TORTONA 6 OTTOBRE 2012

Rianimazione in sala parto: *novità* nelle linee guida internazionali 2010

Claudio Martano
Terapia Intensiva Neonatale – Università di Torino

2000

ELSEVIER

Resuscitation 40 (1999) 71–88

RESUSCITATION

Special Report

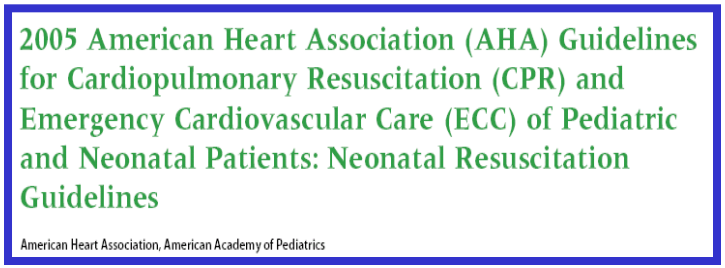
Resuscitation of the newly born infant:
an advisory statement from the Pediatric Working Group of the International Liaison Committee on Resuscitation☆

John Kattwinkel [a,b,*], Susan Niermeyer [a,c], Vinay Nadkarni [a,c], James Tibballs [d], Barbara Phillips [e], David Zideman [e], Patrick Van Reempts [e], Martin Osmond [f]

[a] American Academy of Pediatrics, Elk Grove Village, IL, USA
[b] Neonatal Resuscitation Program, Elk Grove Village, IL, USA
[c] American Heart Association, Dallas, USA
[d] Australian Resuscitation Council, Sydney, Australia
[e] European Resuscitation Council, Paris, France
[f] Heart and Stroke Foundation of Canada, Toronto, Canada

Accepted 13 January 1999

2005



2005 American Heart Association (AHA) Guidelines for Cardiopulmonary Resuscitation (CPR) and Emergency Cardiovascular Care (ECC) of Pediatric and Neonatal Patients: Neonatal Resuscitation Guidelines

American Heart Association, American Academy of Pediatrics

2010

PEDIATRICS®

OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

Neonatal Resuscitation: 2010 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations

Jeffrey M. Perlman, Jonathan Wyllie, John Kattwinkel, Dianne L. Atkins, Leon Chameides, Jay P. Goldsmith, Ruth Guinsburg, Mary Fran Hazinski, Colin Morley, Sam Richmond, Wendy M. Simon, Nalini Singhal, Edgardo Szyld, Masanori Tamura, Sithembiso Velaphi and on behalf of the NEONATAL RESUSCITATION CHAPTER COLLABORATORS

Pediatrics 2010;126;e1319-e1344; originally published online Oct 18, 2010; DOI: 10.1542/peds.2010-2972B

2015

GUIDELINES: Major Changes

2005 vs 2010

- Initial evaluation
- Meconium aspiration syndrome
- Oxygenation
- Ventilation
- Chest compressions
- Ethics
- Therapeutic hypothermia
- Cord clamping

AHA, AAP, Pediatrics 2006
AHA, AAP, Pediatrics 2010

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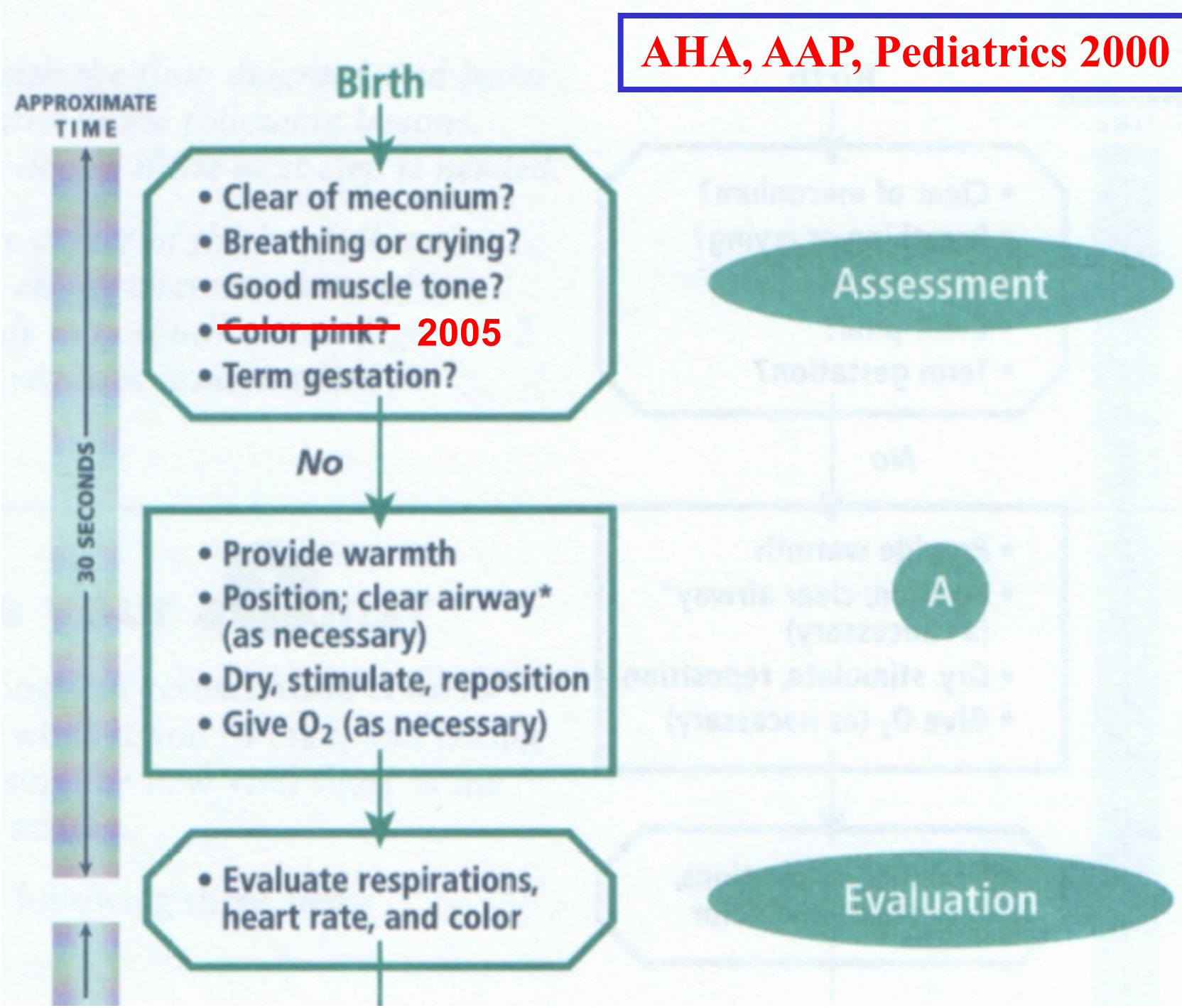
AHA, AAP, Pediatrics 2006
AHA, AAP, Pediatrics 2010

