Debate

Invasive Ventilation versus Non-invasive ventilation

Dr Deepak Chawla

For
Invasive Ventilation

Dr Deepak Chawla

Argument 1:

You can not escape the “Tube”

Exhibit 1.1: Hidden truth behind trials!

Study	Outcome
SUPPORT	Survival without need of ventilation at D7
	Days of ventilation
COIN	Need of ventilation
VON	Need of ventilation
	Days of ventilation

Exhibit 1.1: Hidden truth behind trials!

Study	Outcome	NIV group	IV group
SUPPORT	Survival without need of ventilation at D7	55.3%	48.8%
	Days of ventilation	24.8	27.7
COIN	Need of ventilation	59%	100% (by design)
VON	Need of ventilation	52.3-59.3%	95.7%
	Days of ventilation	9.2 to 12.5	7.7

Exhibit 1.2: Morbidities for which IV is needed

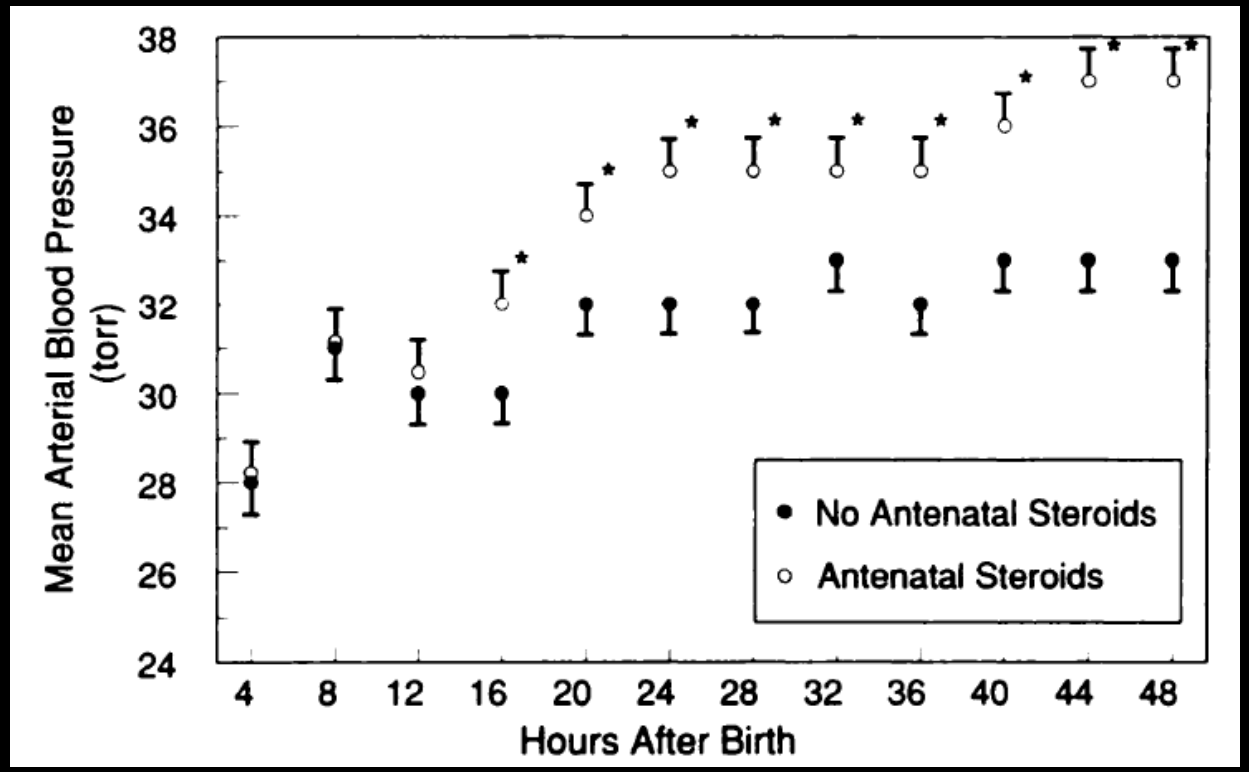
- Meconium aspiration syndrome
- Birth asphyxia with poor respiratory drive
- Persistent pulmonary hypertension of newborn
- Prolonged/repeated apnea of prematurity
- Surgical neonates

