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Author, Year UI#	Demographics	Inclusion Criteria	Exclusion Criteria	Disease/Condition Type (N)	Study Design (Duration)
Leonard 1990 90204169	Location: US Years of Birth: 9/1/77- 9/1/82 Median GA (range), wk: 28.54±1.97 Mean BW (range), g: 1003±155 Male: 43% Race: ND Enrolled: 193 Evaluated: 129 Number of sites: 1	BW<1250 g Head CT between 5-6 days of life or head ultrasound days 3 and 10 after delivery	Died after discharge Lost to follow-up before reaching school age	VLBW infants (129): Without ICH (84), including 72 no parenting risk factor and 12 having parenting risk factor With ICH (45), including 38 no parenting risk factor and 7 having parenting risk factor	Prospective cohort (4.5 to 5 years)
Lucas 1992 92122860	Location: UK Years of Birth: 1982-1985 Mean GA: Sample 1: 31.4 ± 0.3 Sample 2: 31.4 ± 0.2 Mean BW: Sample 1: 1420 ± 30 Sample 2: 1440 ± 20 Males: Sample 1: 42% Sample 2: 55% Race: ND Enrolled: 313 Evaluated: 300 Number of sites: 5	Premature BW< 1850 g	ND	Sample 1: Preterms- no mother's milk (mother's choice not to provide breast milk to her infant within 72 hrs from delivery) [90] Sample 2: Preterms- mother's milk (mother's choice to provide breast milk to her infant within 72 hrs from delivery) matched with sample 1 for :BW, GA, need for ventilation, ds of NICU stay, other diets [210]	Prospective comparative longitudinal study (7.5-8 yrs)

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Author, Year UI#	Demographics	Inclusion Criteria	Exclusion Criteria	Disease/Condition Type (N)	Study Design (Duration)
Robertson 1994 94181384	Location: Canada Years of Birth: 1990 Median GA (range), wk: ND Mean BW (range), g: 500-1500 Male: ND Race: ND Enrolled: 241 Evaluated: 163 ? 157 Number of sites: 2	BW 500-1249 g, lived born in Alberta to Alberta parents	Corrected rates exclude infants with syndromes and / or CNS malformations Survived to 1- and 2- years of corrected age	VLBW infants survived to 1 year corrected age (163) ? survived to 2 year corrected age (157)	Retrospective cohort (at 1 year and 2 year corrected age)
Spinillo 1994 94257064 ***sample overlaps with Spinillo, 1997**	Location: Italy Years of Birth: 1983-1989 Median GA (range), wk: Sample 1: 33.4±3.4 Sample 2: 31.6±4.3 Sample 3: 32.7±5.1 Controls: 32.7±4.0 Mean BW (range), g: Sample 1: 1800±458 Sample 2: 1641±570 Sample 3: 1768±633 Controls: 1748±569 Male: ND Race: ND Enrolled: 87 Evaluated: 77 (154 controls) Number of sites: 1	Cases: LBW infants with diagnosis of abnormal antepartum bleeding in mother's pregnancy Controls: two liveborn LBW infants of similar GA and free of malformations born immediately after each case	ND	Cases: Sample 1: Abruptio Placentae (40) Sample 2: Placenta Previa (22) Sample 3: Unclassified reason for antepartum bleeding (vaginal and cervical polyps, excessive blood show, and cervical lacerations) Controls (154)	Prospective cohort (2 year)

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Author, Year UI#	Demographics	Inclusion Criteria	Exclusion Criteria	Disease/Condition Type (N)	Study Design (Duration)
Chen 1995 96009403	Location: Taiwan Years of Birth: 2/1990- 12/1991 Mean GA (range), wk: 30 (27-36) Mean BW (range), g: 1197 (625-1500) Male: ND Race: ND Enrolled: 74 Evaluated: 17 Number of sites: 1	VLBW preterm infants	ND	VLBW pretern infants (17): Group 1 - normal brain US (12) Group 2 - abnormal brain US (5, including 1 IVH grade I, 1 IVH grade III, and 3 PVL)	Prospective cohort (18-42 months) Left the hospital soon after birth at the request of their families (28) Families' refusal for further imaging studies (26 normal infants and 3 PVL infants)
Goetz 1995 96119489	Location: US Years of Birth: 1/1/1989 to 12/31/1992 Median GA (range), wk: ND Mean BW (range), g: 550-1100 Male: ND Race: ND Enrolled: 115 Evaluated: 14 Number of sites: 1	LBW < 1500 g Diagnosis of PVL	Death Transferred prior to being studied Not being followed-up	LBW infants with PVL (14)	Unclear (Retrospective or Prospective cohort, 11 months to 3 2/1 years)

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Author, Year UI#	Demographics	Inclusion Criteria	Exclusion Criteria	Disease/Condition Type (N)	Study Design (Duration)
Speechley 1995 96356544	Location: Canada Years of Birth: 1978-1980 Mean GA: Sample 1: 37 (28-43) Sample 2: 40 (37-44) Mean BW: Sample 1: 2790 (850-4550) Sample 2: 3503 (2660-5170) Male: Sample 1: 56% Sample 2: 50% Race: Sample 1: whites : 90% Sample 2: whites: 90% (Original study: was a randomized interventional study of having a family volunteer visit the home on a regular base for 6 months) Eligible (for the original study): 828 Enrolled (for the original RCT): 312 Evaluated (at 12 yrs): 253 Number of sites: 1	All infants born at a tertiary care hospital in Ontario Born between 1978-1980 Transferred to NICU or Normal Neonatal Nursery (NNN)	Family residence more than 120 Km from hospital Newborn's survival was in question Language barrier Refused to participate to the original RCT.	Sample 1: Former NICU graduates: [116] Sample 2: Former NNN graduates [137]	Prospective, longitudinal, comparative, observational study (12 yrs)

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Author, Year UI#	Demographics	Inclusion Criteria	Exclusion Criteria	Disease/Condition Type (N)	Study Design (Duration)
Wildin 1995 95385294 Wildin 1997 97422739 ***Data from same longitudinal study as Anderson, 1996 96314587 & Smith, 1996 97081985; overlapped sample**	Location: US Years of Birth: **1991-1992** Median GA (range), wk: Sample 1: 28.2±2.3 Sample 2: 30.8±2.2 Controls: 39.6±3.7 Median BW (range), g: Sample 1: 922±226 Sample 2: 1245±209 Controls: 3177±809 Male: Sample 1: 46% Sample 2: 42% Controls: 51% Race: African American Sample 1: 56% Sample 2: 56% Controls 3: 62% Enrolled: 370 Evaluated: 184 (114) Number of Setting: 2	(Sapme 1&2): BW< 1600g GA< 36wk Complete neurologic and developmental exams at 6 and 12 month corrected age. Controls: GA 37-42wks Apgar scores greater than 8 at 1 and 5 min Normal physical exam	"Significant" sensory impairment, meningitis, encephalitis, symptomatic congenital syphilis, congenital abnormality of brain, short bowel, HIV positive mother Primary care giver< 16y/o, drug abuser or did not speak English	Cases: preterm LBW infants (184): Sample 1: High risk (HR) (69) Sample 2: Low risk (LR) (115) Controls: Full Term (114)	Prospective cohort (at 6, and 12 months of age)

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Author, Year UI#	Demographics	Inclusion Criteria	Exclusion Criteria	Disease/Condition Type (N)	Study Design (Duration)
Anderson 1996 96314587 Smith 1996 97081985 (CNS+All) ***Data from same longitudinal study (U. of Texas Health Sciences Center in Houston and the U. of Texas Medical Branch in Galveston) as Wildin, 1995 & 1997; overlapped sample**	Location: US Years of Birth: **1990-1992** Median GA (range), wk: Sample 1: 28.2±2.3 Sample 2: 30.8±2.2 Controls: 39.6±3.7 Mean BW (range), g: Sample 1: 922±226 Sample 2: 1245±209 Controls: 3177±809 Male: 50% Race: African American: Sample 1: 57% Sample 2: 62% Controls: 62% Caucasian: Sample 1: 25% Sample 2: 20% Controls: 25% Hispanic: Sample 1: 13% Sample 2: 15% Controls: 13% Other: Sample 1: 5% Sample 2: 3% Controls: 0% Enrolled: 368 Evaluated: 212 (128 controls) Number of sites: 2	(Sample 1&2): VLBW (<1600g) and GA<36 wk Female primary care giver completed both a 6 and 12 month home visit Controls: FT infants examined at 6 and 12 month corrected age	Infants with maternal substance abuse, major dysmorphisms, chromosomal anomalies, sensory impairment, meningitis, encephalitis, congenital syphilis, congenital abnormality of brain, cardiac abnormalities, NEC or HIV antibody positive Primary caregiver age < 16, drug abuser or not English-speaking (only in Smith, 1996)	Sample 1: High risk VLBW (89) Sample 2: Low risk VLBW (123) Controls: Full term (128)	Prospective cohort (6 and 12 months)