Initial evaluation

AHA, AAP, Pediatrics 2000

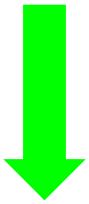


AHA, AAP, Pediatrics 2000

Initial evaluation

razionalizzazione: non cambia la sostanza !

Gungor S, Gynecol Obstet Invest 2006



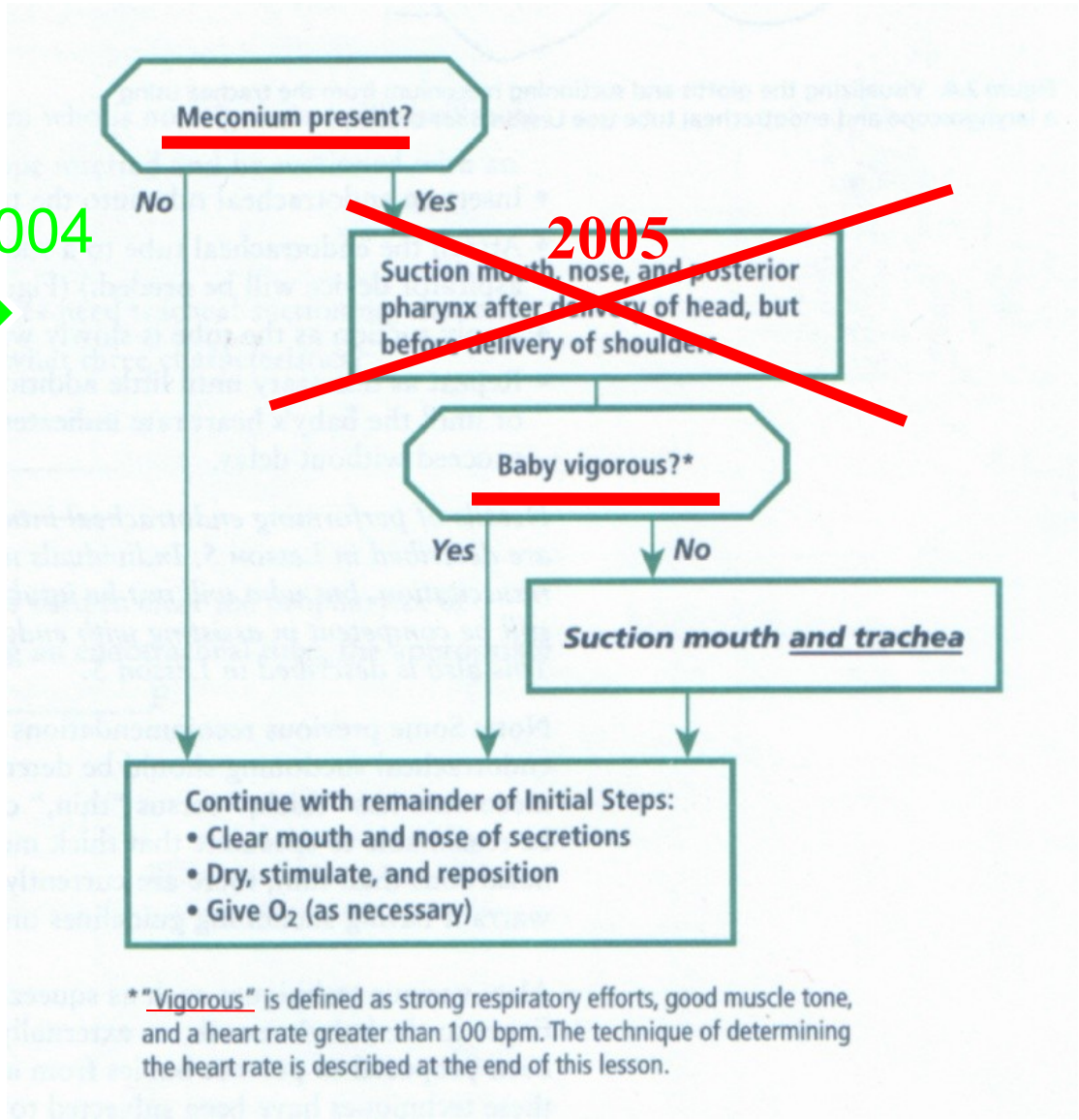
Treatment Recommendation

Routine intrapartum oropharyngeal and nasopharyngeal suctioning for infants born with clear or meconium-stained amniotic fluid is no longer recommended.