NNPD 2002-2003, n=145623

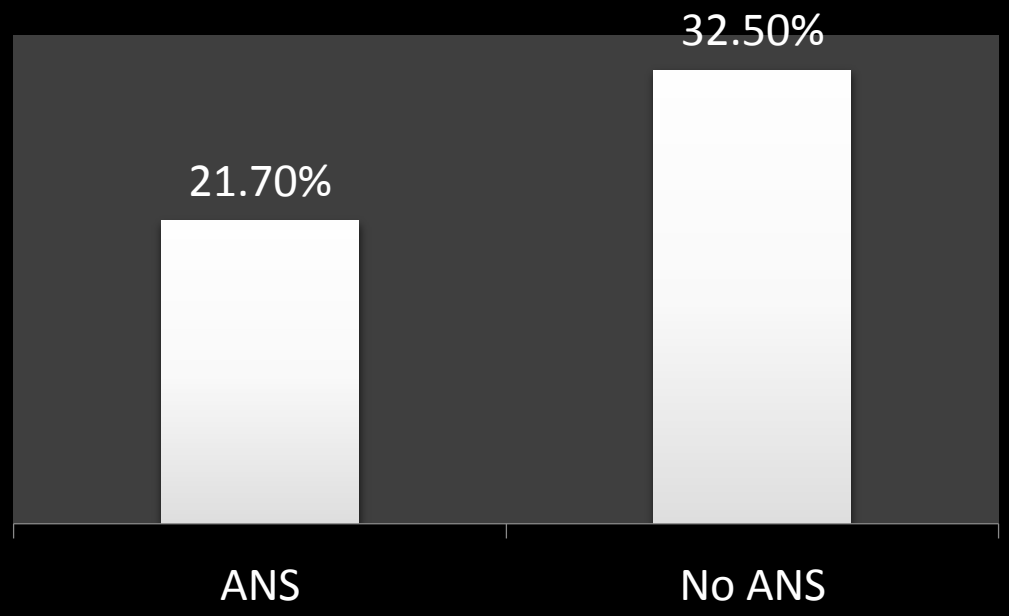
Argument 2:

For NIV to work you need steroids!

Exhibit 2.1: Effect of ANS



Need of respiratory support
RR: 0.69 (0.53-0.90)



