Life-Threatening Asthma

Fatal Asthma Risk Factors

- Drug/alcohol abuse
- Inner-city
- African-American, Hispanic
- Major psychiatric disorder
- Poverty

Fatal Asthma – Individual Risk Factors

- Prior intubation or hypercapnia
- Severe attack despite oral steroids
- Highly labile asthma
- Prior sudden onset attacks
- Marked morning dipping

Severe Asthma

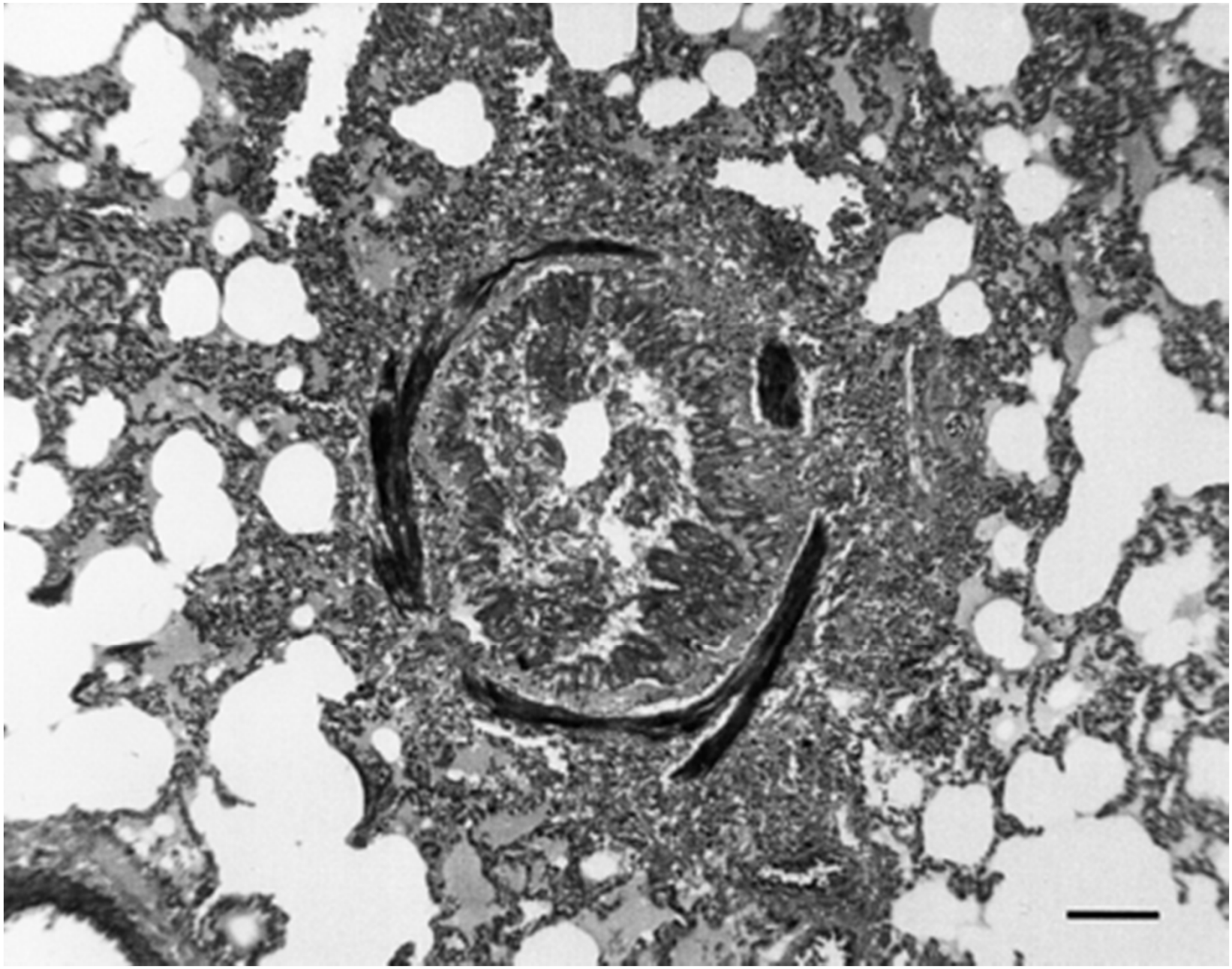
- Dyspnea at rest; RR > 30; talks in words
- May be agitated
- Use of accessory muscles
- Loud wheezing
- Pulsus paradoxus > 25 mm Hg
- PEF < 40%
- PaO_2 < 60 mm Hg, cyanosis
- PCO_2 > 42