Perlman JM et al. Pediatrics, 2010

PRESENZA di MECONIO

Vain NE et al, Lancet 2004



AHA, AAP, Pediatrics, 2006

Perlman JM et al. Pediatrics, 2010

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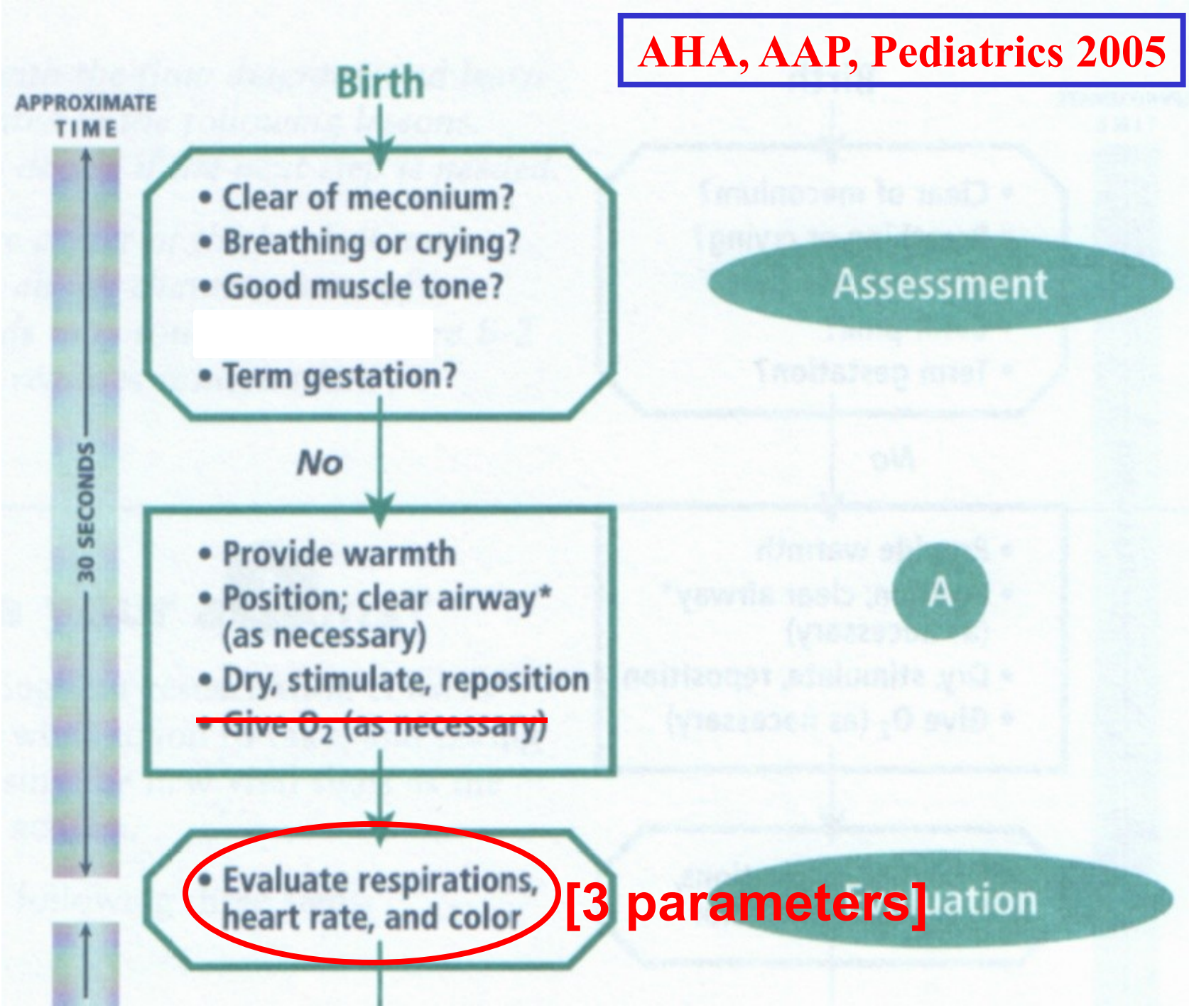
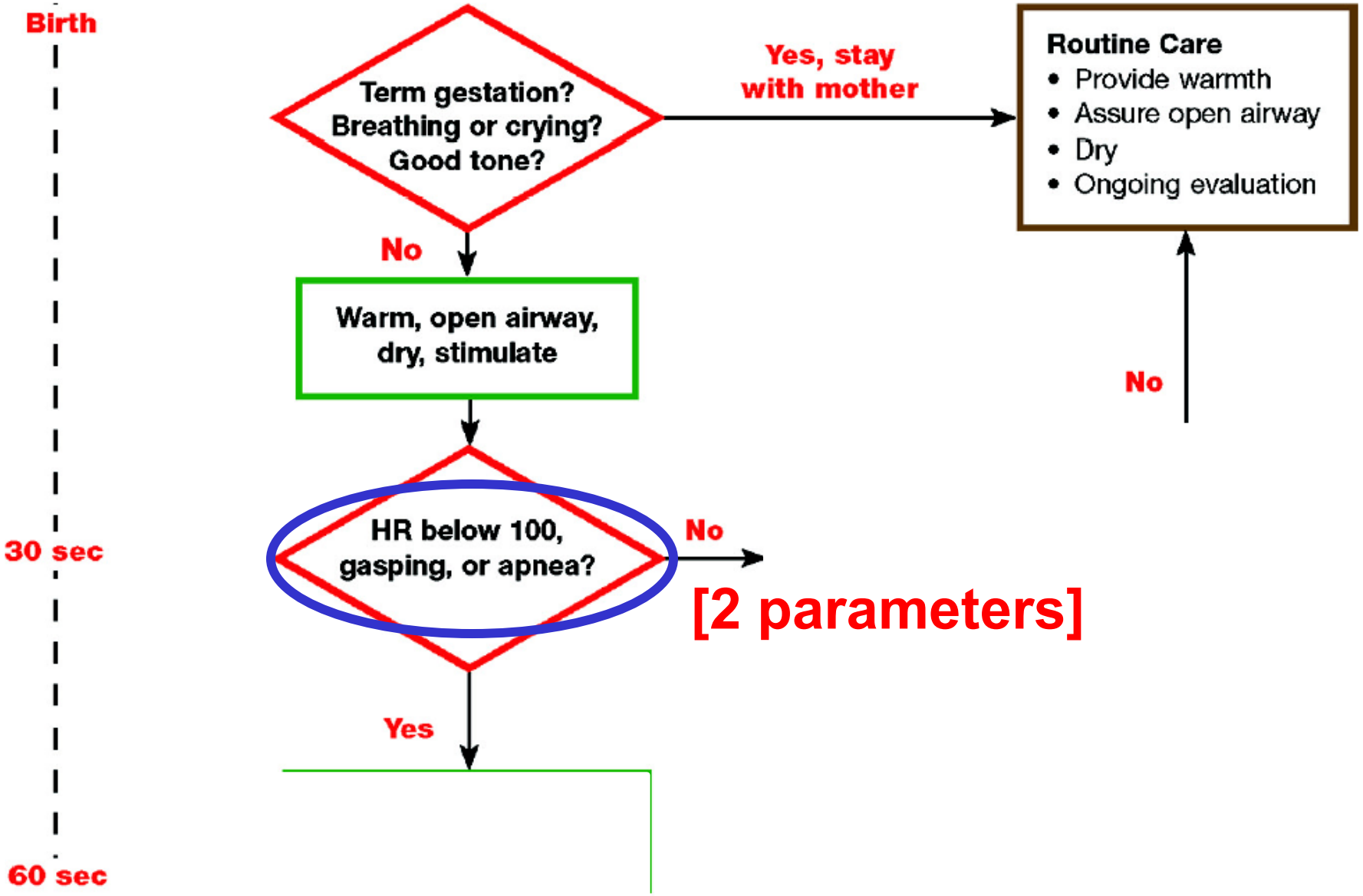
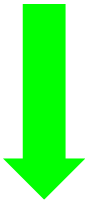