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Author, Year UI#	Demographics	Inclusion Criteria	Exclusion Criteria	Disease/Condition Type (N)	Study Design (Duration)
Kato 1996 97182916	Location: Japan Years of Birth: 1984-1993 Median GA (range), wk: 28±2.8 Mean BW (range), g: 1031.3±271.7 Male: 48% Race: ND Enrolled: 305 Evaluated: 228 Number of sites: 2	VLBW singletons	Major anomaly Multiple gestation	VLBW infants (228)	Retrospective cohort (> 12 months)
Katz 1996 97145056	Location: UK Years of Birth: 5/83- 4/85 Median GA (range), wk: 29.2±2.5 (26-34) Mean BW (range), g: 1227.5±341.4 (740-2240) Male: Cases: 52% Controls: 55% Race: Cases: 75% White, 19% Black, 6% Asian Controls: 75% White, 12.5% Black, 12.5% Asian Enrolled: 212 Evaluated: 64 (40 controls) Number of sites: 2	≤34 weeks, no major congenital anomaly, 3 cranial u/s in first week of life	Lost to follow-up Too impair due to multiple cognitive, sensory, or motor disabilities, to complete testing	Cases: Preterm infants (64) Controls: Full-term comparison sample (40)	Prospective cohort (6-8 years)

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Author, Year UI#	Demographics	Inclusion Criteria	Exclusion Criteria	Disease/Condition Type (N)	Study Design (Duration)
Korkman 1996 96374730 Psy1996	Location:Finland Years of Birth: ND Mean GA: Sample 1: 30.8 ± 2.25 Sample 2: 28.8 ± 1.41 Sample 3: 39.7 ± 1.98 Sample 4: 40.0 ± 0.77 Mean BW: Sample 1: 1068.5 ± 151.2 Sample 2: 1212.2 ± 189.3 Sample 3: 3596.7 ± 705.0 Sample 4: 3469.9 ± 275.9 Males: Sample 1: 44% Sample 2: 49% Sample 3: 42% Sample 4: 55% Race: ND Enrolled: ND Evaluated: 158 Number of sites: 2	Born at OB/GYN dept of Univ Helsinki F/up at Children's Hospital and Children's Castle Hospital Had neuropsychological assessment between 5yrs-9 yrs. And specifically for each sample: Sample 1: VLBW: less than 1500 g And SGA (at least 2 SD below mean for their GA) Sample 2: VLBW and AGA Sample 3: Asphyxiated Term infants, GA> 34 weeks with: Umbilical arterial ph<7.05 Or Apgar scores at 5 min less than 6 (From a Birth Cohort of 982 deliveries that included all the term asphyxiated infants) Sample 4: Healthy term with normal delivery, AGA (within 1.5 SD), Umbilical artery pH: 7.18 or more Apgar score 1 min: 8 or more Neonatal period: uneventful Born in the same hospital from healthy mothers by a singleton uncomplicated pregnancy	Children with : Cerebral Palsy Mental retardation Visual impairment	Sample 1: VLBW and SGA [34] Sample 2: VLBW and AGA [43] Sample 3: Birth asphyxia group of term infants [36] Sample 4: Control Group [45]	Prospective comparative longitudinal study (5-9 yrs) (mean age: sample 1: 7.1 yrs, sample 2: 7.3 yrs, sample 3: 6.9 yrs, sample 4: 6.11 yrs)

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Author, Year UI#	Demographics	Inclusion Criteria	Exclusion Criteria	Disease/Condition Type (N)	Study Design (Duration)
Lucas 1996 96302121	Location: US Years of Birth: 1988- 1991 Median GA (range), wk: Sample 1: 29.8±0.2 Sample 2: 29.8±0.2 Mean BW (range), g: Sample 1: 1306±28 Sample 2: 1263±26 Male: Sample 1: 47% Sample 2: 47% Race: ND Enrolled: 275 Evaluated: 275 Number of sites: 2	Breast feeding BW<1850; GA< 37, Survived to randomization at 48-72 hr; Received any breast milk	Not resident in UK and the present major congenital abnormalities (e.g. trisomy) known to influence neurodevelopment	Sample 1: Fortified breast milk (137) Sample 2: Minimally supplemented breast milk (138)	RCT (9 and 18 months)

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Author, Year UI#	Demographics	Inclusion Criteria	Exclusion Criteria	Disease/Condition Type (N)	Study Design (Duration)
Rieck 1996 Psy 1996 06905005	Location: Israel Years of Birth: ND Mean GA: ND Mean BW: ND Males: ND Race: Sample 1: whites 90%, asian-african10% Sample 2: whites: 94%, Asian-African: 5% Enrolled: Sample 1,2,3 : ND Evaluated: Sample 1: 103 Sample 2,3: ND Number of sites: ND	Sample 1: Premature VLBW < 1500 g Sample 2:: Children from middle socioeconomic class (MC) families Sample 3: Children from low socioeconomic class (LC) families	ND	Prospective longitudinal component: Sample 1: Premature VLBW <1500) [83] (mean age at assessment: 4.5 yrs) Cross-sectional comparative component: Sample 1 Premature VLBW < 1500 [83] Sample 2: Term children of middle class families [71] Matched with sample 1 only for mean age at assessment : 5.1 yrs Sample 3: Term children from low Class families [322] Matched with sample 1 only for mean age at assessment: 5.0 yrs	Longitudinal f/up study of children participating in a previous prospective longitudinal study (3-7 yrs) Cross sectional comparative component (3 arms: 2 control arms) (3- 7 yrs)

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Author, Year UI#	Demographics	Inclusion Criteria	Exclusion Criteria	Disease/Condition Type (N)	Study Design (Duration)
Whitaker 1996 97040639	Location: US Years of Birth: 9/1/84-6/30/87 Median GA (range), wk: 31.5 Median BW (range), g: 1480.7 Male: 51% Race: White 74%, African-American 22%, Other 5% SES: middle class (19% of the families receiving public assistance) Enrolled: 685 Evaluated: 597 Number of sites: ND	BW 501-2000 g Survived to 6 years of age and participated in the study Home visit interview subjects	Families refusal (45) Unable to be located (143) Had been adopted (25)	Central New Jersey Neonatal Brain Hemorrhage study cohort LBW infants (597): Normal US finding (468) GM/IVH (83) PL/VE (46)	Prospective cohort (6 years)
Blitz 1997 97154301	Location: US Years of Birth: 1/90- 8/90 Mean GA (range), wk: 26.5±2.4 Mean BW (range), g: 775.9±138.4 Male: 36% Race: 40% White Enrolled: 248 Evaluated: 100 Number of sites: 1	Preemies, BW< 1001 g Maryland residents	Survived to hospital discharge Declined participation Serious congenital malformations, genetic disorder, diagnosed congenital syndromes with brain abnormality of known correlation with developmental disability, disorders secondary to prenatal toxic exposure with microcephaly, severe head injury after discharge Developed meningitis after discharge	ELBW preemies (100): Meningitis 6% PVL 10% Hydrocephalus 18% Seizures 7% IVH = grade III 26% BPD 63% ROP 49% Retinopathy of prematurity 49%	Prospective cohort

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Author, Year UI#	Demographics	Inclusion Criteria	Exclusion Criteria	Disease/Condition Type (N)	Study Design (Duration)
Cheung 1997 97310950	Location: Canada Years of Birth: 1988-1993 Median GA (range), wk: 26 (24-30) Mean BW (range), g: 891 (530-1180) Male: 67% Race: ND Enrolled: 52 Evaluated: 21 Number of sites: 1	Preterm neonates (GA < 30 weeks, BW < 1200 g) with severe respiratory failure treated with high frequency ventilation (HFO)	ND	Preterms with IVH (21)	Retrospective cohort
Ekert 1997 97251211	Location: Canada Years of Birth: 1988-1994 Median GA (range), wk: 27.6±2.1 Mean BW (range), g: 962±262g Male: 50% Race: ND Enrolled: 123 Evaluated: 123 Number of sites: 2	GA<32 wks informed parental consent	Congenital anomalies, meningitis, congenital infections, GBS disease, lack of consent	Patients entering study (123)→ 104 left in analysis for outcome studies	Prospective cohort (seen at corrected age 4,8,12,18,24 months)