Roberts & Dalziel Cochrane 2010
Moise et al Pediatrics 1995;95:845

Exhibit 2.2: NIV trial and steroids

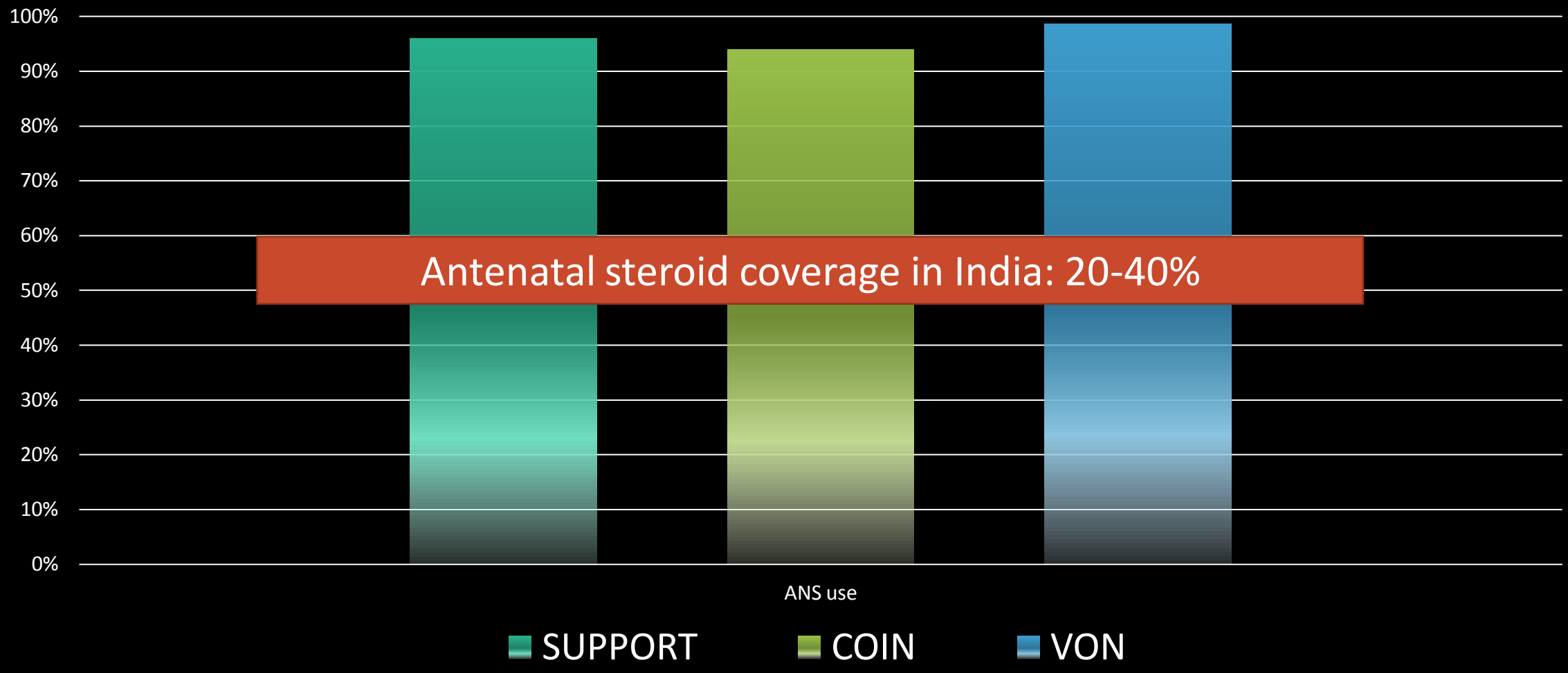


Exhibit 2.3: NIV trial and steroids

Outcome	Intervention (n=48698)	Control (n=52007)	RR (95% CI)
Neonatal deaths <7 days	21.9/1000	19.1/1000	1·12 (1·02–1·22)
Neonatal deaths <28 days	27.4/1000	23.9/1000	1·12 (1·02–1·22)
Suspected maternal infection	3%	2%	1.45 (1.33-1.58)

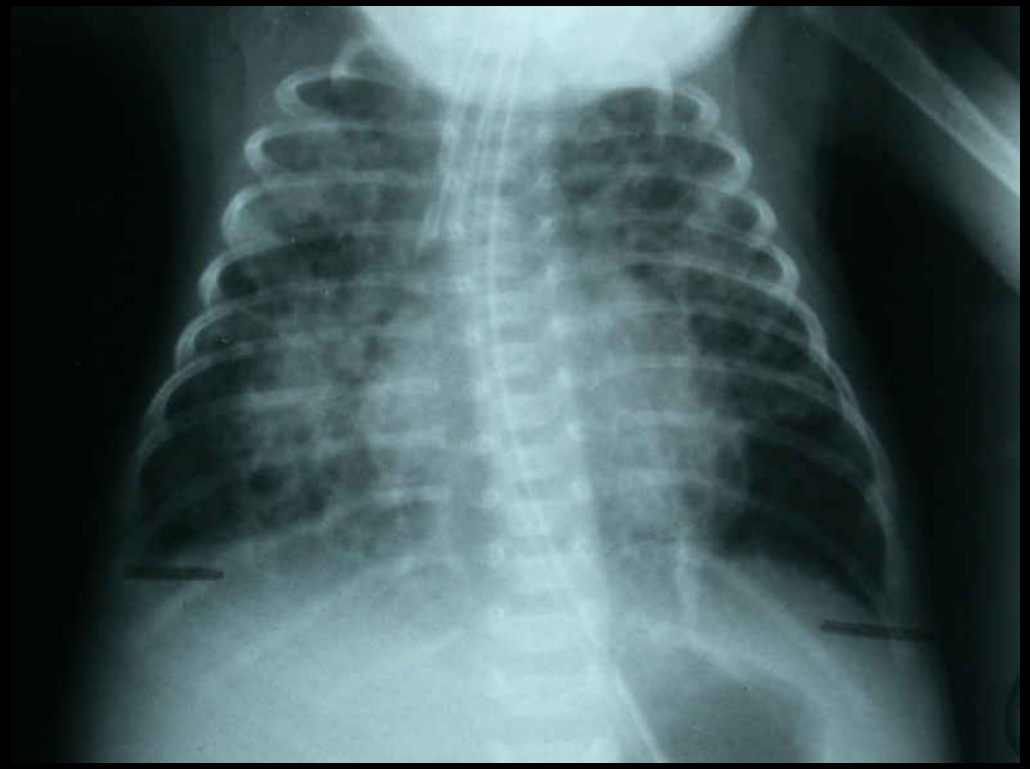
A population-based, multifaceted strategy to implement antenatal corticosteroid treatment versus standard care for the reduction of neonatal mortality due to preterm birth in low-income and middle-income countries: the ACT cluster-randomised trial

Argument 3:

Each has its own set of complications!