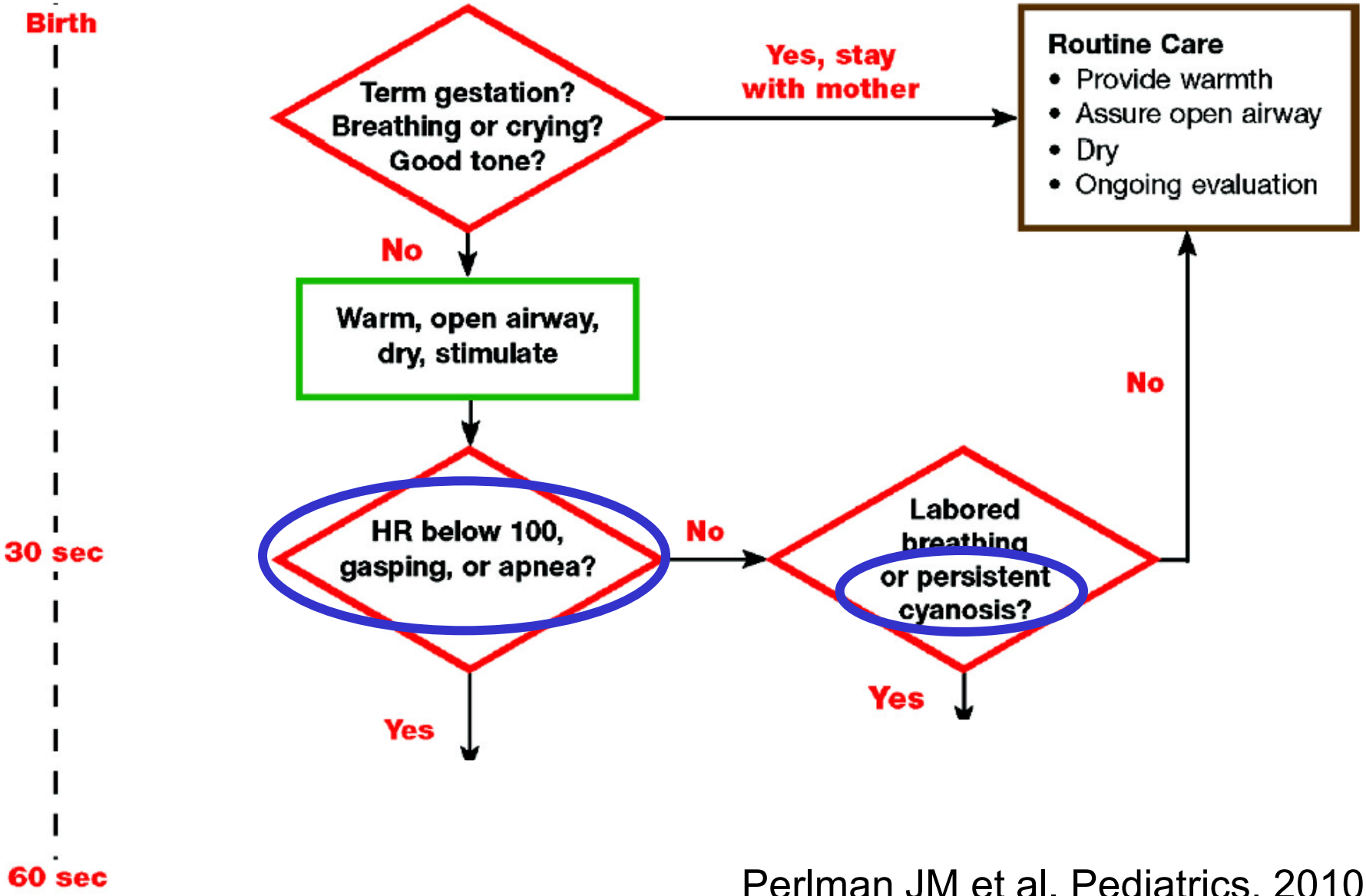
Perlman JM et al. Pediatrics, 2010

Owen CJ, Resuscitation 2004



Of the clinical assessments, auscultation of the heart is the most accurate, with palpation of the umbilical cord less so.

Perlman JM et al. Pediatrics, 2010



Perlman JM et al. Pediatrics, 2010

O'Donnell CPF, ADC Fetal & Neonatal Ed 2007

What this study adds

- Clinicians often disagree whether or not an infant is pink.
- When they agree, the oxygen saturation at which they perceive them to be pink varies widely.

Administration of a variable concentration of oxygen guided by pulse oximetry may improve the ability to achieve normoxia more quickly.