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Author, Year UI#	Demographics	Inclusion Criteria	Exclusion Criteria	Disease/Condition Type (N)	Study Design (Duration)
Gerner 1997 97329414	Location: Sweden Years of birth: 1988-1993 Mean BW: 1047 ±258 g Mean GA: 28.2 ±2.7 wks Males: ND Race: ND Enrolled: Sample 1 and 2: 211 Sample 3: ND Evaluated: Sample 1: 50 Sample 2: 121 Sample 3: 35 Number of sites: 2	Sample 1 and 2: Premature,VLBW infants<15000g From NICU of Karolinska Hospital and St Goran's Hospital in Stockholm Born between 9/1988 and 2/1993. Inborns and outborns included Had neurodevelopmental assessment at 10 months corrected age Sample 3: Full term infants Uneventful pregnancy and delivery Apgar score at 5 min: 10 No neonatal complications Born at Karolinska hospital During the same period Matched with cases for: sex, maternal age, maternal education and parity Had neurodevelopmental assessment at 10 months corrected age	ND	Sample 1: Preterm VLBW infants "healthy" without any risk factors [50] Sample 2: Preterm VLBW infants With one or more risk factors [Brain hemorrhage, white matter lesion, surgical closure of PDA, ventilator treatment or septicemia (except Staph epi) [121] (Risk factors and group definition were based on the risk factors that were statistically significantly correlated with outcome in the cohort of the 171 preterm VLBW infants) Sample 3: Full term " healthy" infants, born at Karolinska hospital, during the same period, and matched with the combined preterm VLBW cohort [35]	First component: Prospective observational cohort with 171 preterm VLBW infants (sample 1 and 2) Second component: Prospective comparative component : sample 1 vs sample 3 Third component: Prospective Comparative component: Sample 2 vs sample 1 [10 months]

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Author, Year UI#	Demographics	Inclusion Criteria	Exclusion Criteria	Disease/Condition Type (N)	Study Design (Duration)
Koller 1997 97193708	Location: US Years of Birth: 1975-1989 Median GA (range), wk: 30.9 (25-37) Mean BW (range), g: 117±227 Male: 45% Race: 51% Black Enrolled: 203 Evaluated: 203 Number of sites: 3	GA <1500, data obtained at 4 follow-up data points	ND	VLBW infants (203)	Retrospective cohort
Murphy 1997 97192793	Location: Korea Years of Birth: 1984-1990 Median GA (range), wk: Cases: 28.6±2.3 (24-32) Control: 29.9±1.9 (23-32) Median BW (range), g: ND Male: Cases: 63% Control: 57% Race: ND Enrolled: 638 Evaluated: 59 (234 controls) Number of sites: 1	GA<32 weeks Singleton Oxfordshire and West Berkshire resident Neonatal notes were available	Multiple birth Died before discharged	Cases: CP cases (59) Controls (234)	Case-control study

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Author, Year UI#	Demographics	Inclusion Criteria	Exclusion Criteria	Disease/Condition Type (N)	Study Design (Duration)
Schendel 1997 98033417	Location: US Years of Birth: 12/1/89 to 3/31/91 Mean GA (range), wk: Sample 1: 28.4 ±3.0 Sample 2: 35.6 ±2.8 Controls: 39.4 ±1.5 Mean BW (range), g: Sample 1: 1088±268 Sample 2: 2184±267 Controls: 3417±432 Male: Sample 1: 49% Sample 2: 46% Controls: 52% Race: Black Sample 1: 37% Sample 2: 37% Controls: 41% Enrolled: 920 (555 controls) Evaluated: 920 (555) Number of sites: 5	Singleton livebirths in MMIHS study population, survived to 1 year of age Cases: MLBW infants, BW 1500-2499g; VLBW infants, BW<1500g Controls: NBW infants randomly selected from the birth certificate files on the basis of frequency matching with cases by maternal race, age, and residence	ND	Sample 1: VLBW infants (367) Sample 2: MLBW infants (553) Controls: NBW infants (555)	Case-control study
Thompson 1997 97268338	Location: US Years of Birth: : 1986-1991 Median GA (range), wk: 28.36±2.11(24-33) Mean BW (range), g: 1100±2.11 (700-1500) Male: 46% Race: ND Enrolled: 111 Evaluated: 55 Number of sites: 1	Born at Duke BW<1500g Survived to discharge or to 6 mo. corrected age	ND	VLBW infants (55)	Prospective cohort (4 years) Death (12), lost to follow-up (34), incomplete data (4), invalid score (5)

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Author, Year UI#	Demographics	Inclusion Criteria	Exclusion Criteria	Disease/Condition Type (N)	Study Design (Duration)
Victorian Infant Collaborative study Group 1997 98026322 ***There are a series of Victorian articles in LBW-ALL.** ***This study will be combined in LBW-ALL table**	Location: Australia Years of Birth: 1979-80, 1985-87, 1991-92 Median GA (range), wk: ND Mean BW (range), g: ND Male: ND Race: ND Enrolled: 453 (242 controls) Evaluated: 448 (242) Number of sites: 3	(Sample 1-3): ELBW infants, BW 500-999 g born in Victoria, Australia Survived to age of 2 years Controls: Normal birth weight (>2499 g) infants born in 1991-1992	Excluded infants born in 1979-1980 for current review	Cases: ELBW infants (448): Sample 1: born in 1985-1987 (212) Sample 2: born in 1991-1992 (241) Controls: Normal BW (>2499 g) infants (242)	Retrospective cohort
Battin 1998 99002694	Location: British Columbia, Canada Enrollment period: 1991-1993 Mean GA: ND (range: 23-25 wks) Mean BW: ND (Mean BW for the 333 live births during the study period : for GA of 23 wks: 581, for GA of 24 wks: 648, for GA of 25 wks: 764) Male: ND Race: ND Enrolled: 333 (total live births GA: 23-28 wks) Evaluated : 44 (out of 49 of GA 23-25 surviving to NICU discharge) Number of sites: 2	Prospective cohort: Birth at British Children's Hospital and British Womens' Hospital Born during 1991-1993 Extremely low gestational age (ELGA): 23-25 wks Had follow up at 18 mo of age Historical control group: Born at the same institution Born between 1983-1989 GA: 23-25 wks	Cases of therapeutic termination of pregnancies for lethal congenital anomalies Outborns	Prospective cohort of ELGA born during a period when antenatal steroids, surfactant and dexamethasone for BPD had become an accepted treatment [44]	Prospective observational cohort study and a comparative study with an historical control group (18 months)

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Author, Year UI#	Demographics	Inclusion Criteria	Exclusion Criteria	Disease/Condition Type (N)	Study Design (Duration)
Bos 1998 98218970	Location: Netherlands Years of Birth: 1992-1994 Mean GA (range), wk: 26-34 Mean BW (range), g: 835-1780 Male: ND Race: ND Enrolled: 27 Evaluated: 27 Number of sites: ND	AGA GA <35 wks Lived within 60km of hospital Normal US findings	Major congenital anomalies Developed cystic PVL, or grade 3 or 4 IVH	Preterm infants with echodensities (27)	Prospective cohort
Cherkes-Julkowski 1998 98262696	Location: ND Years of Birth: ND Mean GA (range), wk: ND Mean BW (range): Cases: 4.14±1.87 lbs Controls: 7.30±1.87 lbs Male: Cases: 61% Controls: 50% Race: ND SES: "middle class" Enrolled: 48 Evaluated: 28 (20 controls) Number of sites: 1	Preterm: <38 wks, BW<5 lbs, no congenital disorders, no retrolenteal fibroplasia, discharge from hospital prior to 42 wks conceptional age, mother willing to participate Controls: participants were enrolled in a longitudinal study before their second month of age	ND	Preterms (28) Controls: full term infants (20)	Retrospective cohort

