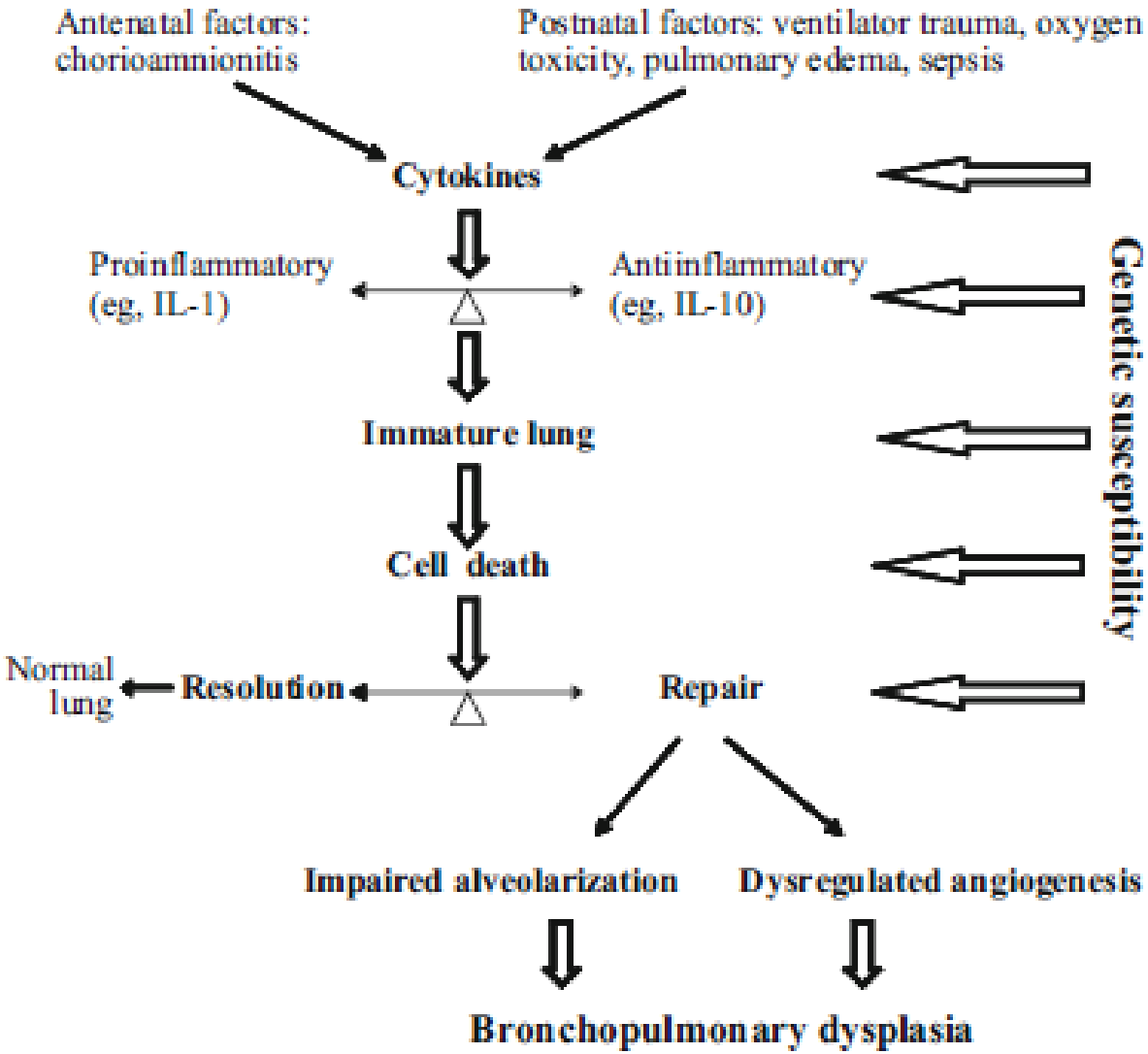
EVIDENCE BASED MEDICINE PREVENTION & MANAGEMENT BRONCHOPULMONARY DYSPLASIA

Diagnostic criteria for BPD

	MILD Supplemental O2 (for 28 days) and	MODERATE Supplemental O2 (for 28 days) and	SEVERE Supplemental O2 (for 28 days) and
<32 weeks GA at birth	RA at 36 weeks corrected GA or at discharge	<0.3 FiO2 at 36 weeks corrected GA or at Discharge	≥0.3 FiO2 +/– positive pressure support at 36 weeks corrected GA or at discharge
≥32 weeks GA at birth	RA by postnatal day 56 or at discharge	<0.3 FiO2 by postnatal day 56 or at discharge	≥0.3 FiO2 +/– positive pressure support by postnatal day 56 or at discharge

