: Adult 250 µg diluted, slowly; Child 1-23 months 5 µg.kg-1 once over 5 mins; Child 2-17 years 15 µg.kg-1 once over 5 mins (max. 250 µg)  Adult i.v. infusion: 5-20 µg.min-1  Child i.v. infusion: 0.5-1 µg.kg-1.min-1 (max.20 µg.min-1)  Neb: 2-12 yr 0.25 mg; Adult 0.5 mg  Neb: Child 0.5 ml of 1:1000  Neb: Adult 5 ml of 1:1000  i.m.: <6 mo 50 µg; <6 yr 120 µg; <12 yr 250 µg; Adult 500 µg  Slow i.v. bolus: 0.1 - 1 µg.kg-1 (Adult 10-100 µg)  i.v. over 20 min: 50 mg.kg-1 (Adult 2 g)  Bolus: Adult 20 mg  i.v. Infusion: 1-3 mg.kg-1.hr-1  i.v. over 20 min: 5 mg.kg-1 (omit if already on theophylline)  i.v. infusion:  <9 yr 1 mg.kg-1.hr-1; <16 yr 0.8 mg.kg-1.h-1; Adult 0.5 mg.kg-1.h-1  4 mg.kg-1 (Adult 200 mg) |

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| Box C: ACTIONS IF AIRWAY SOILING/ASPIRATION |
| Consider tracheal intubation and tracheal toilet  Use nasogastric tube to aspirate gastric contents |

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| Box D: VENTILATION STRATEGIES |
| Increase expiratory time to allow complete expiration  Pressure control ventilation may be better  Be alert to ‘breath stacking’  Permissive hypercapnia may be appropriate |

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3-4