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Author, Year UI#	Demographics	Inclusion Criteria	Exclusion Criteria	Disease/Condition Type (N)	Study Design (Duration)
Emsley 1998 98238139 (CNS+ All)	Location: US Years of Birth: 1984 to 1994 Median GA (range), wk: Sample 1: 24.5 Sample 2: 24.2 Mean BW (range), g: Sample 1: 751.7 Sample 2: 697.1 Male: Sample 1: 67% Sample 2: 55% Race: ND Enrolled: 192 Evaluated: 64 Number of sites: 2	GA 23-25 weeks	Survived until discharge	Sample 1: Cohort 1 Born 1984-1989 (24) Sample 2: Cohort 2 born 1990-1994 (40)	Prospective cohort (3.3 –10.6 years)
Pasman 1998 98196839	Location: Netherlands Years of Birth: ND Median GA (range), wk: Sample 1: 28.9±1.5 (25-30) Sample 2: 32.5±1.1 (31-34) Sample 3: Sample 4: 30.1±1.6 (25-34) Controls: 39.4±1.5 (38-42) Mean BW (range), g: Sample 1: 1071±269 Sample 2: 1568±351 Sample 3: Sample 4: 1317±299 Controls: 3144±516 Male: ND Race: ND Enrolled: 81 (25 controls) Evaluated: 45 (18 controls) Number of sites: 2	GA=25-34 weeks, admitted to university hospital	Dysgenetic brain lesions Major congenital anomalies Clinical syndromes Lost to follow-up	Sample 1: Early preterms, low risk (15) Sample 2: Late preterms, low risk (21) Sample 3: Early high risk preterms (8) Sample 4: Late high risk preterms (9) Controls: Full term (18)	Prospective cohort (followed to 5-7 years age)

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Author, Year UI#	Demographics	Inclusion Criteria	Exclusion Criteria	Disease/Condition Type (N)	Study Design (Duration)
Redline 1998 99086405	Location: US Years of Birth: 1983-1991 Median GA (range), wk: Sample 1: 27.3 ±2.3 Sample 2: 27.5 ± 2.2 Mean BW (range), g: Sample 1: 978± 228 Sample 2: 1012±226 Male: ND Race: African-American Sample 1: 57% Sample 2: 59% Enrolled: 72 Evaluated: 60 (59 controls) Number of sites: 2	Cases (Sample 1&2): Infants with major neurologic impairment at 20 months (strictly defined CP, loosely defined CP, hypertonia, Hypotonia) and those with NL neurologic exam at 20 months. Controls: infants born in the same year and matched for weight (±250 g), GA (±2 weeks), race, and sex who had a normal neurologic examination at 20 months.	No placental reports and slides available	Cases: VLBW infants with major neurologic impairment at 20 months (60) Sample 1: Strict CP (42) Sample 2: Neurologic abnormalities (18) Controls (59)	Case-control (at 20 months corrected age)
Rogers 1998 98438124	Location: US Years of Birth: 1988 to 1993 Median GA (range), wk: Sample 1: 27.9 ±2.0 Sample 2: 27.6 ±1.8 Mean BW (range), g: Sample 1: 1158±330 Sample 2: 1082± 290 Male: ND Race: ND Enrolled: 41 Evaluated: 41 Number of sites: 1	GA < 33 weeks live birth with unspecified IVH	ND	Sample 1: No growth failure (23) Sample 2: Growth failure (18)	Retrospective cohort

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Author, Year UI#	Demographics	Inclusion Criteria	Exclusion Criteria	Disease/Condition Type (N)	Study Design (Duration)
Spinillo 1998 98237382 Spinillo, 1997 98021316 & 97277958 ***have some overlapped sample with spinillo, 1994**	Location: Italy Years of Birth: 1987 to 1993 Median GA (range), wk: Cases: 29.6 Controls: 30.5 Mean BW (range), g: Cases: 1317 Controls: 1451 Male: 52% Race: ND Enrolled: 461 Evaluated: 345 Number of sites: 2	GA 24–33 completed weeks Had a US scan done before 20 weeks' gestation	Severe malformations or chromosome abnormalities	Sample 1: Preterm infants with CP (40) Sample 2: Preterm infants without CP (305)	Prospective cohort (3, 6, 12, and 24 months)
Tin 1998 99046171	Location: North of England Years of Birth: 1983, 1990-1991 Median GA (range), wk: ND Mean BW (range), g: ND Male: ND Race: ND Enrolled: 1983 (230); 1990-1 (566) Evaluated: 1983 (230); 1990-1 (566) Number of sites: 5	GA 23-31 weeks	ND	1983 cohort (230): Child reviewed without difficulty (204) Child traced with difficulty (14) Child seen with difficulty after child was traced (12) 1990 to 1991 (566): Child reviewed without difficulty (505) Child traced with difficulty (26) Child seen with difficulty after child was traced (35)	Prospective cohort *2 Cohorts of different time periods

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Author, Year UI#	Demographics	Inclusion Criteria	Exclusion Criteria	Disease/Condition Type (N)	Study Design (Duration)
Burguet 1999 99126269	Location: France Years of Birth: : 10/1/90- 9/10/92 Mean GA (range), wk: 25-32 Mean BW (range), g: 8% BW>2000g Male: 51% Race: 86% Caucasian SES: 5% Family precariousness Enrolled: 203 Evaluated: 167 Number of sites: 20	All liveborn premature in 20 maternity hospitals in Franche-Comte region	Chromosomal or neurological congenital anomaly diagnosed in the neonatal period, discordance of 2 wks or more between pediatric and obstetrical or echographic determination of gestational age, triplets and more	Preemies (167): RDS 40% No RDS 60%	Prospective (93%) and retrospective (7%) cohort (followed until 2 years of age)
Cooke 1999 99257637	Location: UK Years of Birth: 1982-1993 Median GA (range), wk: ND Mean BW (range), g: ND Male: ND Race: ND Enrolled: 1722 Evaluated: 1187 Number of sites: 1	VLBW (not specifically defined) Have data at 3 years old	ND	VLBW infants (1187): 1982-19855 (411) 1986-1989 (387) 1990-1993 (398)	Retrospective cohort (followed until 3 years corrected age)
Cooke 1999 99380719	Location: UK Years of Birth: 1982-1993 Median GA (range), wk: 28.6±1.7 (24-35) Mean BW (range), g: 1103±203 (630-1500) Male: ND Race: ND Enrolled: 137 Evaluated: 87 (8 controls) Number of sites: 1	VLBW infants prospectively followed birth to age 13 with MRIs between age 15-17 yrs Controls: FT infants	ND	VLBW infants (87), with white matter disorder, PVL, Ventriculomegaly, MRI abnormality Controls: FT infants (8)	Prospectively cohort (15-17 years)

Evidence Table 3. Studies Evaluating Association of LBW and Cerebral Palsy and Neurological Outcomes
Part I

Author, Year UI#	Demographics	Inclusion Criteria	Exclusion Criteria	Disease/Condition Type (N)	Study Design (Duration)
Finer 1999 99436635	Location: UK Years of Birth: 1/1/94 to 12/31/96 Median GA (range), wk: 25 (24-28) Mean BW (range), g: 663 (440-968) Male: 50% Race: ND Enrolled: 177 Evaluated: 10 (10 controls) Number of sites: 1	Cases: Inborn infants BW < 1000g Received DR-CPR Survived until discharge Controls: Matched controls with similar mean BW and length of follow-up	Lethal congenital malformations	Cases: ELBW survived infants received DR-CPR (10) Controls (10)	Retrospective cohort (median 28 months)
Futagi 1999 99450356	Location: Japan Years of Birth: 1981-1986 and 1989 1993 Mean GA: Sample 1: 27.2±2.2 Sample 2: 26.8±2.4 Mean BW: Sample 1: 834.1±133.4 Sample 2: 786.0±133.2 Males: Sample 1: 38% Sample 2: 53% Race: ND Enrolled: 305 Evaluated: 276 Number of sites: 1	Presurfactant era cohort: BW less than 1000 gms Admitted to NICU Born during presurfactant era 1981-1986 Follow up for at least 3 years. Neurodevelopmental and Mental outcome documented in medical records Surfactant era cohort: same as above except Born during surfactant era, 1989-1993	Hereditary disorders Chromosomal abnormalities Follow up less than 3 years Absence of documentation of neurodevelopmental or mental outcome in medical records	Sample 1 Presurfactant cohort: Born during presurfactant era, between 1981-86 [107] Sample 2: Surfactant era cohort: Born during surfactant era, between 1989-1993 [169]	Retrospective comparative longitudinal study. Comparison done between 2 retrospective cohorts (pre-surfactant era cohort vs surfactant era cohort) [3-8.8 years, mean f/up: 6.0 ±1.3 yrs (not given per group)]