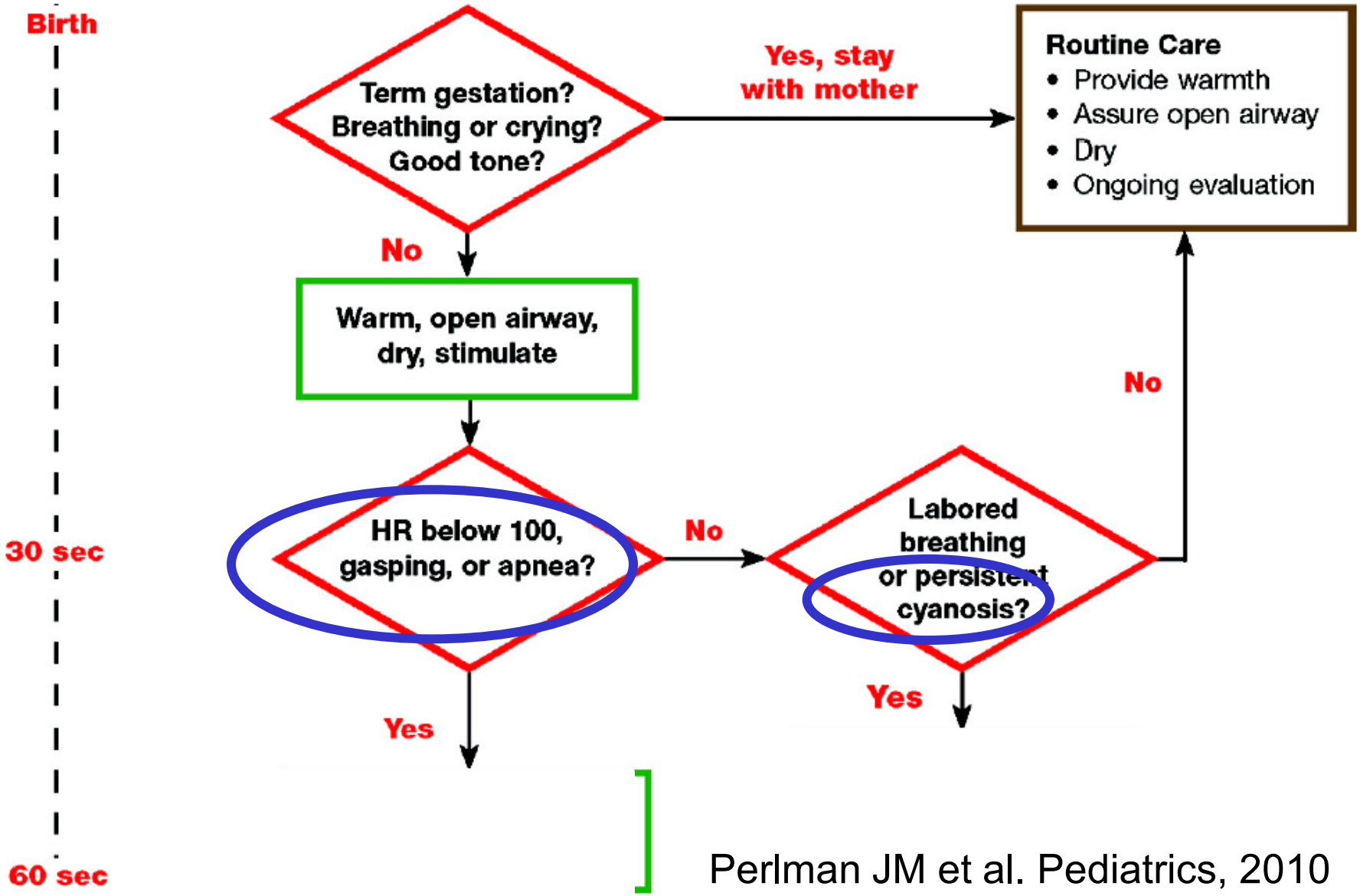
AHA, AAP, Pediatrics 2006

Administration of supplementary oxygen should be regulated by blending oxygen and air, and the concentration delivered should be guided by oximetry.

