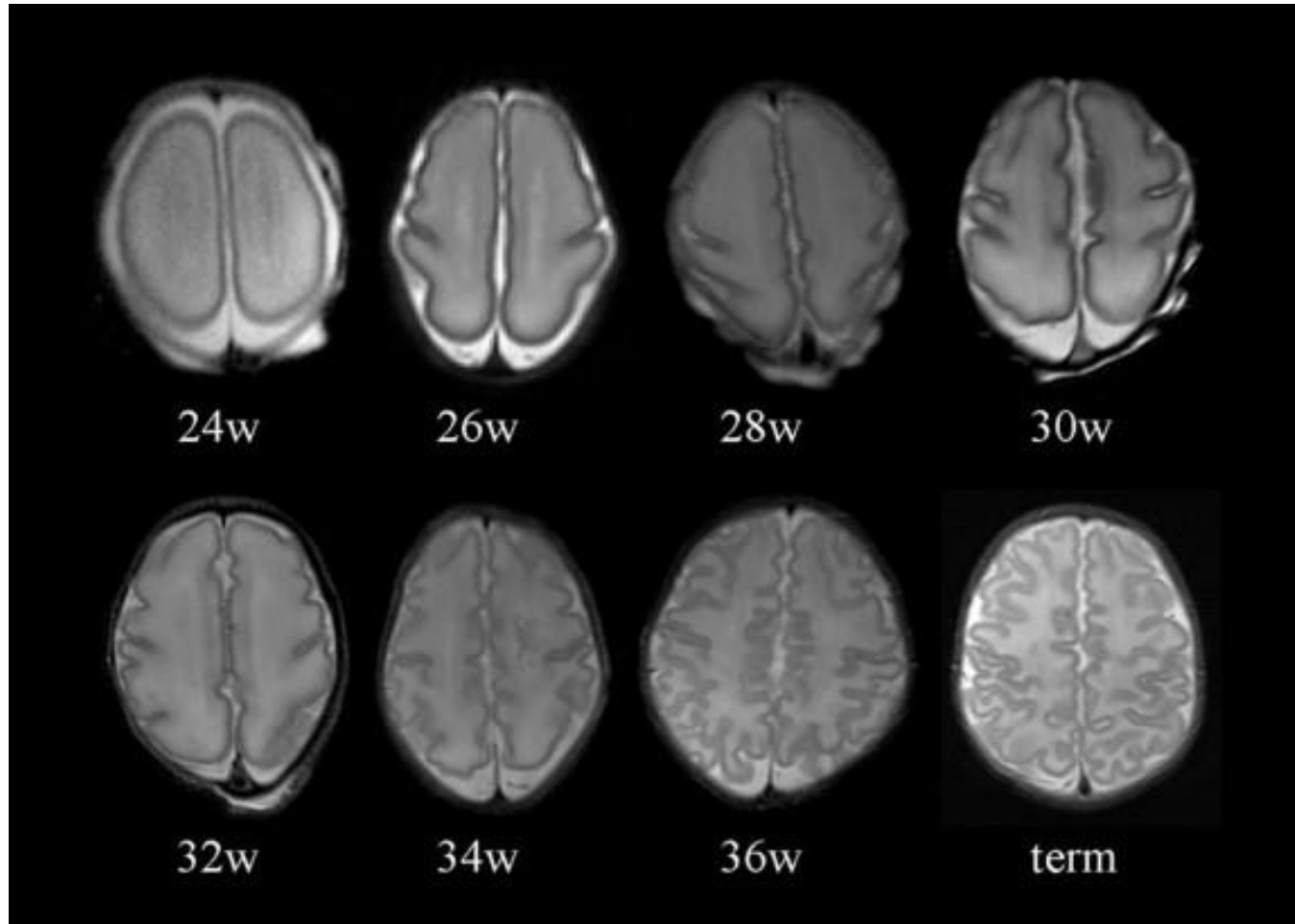
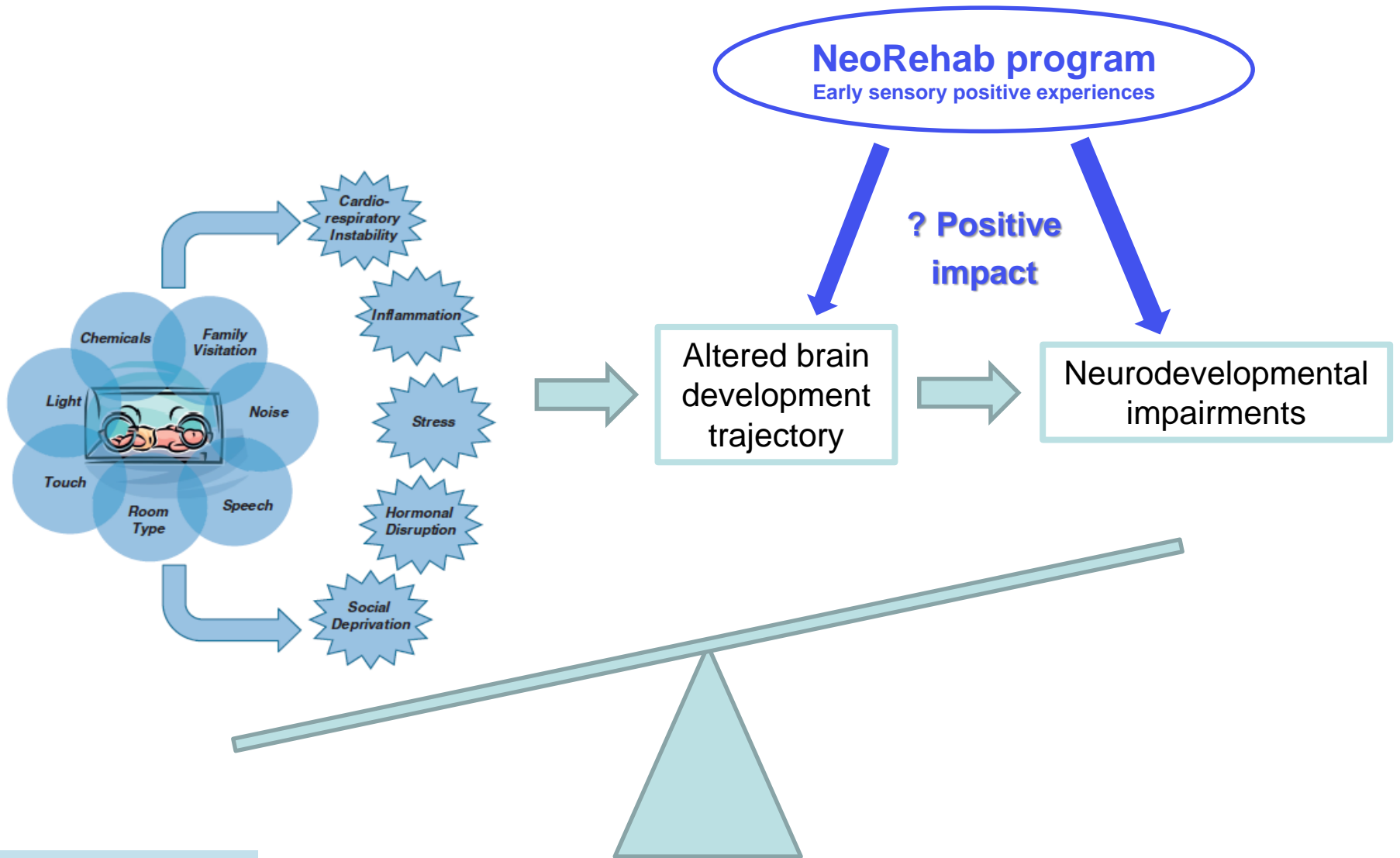