Evidence Table 3. Studies Evaluating Association of LBW and Cerebral Palsy and Neurological Outcomes
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Author, Year UI#	Demographics	Inclusion Criteria	Exclusion Criteria	Disease/Condition Type (N)	Study Design (Duration)
Kim 1999 99416608	Location: UK Years of Birth: July 1996 to November 1997 Median GA (range), wk: Cases: 30.8±3.5 Control: 31.4± 2.2 Mean BW (range), g: Cases: 1557±252 Control: 1418±376 Male: Cases: 47% Control: 52% Race: ND Enrolled: 184 Evaluated: 17 (62 controls) Number of sites: ND	Preterm (GA<37 wks) infants and term infants with an Apgar score of less than 6 at 5 minutes, neonatal hyperbilirubinemia (total bilirubin concentration of 20 mg/dl or more) and bacterial meningitis BW<2000 g	Chromosomal abnormalities and congenital malformation	Cases: VLBW infants with CP or Developmental D (17) VLBW Controls (62)	Prospective cohort (at 2, 6, 12 months corrected age)
Krageloh-Mann 1999 99431017	Location: Denmark Years of Birth: 1986- 1989 Median GA (range), wk: 30.2 (27-34) Mean BW (range), g: 1461 (690-2655) Male: 66% Race: ND Enrolled: 40 Evaluated: 29 (57 controls) Number of sites:1	Preterm infants	Death (1), lost to follow-up (7), parental refusal (4), difficulties with sedation for MRI (1)	Cases: preterm infants (29) Controls: term-born pre-school children (57)	Prospective cohort

Evidence Table 3. Studies Evaluating Association of LBW and Cerebral Palsy and Neurological Outcomes
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Author, Year UI#	Demographics	Inclusion Criteria	Exclusion Criteria	Disease/Condition Type (N)	Study Design (Duration)
Salokorpi 1999 99353226	Location: Finland Years of Birth: 1991 to 1994 Median GA (range), wk: Sample 1: 26.7 ±2.0 Sample 2: 26.7 ±2.4 Mean BW (range), g: Sample 1: 833±130 Sample 2: 817± 130 Male: Sample 1: 33% Sample 2: 46% Race: ND Enrolled: 228 Evaluated: 143 Number of sites: 1	Premature infants, BW < 1000 g, admitted to NICU	ND	Sample 1: CP present (27) Sample 2: CP absence (116)	Prospective cohort Lost to follow-up (13) due to parent refusal or because had moved to remote areas Died by the age of 2 year (72)
Shepherd 1999 99165413	Location: Scotland Years of Birth: 2/95 to 2/97 Median GA (range), wk: 25.7-35 Mean BW (range), g: 570-3200 Male: ND Race: ND Enrolled: 81 (68 controls) Evaluated: 81 (68) Number of sites: 1	Preterm infants admitted to the special-care unit	Genetic or prenatal anomalies	Cases: preterms (81) Controls: term infants (68)	Prospective cohort

Evidence Table 3. Studies Evaluating Association of LBW and Cerebral Palsy and Neurological Outcomes
Part I

Author, Year UI#	Demographics	Inclusion Criteria	Exclusion Criteria	Disease/Condition Type (N)	Study Design (Duration)
Stathis 1999 99325758	Location: Australia Years of Birth: :1977-1986 Median GA (range), wk: 27.7(27.3-28.1) Mean BW (range), g: 860 (837-833) Male: 36% Race: ND Enrolled: 124 Evaluated: 87 Number of sites: 1	BW 500-999g survived to discharge Cared for in study NICU Enrolled in follow-up programs	ND	ELBW survived infants (87)	Prospective cohort (followed at 4, 8, 12, months)
Vohr 1999 99332101	Location: US Years of Birth: 1989-1992 Median GA (range), wk: Sample 1: 27.9±2 Sample 2: 28±2 Mean BW (range), g: Sample 1: 960±178 Sample 2: 965±179 Male: Sample 1: 59% Sample 2: 56% Race: Sample 1: Black 21%, Hispanic 3%, White 76% Sample 2: Black 20%, White 78%, Other 2% Enrolled: 392 Evaluated: 278 Number of sites: 3	BW 600-1250g Survived the first 3 years of life, and were seen for neurodevelopmental follow-up at 36 months CA	Non-English speaking home	Sample 1: Early IVH positive (29) Sample 2: Early IVH negative (249)	Unclear (Retrospective or prospective cohort, followed to 36 months corrected age)

Evidence Table 3. Studies Evaluating Association of LBW and Cerebral Palsy and Neurological Outcomes
Part I

Author, Year UI#	Demographics	Inclusion Criteria	Exclusion Criteria	Disease/Condition Type (N)	Study Design (Duration)
Agustines 2000 20279724	Location: US Years of Birth: 1990-1995 Median GA (range), wk: 25 (24-29) Median BW (range), g: 674 Male: ND Race: ND Enrolled: 63 Evaluated: 36 Number of sites: 1	BW: 500-750 g Born in Long Beach Hospital, between 1990 and 1995 (post corticosteroid, postsurfactant era) Survived to discharge Had follow up at 30 months	ND	VLBW infants (36)	Retrospective cohort (followed to 30 months CA) Lost to follow-up (27)
Breslau 2000 20298367	Location: US Years of Birth: 1983-1985 Mean GA (range), wk: ND Mean BW (range), g: ND Male: ND Male: ND Race: Sample 1 (urban) Blacks: 80% Sample 1 (suburban) Blacks:11% Sample 2 (urban) Blacks:74% Sample 2 (suburban) Blacks: 3% Enrolled: 1095 Evaluated: 823→717 Number of sites: ND	LBW cohort: <2500 g NBW cohort: Born between 1983-85, that were 6 yrs old during 1990-92; when the fieldwork took place From 2 major hospitals of South Michigan: one urban and one suburban (In each hospital, random samples of LBW and NBW children were drawn).	From the target sample: were excluded children with severe neurologic impairment: CP, MR, blindness From the analysis of incidence of severe attention problems were excluded children that already had severe attention problems at the assessment at 6 yrs	At 11 yrs (717): Sample 1: LBW (411) – Urban LBW (217) Suburban LBW (194) Sample 2: NBW (306) - Urban NBW)164) Suburban NBW (142)	Prospective cohort (11 years)
Buhrer 2000 20280896	Location: Germany Years of Birth: 1/192- 12/31/97 Mean GA (range), wk: 28.7 (23.2-37.2) Mean BW (range), g: 1149 (430-1495) Male: ND Race: ND Enrolled: 455 Evaluated: 352 Number of sites: 1	VLBW, BW < 1500 g	ND	VLBW infants (352)	Prospective cohort (followed until 1 year CA)

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Author, Year UI#	Demographics	Inclusion Criteria	Exclusion Criteria	Disease/Condition Type (N)	Study Design (Duration)
Grether 2000 20448692	Location: US Years of Birth: 1988-1994 Median GA (range), wk: Cases: : 27.1±2.4 Controls: 37.6±2.6 Mean BW (range), g: Cases: 1085±350 Controls: 1112±349 Male: Cases: 56% Controls: 47% Race: Cases: 47% White Controls: 33% White Enrolled: 170 (280 controls) Evaluated: 170 (280) Number of sites: 22	BW < 1500g or BW 1500-1999g and <33 GA	Postural cause of CP identified. Congenital infection identified	Cases: Cerebral palsy (170) Controls (288)	Retrospective case-control study (2 years)
Katz-Salamon 2000 20332284	Location: Sweden Years of Birth: 1988-1993 Median GA (range), wk: Cases: : 26.1±2.0 Controls: 26.7±1.3 Mean BW (range), g: Cases: 874±183 Controls: 940±179 Male: ND Race: ND Enrolled: 70 Evaluated: 43 (43 controls) Number of sites: 1	Cases: VLBW Survival with CLD Controls: No IVH>2 No CLD No PVL VLBW	Cases: Unable to be examined because of other medical problems, including congenital cardiac malformation, hepatitis C, immobilization of the legs, severe visual defect, and severe cerebra infarction.	Cases: VLBW infants with CLD (43) VLBW Controls (43)	Prospective cohort

Evidence Table 3. Studies Evaluating Association of LBW and Cerebral Palsy and Neurological Outcomes
Part I