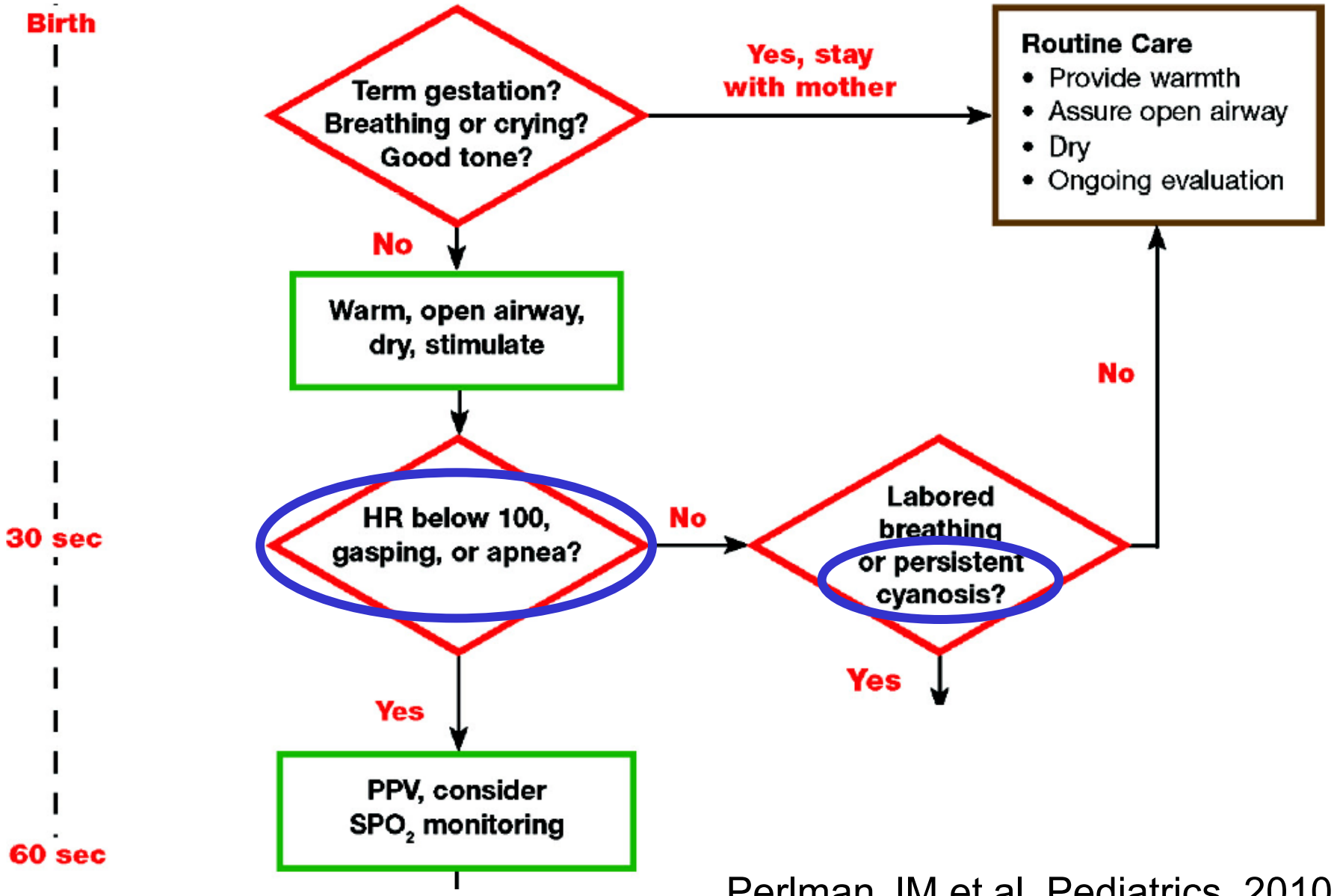
Perlman JM et al. Pediatrics, 2010

Targeted Preductal SpO_2 After Birth	
1 min	60%-65%
2 min	65%-70%
3 min	70%-75%
4 min	75%-80%
5 min	80%-85%
10 min	85%-95%