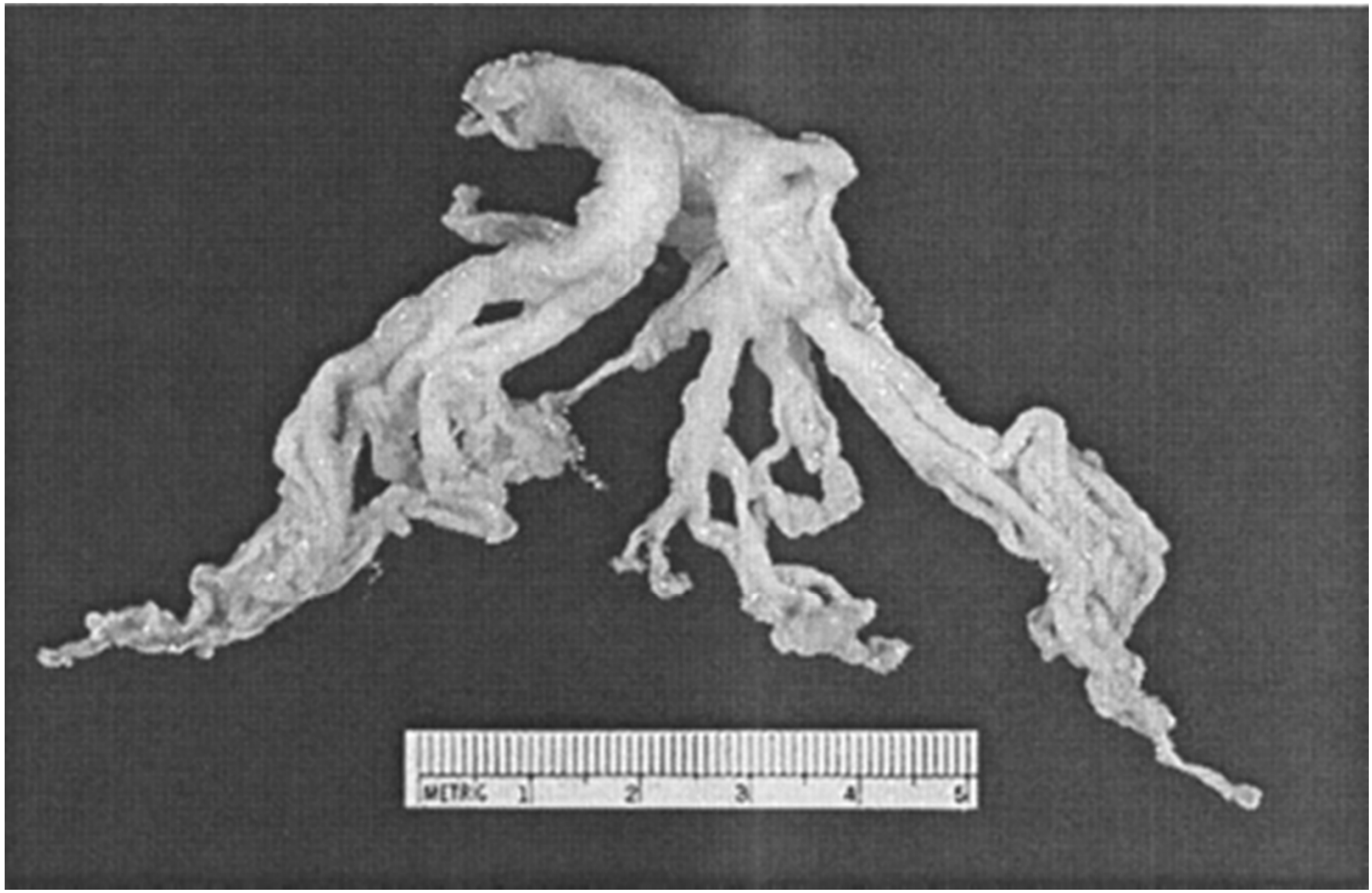
Signs of Imminent Respiratory Arrest

- Lethargy or confusion
- Paradoxical thoracoabdominal movement
- Absence of wheeze
- Bradycardia
- Pulsus paradoxus may be absent due to muscle fatigue
- PEF < 25%

Mechanisms

- Bronchoconstriction
- Airway inflammation
- Mucous impaction
- Hyperinflation
- Increased airway resistance
- Respiratory muscle fatigue
- Complications: pneumothorax, pneumonia, atelectasis, pulmonary edema, cardiac dysfunction