Author, Year UI#	Demographics	Inclusion Criteria	Exclusion Criteria	Disease/Condition Type (N)	Study Design (Duration)
Marlow 2000 20150342	Location: UK Years of Birth: 1990-1994 Mean GA: ND (Median and Range) Sample 1: 28 (26-31) Sample 2: 28 (26-31) Mean BW: ND (Median and range) Sample 1: 960 (600-2914) Sample 2: 1026 (410-2814) Male: ND Race: ND Enrolled : 27 Evaluated: 15 Number of sites: 1	For sensorineural hearing loss (SNHL) group GA: <33 wks Family resident of Greater Bristol area Records at Hearing Assessment Center of Royal Hospital for Sick children. Born during 1990-1994 Diagnosis of SNHL of 50 dB For control group: Matched controls 2:1 to cases Admitted to the same NICUs as cases Matched for sex and GA and next and preceding matching children in the admission books of St Michael's and Sothmead hospitals	ND	Sample 1: SNHL group [15] Sample 2: Control group [30] Matched with cases for sex, GA, admission dates in NICU	Retrospective case control study with a longitudinal component (unclear if retrospective or prospective) (12 mo CA)
Palta 2000 20096107 (CNS+Eye)	Location: US Years of Birth: August 1988-June 1999 Median GA (range), wk: 28.54±1.97 Mean BW (range), g: 1003±155 Male: 43% Race: ND Enrolled: 626 Evaluated: 425 Number of sites: 6	Birth weight =1500 g Survived to 5 years of age Parental agreement to potential follow-up and provided recontact information before discharge.	Refusing participation at follow-up	VLBW infants (425)	Prospective cohort (followed to an average age of 5 years)

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Part I

Author, Year UI#	Demographics	Inclusion Criteria	Exclusion Criteria	Disease/Condition Type (N)	Study Design (Duration)
Torrioli 2000 20275419 (CNS+Eye)	Location: Italy Years of Birth: 1991-1993 Median GA (range), wk: 32 (21-34) Median BW (range), g: 1120(560-1500) Male: 42% Race: ND SES: "medium and there was the same ethnic background" Enrolled: 86 Evaluated: 36 (ND on number of controls) Number of sites: 1	BW < 1500 gm Controls: born at term and without any perinatal or neonatal complication, matched for age, gender and socioeconomic condition including occupational status of the family and parents' educational status was performed by the same observers that examined the study group	Frankly disabling conditions (CP, MR, blindness, CNS infections, genetic syndromes, etc.); abnormal head ultrasound findings Refused to participate in the study	VLBW preterm infants (36)	Prospective cohort
Valkama 2000 20233239	Location: Finland Years of Birth: 11/1/1993-10/31/1995 Median GA (range), wk: 29.3±2.2 (24.9-33.7) Median BW (range), g: 1153±289 Male: 53% Race: ND Enrolled: 62 Evaluated: 51 Number of sites: 1	VLBW<1500g and <34 weeks	Congenital anomalies Died during neonatal period Parental refusal	VLBW preterm infants (51)	Prospective cohort (18 months)

Evidence Table 3. Studies Evaluating Association of LBW and Cerebral Palsy and Neurological Outcomes
Part I

Author, Year UI#	Demographics	Inclusion Criteria	Exclusion Criteria	Disease/Condition Type (N)	Study Design (Duration)
Vohr 2000 20295211	Location: US Years of Birth: 1/93-12/94 Median GA (range), wk: Mean BW (range), g: Male: Race: Enrolled: Evaluated: Number of sites: 12	Live born BW 401-1000 g	ND	1151 extremely low birth weight survivors cared for in the 12 participating centers of the National Institute of Child Health and Human Development Neonatal Research Network	Prospective cohort (18-22 months corrected age)
Dammann 2001 21334215	Location: Germany Years of Birth: July 1983-June 1986 Median GA (range), wk: ND Mean BW (range), g: ND Male: ND Race: ND Enrolled: 591 Evaluated: 324 Number of sites: 1	BW≤1500g	ND	LBW infants (324): SGA (92) AGA (232)	Prospective cohort (6 years) 7 non-BSCP cerebral palsy (no further explanation)

Evidence Table 3. Studies Evaluating Association of LBW and Cerebral Palsy and Neurological Outcomes
Part I

Author, Year UI#	Demographics	Inclusion Criteria	Exclusion Criteria	Disease/Condition Type (N)	Study Design (Duration)
Gaillard 2001 21221175	Location: UK Years of Birth:1994-1996 Mean GA: ND (only median and range given) Sample 1: 26 (23-34) Sample 2: 26 (23-33) Mean BW: ND (only median and range given) Sample 1: 852 (520-2710) Sample 2: 745 (580-1620) Male: Sample 1: 57% Sample 2: 50% Race: ND Enrolled: 100 Evaluated: 84 Number of sites: 1	Retrospective cohort : All infants born from 1/1/1994 to 12/31/1996 Born at Liverpool Women's Hospital Ventilated beyond 27 postnatal days	If transferred from another hospital after first postnatal week (mostly surgical referrals) If ventilated after 27 postnatal days after a surgical procedure requiring anesthesia	Sample 1 : Ventilated beyond 27 (but not 50) postnatal ds (56) Sample 2: Ventilated beyond 49ds (28)	First component: Retrospective longitudinal cohort with case-control design and cases defined based on exposure (length of ventilation). Unmatched. (3 years) Second component: Retrospective longitudinal cohort study With two historical control groups (3 years)
Horwood 2001 20574647	Location: US Years of Birth: 1/93 to 12/96 Median GA (range), wk: ND Mean BW (range), g: ND Male: ND Race: ND Enrolled: 413 Evaluated: 298 Number of sites: 1	VLBW infants admitted to neonatal unit still living in New Zealand at time of assessment, 7-8 years of age	Death 17 children could not complete IQ testing because of substantial disability	VLBW infants (298)	Prospective cohort

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Part I

Author, Year UI#	Demographics	Inclusion Criteria	Exclusion Criteria	Disease/Condition Type (N)	Study Design (Duration)
Nadeau 2001 21163667	Location: Canada Years of Birth: 1987-1990 Median GA (range), wk: Cases: 27.4±1.1 Control: 39.8±1.6 Median BW (range), g: Cases: 1024.3±204.2 Control: 3453.4±497.8 Male: Cases: 51% Control: 50% Race: ND Enrolled: 129 Evaluated: 86 ? 61 (50 controls) Number of sites: 1	Cases: GA<29 weeks, BW<1500 g Controls: Normal BW children , born at the same hospital during the same time period	Cases: Lost to follow-up at 5 years 9 months: families had moved away (33), parents' refusal (10) Lost to follow-up at age 7: families had moved away (10), parents' or school's refusal (13)	Cases: EP/VLBW infants (86? 61)	Prospective cohort (at 18 months, 5 years 9 months, and age 7)
Pierrat 2001 27221167	Location: France, Netherlands Years of Birth: 1990-1998 Median GA (range), wk: 28.54±1.97 Mean BW (range), g: 1003±155 Male: 43% Race: ND Enrolled: 72 Evaluated: 60 (59 controls) Number of sites: 2	GA < 32 weeks, admitted to Lille and Utrecht Diagnosis of grade II or III PVL	ND	Preterm infants with PVL (78): Grade II (39) Grade III (39)	Prospective cohort (1 year) Cysts on the first scan and therefore were considered to be of antenatal onset (7), admitted after the first month of life with evidence of cysts on the first scan (9); no definite classification could be achieved (2)

Evidence Table 3. Studies Evaluating Association of LBW and Cerebral Palsy and Neurological Outcomes
Part II

Author, Year	Predictors	Predictor Measures	Outcomes	Outcome Measures
Leonard 1990 90204169	*CNS Predictors:* Intracranial/ Intraventricular hemorrhage *Cardiovascular or Pulmonary Predictors:* Number of days on supplemental oxygen to help $pO_2 > 50$ *Other predictors:* Parenting risk factor Low socioeconomic status	Intracranial/ Intraventricular hemorrhage - Grades 0-IV by Papille; head CT if born before 1981, head U/S is born after 1981 Parenting risk factor - defined as referral by a physician, nurse, or health professional to child protective services for neglect or mild abuse (none were for severe abuse) Low socioeconomic status - one or both parents unemployed, mother not complete high school or health insurance through public assistance	**CNS:** Neurodevelopmental: 1) Cognitive delay 2) Neurologic abnormalities	Cognitive delay: measured by McCarthy Scales of Chilren's Abilities, Wechsler Intelligence Scale for Children (Revised), Wechsler Preschool and Primary Scale of Intelligence, and Stanford-Binet "mild" - score between 1-2 SD below the mean (69-83) "moderate to severe" - score >2 SD below the mean Neurologic abnormalities: abnormalities in muscle strength, tone, reflexes or movement that cause functional impairment, i.e. hemiplegia, ataxia, quadriplegia. Clumsiness or mild tremors <u>not</u> included.
Lucas 1992 92122860	Primary predictor: General: 1) Maternal choice to breast feed Secondary predictors: Others: 1) Received mother's milk 2) Social class 3) Maternal education 4) Gender 5) Days of ventilation	Social class: 4 categories: • Social class I or II • Non manual Social class III • Manual social class III • Social class IV or V Mother's education: 5 point scale From 1: no educational qualifications To 5: degree or higher performance qualifications	IQ score in Weschler Intelligence Scale for Children-Revised-Shortened version (WISC-R)-Anglicised. 1) Verbal scale 2) Performance scale 3) Overall IQ (Assessment at 9 mo, 18 mo, 7.5-8 yrs)	Not further specified