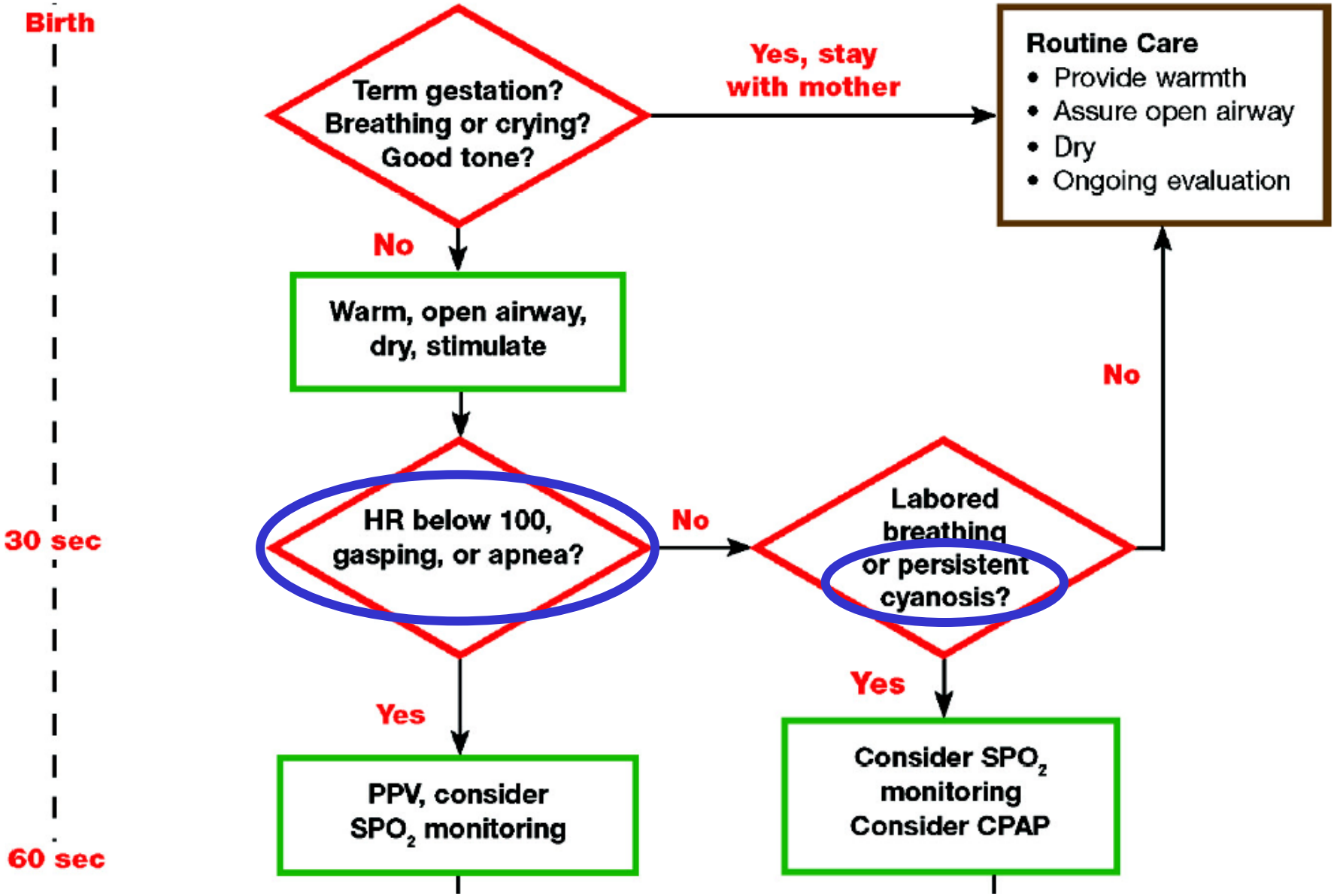
Kattwinkel J, Pediatrics 2010



Perlman JM et al. Pediatrics, 2010



Perlman JM et al. Pediatrics, 2010



Perlman JM et al. Pediatrics, 2010

… data is insufficient to justify a change from the recommendation that 100% oxygen be used if assisted ventilation is required.

AHA, AAP, Pediatrics **2000**

The standard approach to resuscitation is to use 100% oxygen.

AHA, AAP, Pediatrics **2006**

Some clinicians may begin resuscitation with an oxygen concentration of less than 100%, and some may start with no supplementary oxygen (ie, room air). There is evidence that employing either of these practices during resuscitation of neonates is reasonable.

AHA, AAP, Pediatrics **2006**

For babies born at term it is best to begin resuscitation with air rather than 100% oxygen.

Perlman JM et al. Pediatrics, 2010

Resuscitation of Preterm Neonates by Using Room Air or 100% Oxygen

Casey L. Wang, MD[a], Christina Anderson, MD[b], Tina A. Leone, MD[a], Wade Rich, RRT[a], Balaji Govindaswami, MBBS, MPH[b], Neil N. Finer, MD[a]

[a]Department of Pediatrics, Division of Neonatology, University of California, San Diego, California; [b]Santa Clara Valley Medical Center, San Jose, California

Start with 21% oxygen

Goal SpO2 80-85% at 5 minutes
Maintain SpO2 85-90% after 7 minutes

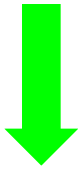
Immediately increase oxygen to 100% if:
Chest compressions or medications required
HR < 60 for 30 seconds or
HR < 100 at 2 minutes

If SpO2:	Blender:
< 70% at 3 min,	increase to 50% x30 sec
No Response:	increase to 75% x30 sec
No Response:	increase to 100%
< 85% at 5 min,	increase to 50% x30 sec
No Response:	increase to 75% x30 sec
No Response:	increase to 100%

FIGURE 1
Protocol for room air resuscitation. HR indicates heart rate; values are in beats per minute.