PATHOLOGY


Antenatal factors: chorioamnionitis
Postnatal factors: ventilator trauma, oxygen toxicity, pulmonary edema, sepsis
Cytokines
Proinflammatory (eg, IL-1)
Antiinflammatory (eg, IL-10)
Immature lung
Cell death
Normal lung
Resolution
Repair
Genetic susceptibility
Impaired alveolarization
Dysregulated angiogenesis
Bronchopulmonary dysplasia

EVIDENCE CLASSIFICATION

(THE U.S. PREVENTIVE SERVICES TASK FORCE)

- **Level I**: at least one properly designed randomized controlled trial.
- **Level II-1**: well-designed controlled trials without randomization.
- **Level II-2**: well-designed cohort or case-control analytic studies, preferably from more than one center or research group.
- **Level II-3**: multiple time series +/- without the intervention. Dramatic results in uncontrolled trials might also be regarded as this type of evidence.
- **Level III**: Opinions of respected authorities, based on clinical experience, descriptive studies, or reports of expert committees

Recommendation

(the U.S. Preventive Services Task Force)

- **Level A**: Good scientific evidence suggests that the benefits substantially outweigh the potential risks.
- **Level B**: At least fair scientific evidence suggests that the benefits outweigh the potential risks.
- **Level C**: At least fair scientific evidence suggests that there are benefits provided, but the balance between benefits and risks are too close for making general recommendations.
- **Level D**: At least fair scientific evidence suggests that the risks outweigh potential benefits.
- **Level I**: Scientific evidence is lacking, of poor quality, or conflicting, such that the risk versus benefit balance cannot be assessed

Prevention & Management of BPD

Question?

1. Oxygen supplementation?
2. Ventilatory strategy?
3. Methylxanthines ?
4. Steroid ?
5. Fluids, diuretics & nutrition?

EARLY PHASE (UP TO 1 POSTNATAL WEEK)

Therapeutic intervention	Current status	Level of evidence	Level of recommendation
Oxygen supplementation	SPO2 <95%, usually between 85–93%	I	A
Ventilatory strategy	•Avoid intubation. If intubated, give "early" surfactant •Short inspiratory times (0.24–0.4s) •Rapid rates (40–60/min), low PIP (14–20 cmH2O), moderate PEEP (4–6 cmH2O),low tidal volume (3–6 mL/kg) •Extubate early to SNIPPV/NCPAP •Blood gas targets: pH 7.25–7.35, PaO2 40–60 mmHg • PaCO2 45–55 mmHg •High frequency ventilation for "rescue", if conventional ventilation fails	I I III I III I I	A A B A B C A
Methylxanthines	↑successful extubation rate , ↓ BPD	I	A
Vitamin A	5000 IU IM 3 times/ week x 4 weeks→ 1/14-15 additional infant survived without BPD	I	A
Fluids	Restrictive fluid intake may ↓ BPD	II-2	B
Nutrition	↑energy intake	I	B

EVOLVING PHASE (>1 POSTNATAL WEEK TO 36 WEEKS PMA)

Therapeutic intervention	Current status	Level of evidence	Level of recommendation
Oxygen supplementation	Same as in Table 1	I	A
Ventilatory strategy	•Avoid endotracheal tube ventilation. Maximize non-invasive ventilation (SNIPPV/NCPAP) for respiratory support •Blood gas targets: pH 7.25–7.35 PaO_2 40–60 mmHg $PaCO_2$ 45–55 mmHg	I III	A B
Methylxanthines	Same as in Table 1	I	A
Vitamin A	Same as in Table 1. If using, continue for 4 postnatal weeks	I	A
Steroids	•Dexamethasone: wean off mechanical ventilation, used “moderately early” and “delayed” •↑ incidence of neurological sequelae with early use (<96 hours)	I I	A D
Diuretics	•Furosemide: daily/ every other day with transient improvement in lung function •Spironolactone and Thiazides: chronic therapy improves lung function, ↓ O_2 requirements	I I	B B
Nutrition	Same as in Table 1	I	B

ESTABLISHED PHASE (>36 WEEKS PMA)

Therapeutic intervention	Current status	Level of evidence	Level of recommendation
Oxygen supplementation	For prevention of pulmonary hypertension & cor-pulmonale, generally ~95%	III	C
Ventilatory strategy	Blood gas targets: pH 7.25–7.35, PaO2 40–60 mmHg, PaCO2 45–55 mmHg	III	B
Steroids	Hydrocrtisone: 5mg/kg/day X 3 days→ ↓ 7-10 days Dexamethasone for 3 days: 0.1mg/kg/12h – 0.075mg/kg/12h – 0.05mg/kg/12h	II	B
Diuretics	Chronic therapy as in Table 2	I	B
Nutrition	Same as in Table 1	I	B
Immunization	Prophylaxis against RSV and influenza →↓ incidence of rehospitalization and morbidity	I	A

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THANKS FOR YOUR
ATTENTION !