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Part II

Author, Year	Predictors	Predictor Measures	Outcomes	Outcome Measures
Robertson 1994 94181384	Birth weight	ND	**CNS:** CP Neurodevelopmental: Motor delay Seizure disorder Multiple disabled **Ophthalmology**: Visual **Audiology**: Hearing	CP definition was that of Bax, "A disorder of movement and posture due to a defect or lesion of the immature brain", along with more recent guidelines by Levine using at least four of six clinical motor abnormalities leading to a constellation of findings of the cerebra palsy syndrome Mental retardation = scores Bayley mental scales. Initially by newborm screening; with subsequently tested repeatedly in a sound booth and/or by bristem audiological evoked response. Visual loss: acuity in the best seeing eye after correction, <20/60) including legal blindness (corrected acuity, <20/200) Hearing loss (loss of >= 30 dB binaurally)
Spinillo 1994 94257064 ***have some overlapped sample with spinillo, 1997**	Cause of antepartum bleeding CNS: Intracranial hemorrhage Periventricular leukolacia	Histological examination of deta ched placeta were used for confirmation of clinical classification Diagnosis of IVH and PVL according to US finding	**CNS:** CP Neurodevelopmental: Motor and cognitive delay Mental retardation Presence of grade 3-4 IVH or PVL	Amiel-Tison and Grenier Neonatal neurological Examination Major neonatal handicaps included definite CP such as spastic diplegia, hemiplegia or tetraplegia causing definite physical disability with moderate to severe interference with functioning, or mental retardation (Bayley Scale)

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Part II

Author, Year	Predictors	Predictor Measures	Outcomes	Outcome Measures
Chen 1995 96009403	CNS: 1) Intracranial hemorrhage 2) Periventricular leukomalacia	ND	**CNS**: Motor delay CP	Development Screening test, modified for Chinese children Diagnosed by "complete neurological exams", including transient spasticity and spastic di-/ quardriplegia
Goetz 1995 96119489	PVL	ND	**CNS:** CP Neurodevelopmental: Motor and cognitive delay Seizure disorder **Ophthalmology:** Visual impairment	ND

Evidence Table 3. Studies Evaluating Association of LBW and Cerebral Palsy and Neurological Outcomes
Part II

Author, Year	Predictors	Predictor Measures	Outcomes	Outcome Measures
Speechley 1995 96356544	General: 1) Former NICU graduate (of any BW) 2) Gender	Not further specified	Physical health outcome at 12 yrs 1) Chronic physical health (mother's report) 2) Lifetime hospitalizations (mother's report) 3) Physical impairments (mother's report) 4) Perception of child's heath (child's report) 5) Perception of child's health (mother's report) Emotional and social well being at 12 yrs: 1) Internalizing problems (child's report) 2) Externalizing problems (child's report) 3) Social competence (child's report) 4) Social support (child's report) 5) Self esteem (child's report) 6) School performance (mother's report)	Based on responses on an interviewer administered and self-report questionnaire. Physical health outcome at 12 yrs 1) Chronic physical health (mother's report): Precoded 25 chronic illnesses 2) Lifetime hospitalizations (mother's report) 3) Physical impairments (mother's report):response to a question asking whether their child had any physical impairments 4) Perception of child's heath (child's report): 4-item scale 5) Perception of child's health (mother's report): 4-item scale Emotional and social well being at 12 yrs: 1) Internalizing problems (child's report) 3-item scale 2) Externalizing problems (child's report) 3-item scale 3) Social competence (child's report) 36-item scale 4) Social support (child's report) 24-item scale 5) Self esteem (child's report) 10-item scale 6) School performance (mother's report) 5-item scale

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Part II

Author, Year	Predictors	Predictor Measures	Outcomes	Outcome Measures
Wildin 1995 95385294	CNS: 1) Neurological exam- 6 months - 12 months 2) Quantitative neurologic score	Based on Amiel-Tison examination done at 6 months corrected age	**CNS:** Neurodevelopmental: Motor delay Cognitive delay Rate of development	Stanford-Binet developmental test McCarthy Gross Motor subtests Bayley scale
Wildin 1997 97422739	Other: 1) Socioeconomic status 2) Medical risk category: High Risk (HR); Low Risk (LR)	High medical risk = severe medical complications of prematurity		
***Data from same longitudinal study as Anderson, 1996 96314587 & Smith, 1996 97081985; overlapped sample**				

Evidence Table 3. Studies Evaluating Association of LBW and Cerebral Palsy and Neurological Outcomes
Part II

Author, Year	Predictors	Predictor Measures	Outcomes	Outcome Measures
Anderson 1996 96314587 Smith 1996 97081985 (CNS+All) ***Data from same longitudinal study (U. of Texas Health Sciences Center in Houston and the U. of Texas Medical Branch in Galveston) as Wildin, 1995 & 1997; overlapped sample**	Other Predictors: Illness Acuity – grouped into low-risk and high-risk. Maternal Behaviors: 1) warm sensitivity 2) Maintaining of infant interests and directiveness.	Based on the severity of neonatoal complications grouping into High- and Low- risk groups: High risk: =1 severe neonatoal complications, including chronic lung disease (bronchopulmonary dysplasia), grade III or IV intraventricular hemorrhage, and periventicular leukomalacia Low risk: : =1 less severe neonatal complications, including transient respiratory distress, respiratory distress syndrome, and grade I or II intraventricular hemorrhage, and periventicular leukomalacia Maternal Behaviors - home observation with use of a rating scale.	**CNS:** Neurodevelopmental: Cognitive delay **Audiology**: Language **Other**: Living skills	Baley Mental and Psychomotor development indices (MDI, PDI) Neurologic scores based on scales developed by Amiel-Tison, Baird and Gordon, and Swaiman Sequenced mixture of communication development Daily living skills subscale from Adaptive Behavior Scale
Kato 1996 97182916	VLBW GA Sex Perinatal factors (mat age, parity, preeclampsia, previa, PROM, fetal presentation,	VLBW= ND Small for Dates = ND PROM = ND	**CNS** *CP:* Neurodevelopmental: Mental retardation Seizure disorder Blindness Lump all together as major handicap	ND

Evidence Table 3. Studies Evaluating Association of LBW and Cerebral Palsy and Neurological Outcomes
Part II

Author, Year	Predictors	Predictor Measures	Outcomes	Outcome Measures
Katz 1996 97145056	General: GA CNS: 1) Intracranial/ Intraventicular hemorrhage 2) Periventricular leukomalcia (cystic PVD) 3) PVD (if unilateral or bilateral periventicular echogenic lesions present on at least 3 scans)	IA IVH: no lesion= consistently NC scans. Mild lesion = germinal hem or small IVH or PVD or mild vent dilation without hem. Severe lesion: blood distends the vents or in parenchyma, or multicystic PVC.	**CNS:** Neurodevelopmental: Attention IQ	 Measured by CPT test (continuous Performance Test) measuring errors of omission or commission. Is also measured by CBCC (Child Behavior Check List): parents check off behavior related to n attention and hyperactivity. Measured by British Abilities Scale
Korkman 1996 96374730 Psy1996	Main predictors: General: 1) VLBW and AGA (surrogate for perinatal asphyxia in preterm) 2) VLBW and SGA (surrogate for ante-natal asphyxia in preterm) Secondary predictors General: 1) Apgar scores 2) Arterial PH at 2 hrs of life 3) Intrauterine growth retardation 4) BW Pulmonary: 1) RDS 2) Duration of ventilatory tx CNS: 1) IVH	1) 2) VLBW: less than 1500 g 3) SGA: 2 SD below normal for GA 4) Birth asphyxia: Umbilical arterial ph<7.05 5) Or Apgar scores at 5 min less than 6	1) 2) Psychometric Intelligence score. 3) Detailed Neuropsychological assessment score. 4) Neurological Disability status examination (Assessment between 5-9 yrs)	Psychometric Intelligence score: by Finnish standardized Revised version of the Wechsler Intelligence Scale for Children (WISC-R 1984) 1) FSIQ: Full Scale IQ 2) VIQ: Verbal IQ 3) PIQ: performance IQ Detailed Neuropsychological assessment score: 1) NEPSY test (a new test consisting of testing of attention, language, motor, sensory, visuospatial and memory subsets) 2) The Token te st shortened version 3) The VMI test Established Finnish norms. Scores reported as SD scores (z scores) Sum scores in all 3 tests also calculated Neurological Disability status assessment: not specified