Wang CL, Pediatrics 2008

Wang CL, Pediatrics 2008



What This Study Adds

The current study is, to our knowledge, the first prospective, randomized comparison of the use of room air versus oxygen for the initial resuscitation of very preterm infants and raises concerns regarding the safety of room air for this population.

Because many preterm babies of <32 weeks' gestation will not reach target saturations in air, blended oxygen and air may be given judiciously and ideally guided by pulse oximetry. Both hyperoxemia and hypoxemia should be avoided. If a blend of oxygen and air is not available, resuscitation should be initiated with air.

Perlman JM et al. Pediatrics, 2010

[FiO2: 30% or 90%]

There is insufficient evidence in babies born at 32 to 37 weeks' gestation to define the appropriate oxygen administration strategy.

Perlman JM et al. Pediatrics, 2010

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AHA, AAP, Pediatrics 2006
AHA, AAP, Pediatrics 2010

(1) Characteristics of the initial assisted breaths and the role of positive end-expiratory pressure (PEEP)

PEEP:

PEEP is likely to be beneficial during initial stabilization of apneic preterm infants who require positive-pressure ventilation and should be used if suitable equipment is available.

T-PIECE vs AMBU

Perlman JM et al. Pediatrics, 2010

(2) Continuous positive airway pressure (CPAP) during or following resuscitation

CPAP:

Spontaneously breathing preterm infants who have respiratory distress may be supported with CPAP or intubation and mechanical ventilation. The most appropriate choice may be guided by local expertise and preferences.

SLI?

Perlman JM et al. Pediatrics, 2010

Characteristics of the initial assisted breaths and the role of positive end-expiratory pressure (PEEP)

INITIAL BREATHS:

initiation of intermittent positive-pressure ventilation at birth can be accomplished with either shorter or longer inspiratory times.

Perlman JM et al. Pediatrics, 2010

Laryngeal mask airways (LMAs) that fit over the laryngeal inlet have been shown to be effective for ventilating newly born near-term and full-term infants (LOE 2[50] and LOE 5[51]).

AHA, AAP, Pediatrics 2006

The laryngeal mask airway may be considered as an alternative to a face mask for positive-pressure ventilation among newborns weighing >2000 g or delivered at ≥34 weeks' gestation.

Perlman JM et al. Pediatrics, 2010

There is limited evidence, however, to evaluate its use for newborns weighing <2000 g or delivered at <34 weeks' gestation.

Perlman JM et al. Pediatrics, 2010

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AHA, AAP, Pediatrics 2006
AHA, AAP, Pediatrics 2010

Number needed to treat in relation to outcome

Table 2 | Effect of moderate hypothermia on neurological outcom with controls

	Risk ratio (95% CI)	Number needed to treat (95% CI)
Death or severe disability*	0.81 (0.71 to 0.93)	9 (5 to 25)
Survival with normal outcome†	1.53 (1.22 to 1.93)	8 (5 to 17)
Mortality	0.78 (0.66 to 0.93)	14 (8 to 47)
Severe disability in survivors*	0.71 (0.56 to 0.91)	9 (5 to 30)
Cerebral palsy in survivors	0.69 (0.54 to 0.89)	8 (5 to 24)
Severe neuromotor delay in survivors‡	0.73 (0.56 to 0.95)	10 (6 to 71)
Severe neurodevelopmental delay in survivors§	0.71 (0.54 to 0.92)	9 (5 to 39)
Blindness in survivors	0.57 (0.33 to 0.96)	17 (9 to 232)
Deafness in survivors	0.76 (0.36 to 1.62)	NA

Edwards AD, BMJ 2010

Treatment Recommendations

Newly born infants born at or near-term with evolving moderate to severe hypoxic-ischemic encephalopathy should be offered therapeutic hypothermia.

Perlman JM et al. Pediatrics, 2010

Whole body cooling and selective head cooling are both appropriate strategies.

Perlman JM et al. Pediatrics, 2010

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AHA, AAP, Pediatrics 2010

Full-term infants

Studies: 5

Patients: 1762 full-term infants

Time of clamping (range) : 1 – 2,3 min

RESULTS: ↑ Iron status through early infancy

↑ Need for phototherapy

McDonald SJ, Cochrane Database 2008

Preterm infants

Studies: 10

Patients: 454 preterm infants

Time of clamping (range) : 30 sec–3 min

RESULTS:

↑ Circulating blood volume < 24 h

↓ Need for blood transfusions

↓ Incidence of IVH

↑ Need for phototherapy

Rabe H, Neonatology 2008

Treatment Recommendation

Delay in umbilical cord clamping for at least 1 minute is recommended for newborn infants not requiring resuscitation.

Perlman JM et al. Pediatrics, 2010

There is insufficient evidence to support or refute a recommendation to delay cord clamping in babies requiring resuscitation.

Perlman JM et al. Pediatrics, 2010

GUIDELINES: Major Changes

2005 vs 2010

- Personnel needs at elective cesarean section

- **Education**

AHA, AAP, Pediatrics 2006
AHA, AAP, Pediatrics 2010

Kory PD, Chest 2007

Treatment Recommendations

Simulation should be used as a methodology in resuscitation education. The most effective interventions and evaluation methodologies remain to be defined.

Perlman JM et al. Pediatrics, 2010

Grazie
per l'attenzione!