Exhibit 3.1: Complications

Invasive



Non-invasive

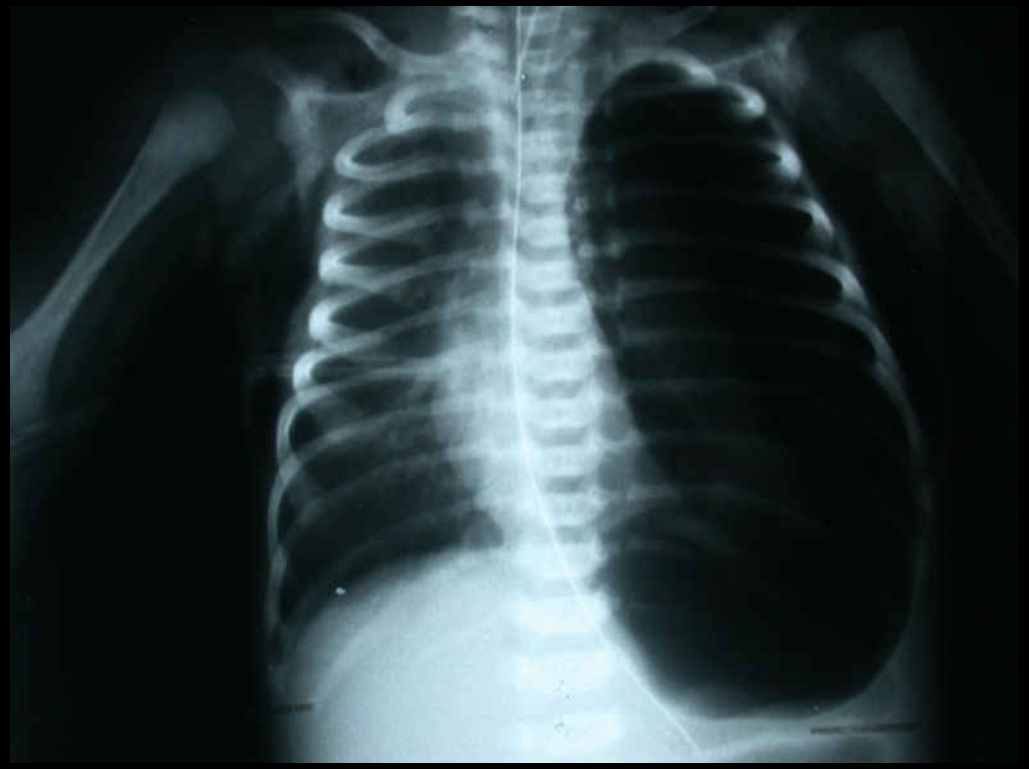


Exhibit 3.2: Complications

Invasive

- Bronchopulmonary dysplasia
- Pneumonia
- Laryngeal injury
- Tube block/displacement

Non-invasive

- Failure of CPAP
- Pneumonia
- Nasal injury
- CPAP belly
- Decreased venous return

Argument 4:

NIV is not less but more intensive!

Exhibit 4.1: More intensive monitoring

- Securing and maintaining proper fixation
- Monitor for CPAP failure
  - 25-40% may fail
- Monitor for side effects
  - CPAP belly
  - Nasal trauma
  - Infection

Evidence from India

Author (Year)	Study subjects	Design and intervention	Result
Tagare et al (2013)	Preterm neonates with respiratory distress within first 6 h of life	RCT Bubble-CPAP versus ventilator CPAP	Higher success rate with B-CPAP (82.5% vs. 63.2%)
Saxena et al (2012)	Preterm neonates with RDS	Observational Early CPAP and selective surfactant	Overall 88% survival CPAP successful in 61%
Yadav et al (2012)	Preterm neonates post-extubation	RCT Bubble-CPAP versus ventilator CPAP	Trend towards reduced extubation failure in BCPAP
Pillai et al (2011)	Preterm neonates with RDS	Observational Early CPAP	Predictors of CPAP failure: Gest<28, PPROM and Pressure X FiO2$\geq$1.28