Brain development stages at time of intervention



Intervention concept



Vocal soothing

Physical therapy

Infant massage

Skin-to-skin care

Comforting touch

Scent exchange



Vocal Soothing

- Exposure to maternal voice is associated with:
 - ↓ Feeding intolerance
 - More stable oxygen saturation and HR
 - More time spent in quiet-alert state
- Exposure to parent speech > speech from other adults
- Adult word counts in the NICU is associated with higher
 - Language scores
 - Cognitive scores
 - Bayley IIIat 7 and 18-month

Scent Exchange

- Preterm infants exposed to maternal scent including maternal breast milk odor:
 - Demonstrate less distress and reduced crying
 - Lower PIPP scores after a heel stick

Aromatherapy for preemies: Cloths carrying scent of moms and dads help soothe NICU babies, promote bonding



PIPP (Premature Infant Pain Profile)

Comforting Touch

- Firm touch without stroking, rubbing, or passive movements
- For babies in distress
 - Gentle touch to provide gentle flexion and contain infant in fetal position
- Calming effect



Skin-to-Skin Care

- Kangaroo care
- Kangaroo mother care (KMC)
- Developed by Rey and Martinez (1983) in Bogotá, Columbia as a low-cost alternative to incubator care
 - Continuous skin-to-skin care (SSC)
- In resource rich setting:
 - Intermittent SSC
 - Part of routine care
 - Newborn nursery
 - NICU
 - Recommended by the AAP to ↓ pain associated with bedside procedures in the NICU