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Treatment

- Supplemental O2
- Inhaled B2-agonists: albuterol intermittent nebs 2.5 – 5 mg every 20 min x 3 or continuous at 10- 15 mg/h; MDI with spacer 4- 8 puffs every 20 min for up to 4 hours, then every 1 – 4 hours
- IV corticosteroids

Adjunctive Therapy

- Ipratropium nebulizer every 4- 6 hours
- Magnesium sulfate
- Heliox: decreased viscosity compared to ambient air
- SC epinephrine 1:1000 0.3 – 0.5 mg – if unable to use inhaled medications
- BiPAP for selected alert and cooperative patients

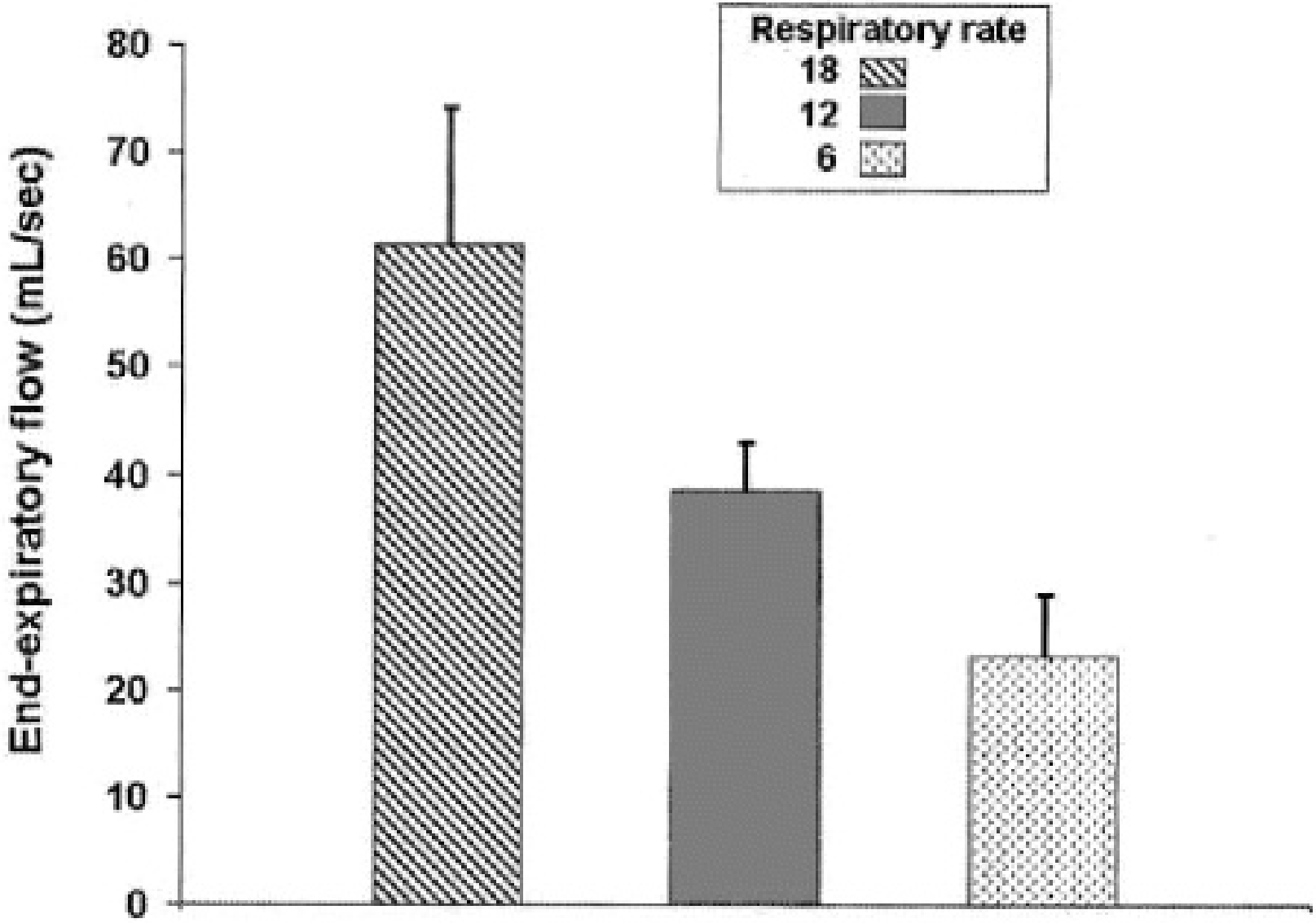
Indications for Endotracheal Intubation

- Deterioration despite treatment
- Fatigue and exhaustion
- Onset of altered LOC, lethargy, confusion
- Rising pCO2
- Falling pO2