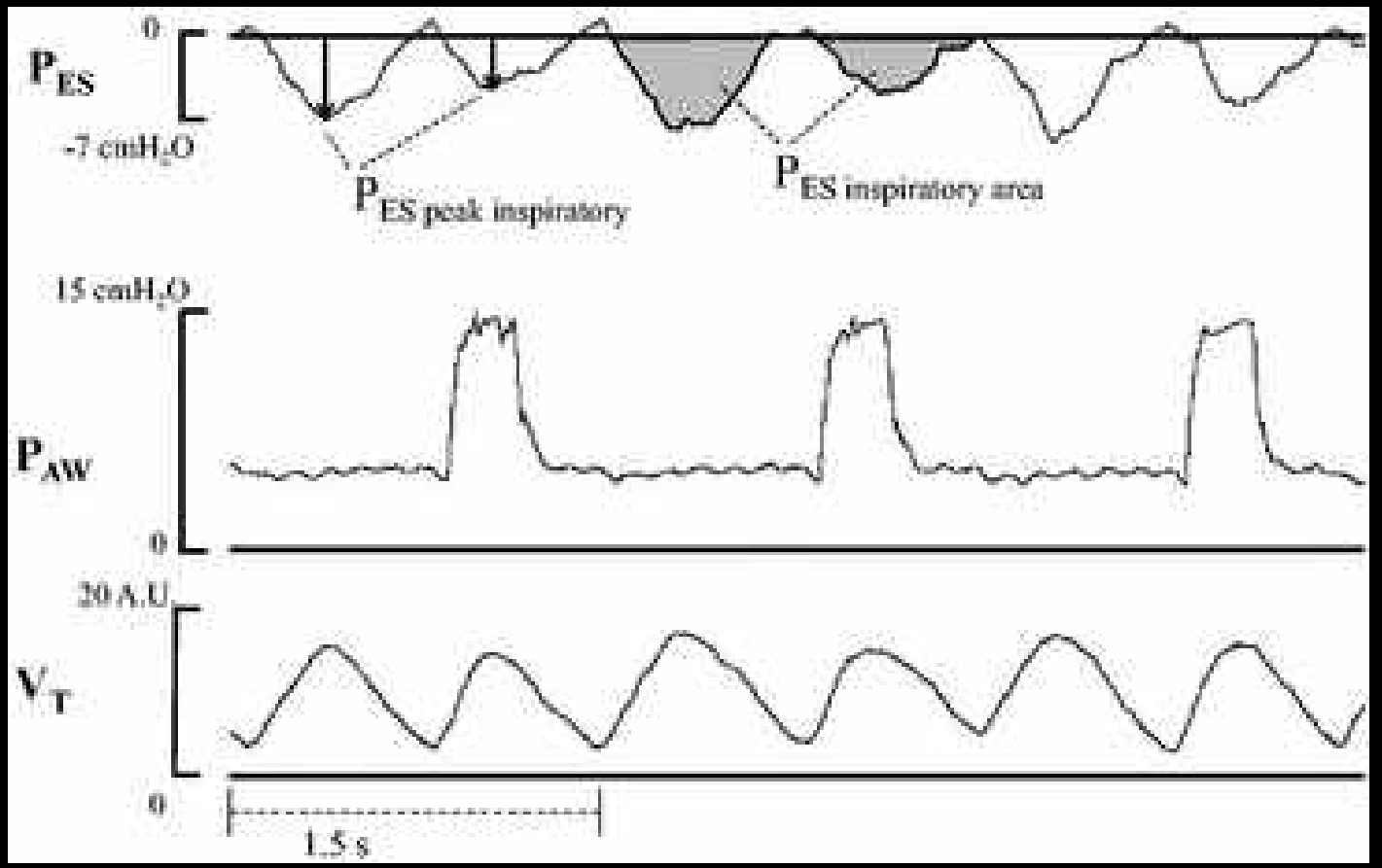
Evidence from India

Author (Year)	Study subjects	Design and intervention	Result
Tagare et al (2010)	Preterm neonates with respiratory distress within first 6 h of life	RCT Bubble-CPAP versus ventilator CPAP	Comparable success rate
Koti et al (2010)	Preterm neonates with RDS	Observational Bubble CPAP	CPAP successful in 75%
Kishhore et al (2009)	Preterm neonates with RDS	RCT CPAP versus NIPPV	Higher success rate of NIPPV
Urs et al (2009)	Preterm neonates with RDS	Observational Early B-CPAP	Successful in mild to moderate RDS and in neonates with ANS coverage

Argument 5:

You can not synchronize nasal ventilation!

Exhibit 5.1: Synchronization is needed



Pediatric Research (2011) **69**, 84–89

Exhibit 5.2: No true synchronization for NIPPV

Summary

1. Many babies will still need invasive ventilation
2. Without antenatal steroids NIV more likely to fail
3. Non-invasive ventilation can also cause complications
4. Non-invasive ventilation is not less intensive
5. Synchronization possible only with invasive ventilation