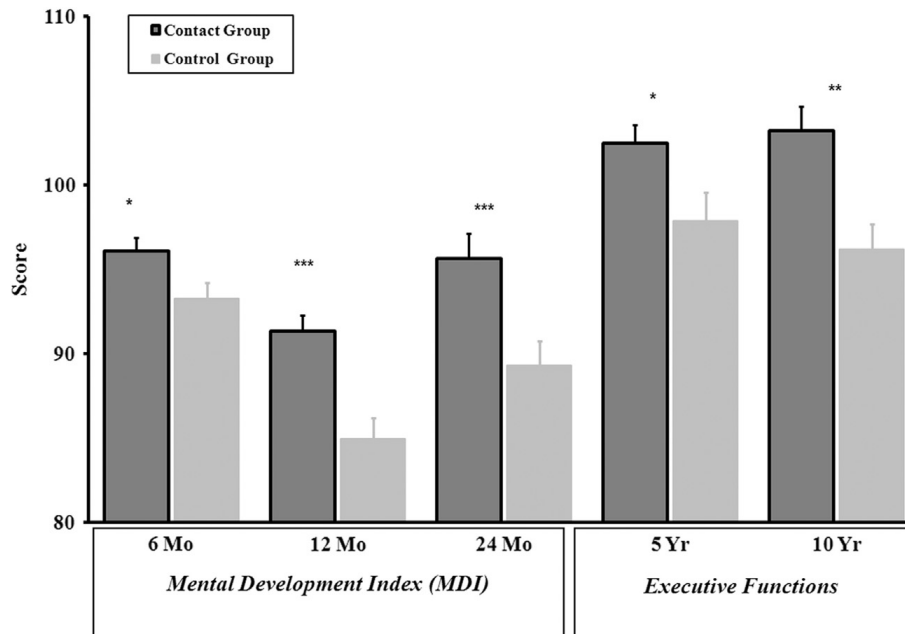
Skin-to-Skin Care

- ↓ Mortality (RR 0.67, 0.48-0.95)
- ↓ Severe infection/sepsis (RR 0.50, 0.36-0.69)
- KMC is associated with ↑ in:
 - Weight, length and head circumference gain
 - Exclusive breastfeeding
 - Quality of mother-infant bonding
 - ↓ Length of stay with early kangaroo mother care
 - Mean difference 0.9 days (0.6-1.2)
- No differences in psychomotor development at 12 months' CA (low-quality evidence)



Long-Term Benefits

- Case control study in Israel
 - 73 Preterm infants (30 weeks, GA 1250 g)
 - **KMC 1 hour daily for 14 consecutive days**
- SSC group:
 - ↑ Maternal attachment behavior in the postpartum period
 - ↓ Maternal anxiety
 - Enhanced child cognitive development from 6 to 24 months
 - Enhanced executive function at 5 and 10 years



Infant Massage

- Environmental enrichment
- 2 phases:
 - Tactile phase (slow sequential strokes)
 - Kinesthetic phase (sequential flexion/extensions)
 - Moderate pressure
 - \pm Oil

- \uparrow **Weight gain**
- \uparrow **Bone mineralization**
- Improved GI function
- Improved body fat deposition
- \downarrow **Infant stress**
- \downarrow Late-onset sepsis
 - Improved immune system
- \downarrow Jaundice
- Improved HR variability
- \downarrow Maternal depression and anxiety
- **Improved cognitive scores at 12 months corrected age**



Physical Therapy

- Improvement in short term weight gain and bone mineralization.
- Limited data on the impact of PT started before term equivalent age on long-term neurodevelopmental outcomes
- 1 RCT of parent-administered PT indicate short-term improvement in motor performance :
 - 153 infants \leq 32 weeks
 - PT intervention goals:
 - Promote postural control, head control, midline orientation
 - 10 min BID x 3 weeks from 34 to 36 weeks' CGA
 - Outcome measure: test of infant motor performance (TIMP) at 37 weeks

TABLE 2 Motor Performance in the Intervention and the Control Groups at Baseline and Postintervention

Variable	Intervention Group (n = 71)		Control Group (n = 79)		Between-Group Differences		P	Effect Size
	Mean	95% CI	Mean	95% CI	Mean	95% CI		
Baseline								
TIMPSI raw score	27.3	24.8 to 29.8	26.0	24.1 to 27.9				
TIMPSI z score	0.07	-0.19 to 0.34	-0.07	-0.27 to 0.13	0.14 ^a	-0.46 to 0.18	.394	
Postintervention								
TIMP raw score ^b	53.7	51.4 to 56.0	50.1	47.9 to 52.2				0.40 ^c
TIMP z score	0.21	-0.02 to 0.45	-0.18	-0.42 to 0.06	0.42 ^d	0.13 to 0.72	.005	