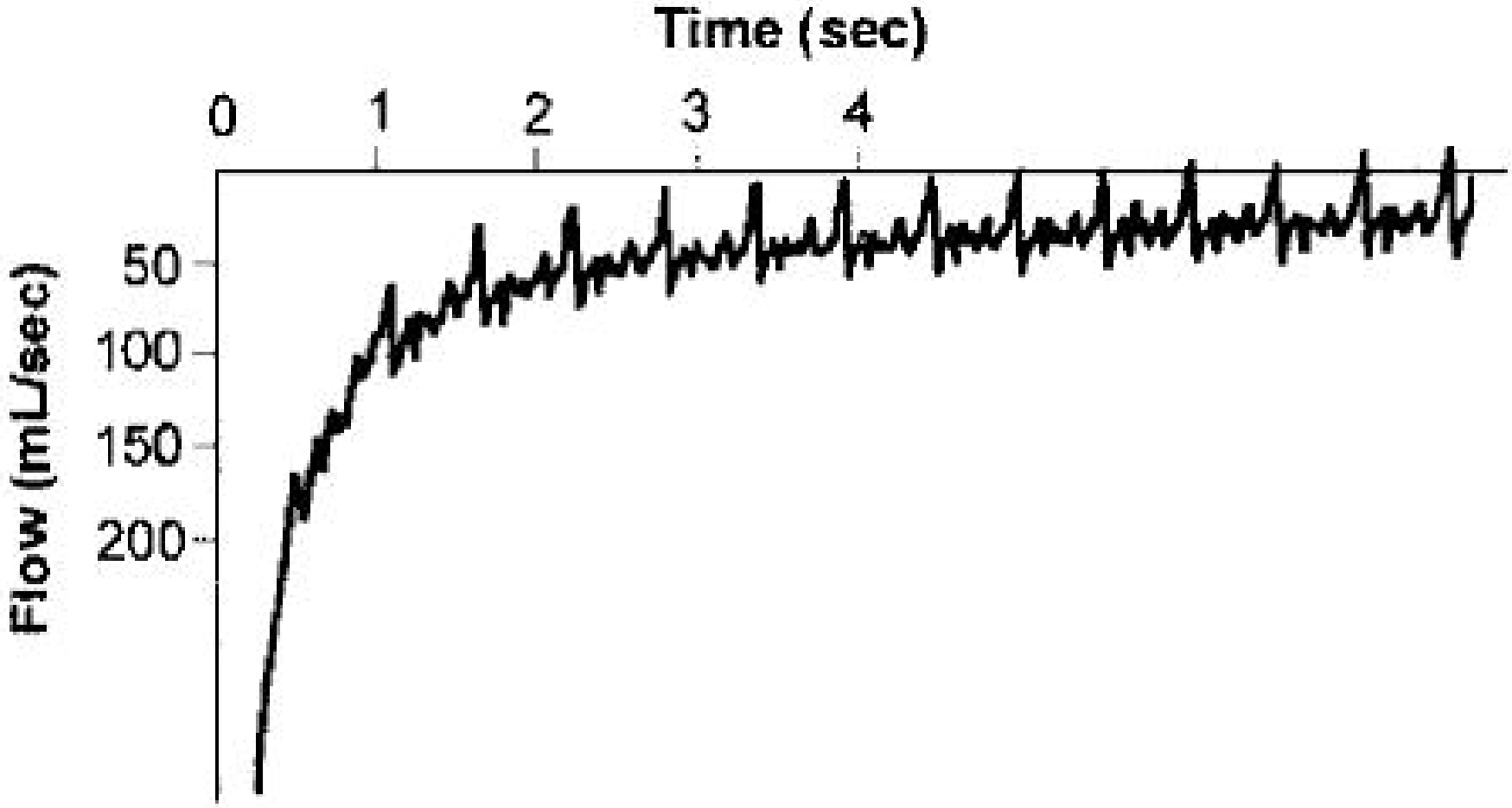
Ventilation

- RR 6 – 10 / min
- Avoid auto-PEEP – allow time for exhalation; maximize I:E ratio
- “Permissive” hypercapnea
- Adequate sedation and NM paralysis

Expiratory Time in Status Asthmaticus: Effect on End-Expiratory Flow Rate



Leatherman et al Crit Care Med 2004: 32: 1542-1545



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Hypoxia or Hypotension After Intubation

- Misplaced or obstructed ETT
- Significant air trapping with auto-PEEP
- Tension pneumothorax