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Part II

Author, Year	Predictors	Predictor Measures	Outcomes	Outcome Measures
Lucas 1996 96302121	General: 1) Full fortification for breast milk	Full breast milk Fortification vs Minim supplementation with minerals only, both groups received vitamins	**CNS:** 1) Neurodevelopmental: 2) Motor delay 3) Mental retardation **Audiology:** 1) Language **Other:** 2) Social development	At 9 month: Knobloch Developmental Inventory At 18 month: Knobloch; Bayley scales; Vineland test of social maturity

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Part II

Author, Year	Predictors	Predictor Measures	Outcomes	Outcome Measures
Rieck 1996 Psy 1996 06905005	In prospective longitudinal component: General: 1) Perinatal factors: 2) BW 3) GA 4) SGA 5) Neurological complications in NICU 6) Sex Growth: 1) HC percentile CNS: 1) Developmental scores at 1-2 yrs of age Others: 1) Age at assessment 2) Parental (mother's and father's) age 3) Parental education 4) Country of origin Prospective comparative component. • VLBW vs Middle class term child And vs Low class term child	Neurologic complications in NICU: 1) Severe asphyxia 2) Loss of consciousness 3) Convulsions 4) IVH grade 3-4 5) CNS infections HC percentile: 1) > 20% 2) 3-20% 3) < 3% Country of origin: Israel Euro-American Asian-African	**CNS:** Neurodevelopmental outcome: 1) Scores in McCarthy 's 5 Scales of Children's Abilities test (MSCA) 2) General Cognitive Index (GCI) score (Assessment between 3-7 yrs of age)	MSCA: Translated in Hebrew Adapted to Israeli children 5 scales: 1) Verbal 2) Perceptual-Performance 3) Quantitative 4) Memory 5) Motor (GCI) scores: From subtests of the : 1) Verbal 2) Perceptual-performance and 3) Quantitative scales

Evidence Table 3. Studies Evaluating Association of LBW and Cerebral Palsy and Neurological Outcomes
Part II

Author, Year	Predictors	Predictor Measures	Outcomes	Outcome Measures
Whitaker 1996 97040639	General predictors: BW,GA, SGA/IUGR Chronic illness, Apgar score Sex CNS Predictor: IVH PL/VE Bronchopulmonary dysplasia Maternal-social disadvantage	Mat-Social Disadvantage: not high school gradated; nonwhite race; income from public assist; <19 yrs; not married. According to US findings	**CNS**: Neurodevelopmental: Cognitive delay Mental retardation Memory **Ophthalmology** : Visual perceptual **Audiology:** Language	Test of language Development Stanford-Binet Intelligence Scale
Blitz 1997 97154301	Neonatal complications of ELBW infants, including meningitis, PVL, hydrocephalus, seizures, IVH, BPD, ROP, and whether the infant was discharged on oxygen	Diagnosis based on hospital course. IVH = grade III	**CNS:** CP Neurodevelopmental Development outcome Neurologic Outcome **Ophthalmology:** Visual problems **Audiology:** Hearing loss Hearing loss Visual problem	BSID (Bayley Scale of Infant Development), MDI (Mental Developmental Index), PDI (Psychomotor developmental Index), CLAM (Clinical Linguisitc and Auditory Milestone Scale): Total (CLAM-T), Expressive (CLAM-E), and Receptive (CLAM-R) scores Neurodevelopmental examination, modified after Amiel –Tison and the Primitive Reflex Profile ND Strabismus, hyperopia, myopia, or retinal detachment
Cheung 1997 97310950	IVH grade III or IV	Diagnosed by US finding	**CNS:** Cognitive delay	Cognitive delay - Belay Mental and Psychomotor development indices (MDI, PDI) Normal neurodeveloplement: free of neurodevelopmental disability, with Bayley scores higher than 2 SD below the mean Neurodevelopmental disability: cerebral palsy or blindness or hearing loss

Evidence Table 3. Studies Evaluating Association of LBW and Cerebral Palsy and Neurological Outcomes
Part II

Author, Year	Predictors	Predictor Measures	Outcomes	Outcome Measures
Ekert 1997 97251211	General: 1) Birth weight 2) GA 3) Apgar score CNS: 1) Intracranial / Intraventricular hemorrhage 2) Periventricular leuko-malacia Cardiovascular/pulmonary: 1) Bronchopulmonary dysplasia other: a) ventilator days, b) 02 days Other: Hospital/health care resource (admission days) utilization.	Diagnosis of IVE or PVE according to US findings	**CNS:** Motor delay Cerebral palsy Cognitive delay	Motor and cognitive delays: Bayley score of < 84 (i.e., =1 SD below mean) or developmental quotient (developmental age divides by corrected age) of < 0.75 Evidence of hypertonicity and hyperreflexive in association with at least gross motor developmental delay

Evidence Table 3. Studies Evaluating Association of LBW and Cerebral Palsy and Neurological Outcomes
Part II

Author, Year	Predictors	Predictor Measures	Outcomes	Outcome Measures
Gerner 1997 97329414	General: 1) Prematurity (per se) 2) General maternal, obstetric, and perinatal predictors: ➢ Maternal education ➢ Maternal age ➢ Parity ➢ Maternal toxemia ➢ Maternal septicemia ➢ Placental bleeding ➢ Sex, Gestational age, Birth weight, Intrauterine growth, Cardiotocography, Apgar score at 5 min 3) CNS: (Ultrasound findings) ➢ Subependimal bleeding ➢ Intraparenchymal lesions 4) Cardiovascular or Pulmonary: ➢ PDA, RDS, Surfactant therapy, Days of Ventilatory tx, Chronic Lung Disease (CLD), Pneumothorax, 5) Other : ➢ Age at time of test, Infantile septicemia.	Maternal education:3 levels Parity: 0 or more Maternal toxemia, Maternal septicemia, Placental bleeding: presence or absence Intrauterine growth: SGA or AGA Cardiotocography: normal or abnormal All cranial U/S findings classified according to the most advanced stage observed Subependymal bleeding: 3 grades: B1: isolated germinal matrix/ subependymal haemorrhage B2:IVH without ventricular dilatation B3:IVH with ventricular dilatation Intraparenchymal lesions: 4 grades: W1:Subtle or diffuse echodensity W2: Definite, distinct echodensity W3: perventricular cystic formation (PVL) Intraparenchymal W4: echodensity of haemorrhagic type or other gross pathology W1 – W2: correspond to non-cystic PVL B1-3 plus W1-4 PDA: none, spontaneous/ pharmacologic closure, Surgical ligation RDS: presence or absence CLD: according to Bacalari criteria Infantile septicemia: verified by blood culture: staph epi, candida, naerobic bacteria, other. (The other predictors were not specifically defined)	1) Griffith's Developmental Scale for Psychomotor development 2) Total Score (sum of subclasses scores) 3) Individual subclasses Scores (Assessment at 10 months of age)	Griffith's developmental scale, standardized for Swedish infants: 5 subclasses Scale A: locomotor function, Scale B: Personal-social competence, Scale C: hearing and speech Scale D: Hand and eye coordination: fine motor grasping Scale E: Performance: Perception and intelligence scale Scale Specificity of subclasses: limited when infants tested are immature/ Specificity increases with age.

Evidence Table 3. Studies Evaluating Association of LBW and Cerebral Palsy and Neurological Outcomes
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Author, Year	Predictors	Predictor Measures	Outcomes	Outcome Measures
Koller 1997 97193708	General: 1) Birth weight 2) GA 3) Illness severity -neonatal health index 4) maternal education CNS: Neurological status at 1 year	Neurological status at 1 year corrected age: (1) abnormal, a severe abnormality, such as CP, global hypotonicity, chronic seizure, hydrocephaly, blindness, or severe sensorineural hearing loss, for which a diagnosis could be established (2) suspicious, some atypical or questionable signs in tone, reflexes, gait, or movement, but for which there is no definitive diagnosis or syndrome (3) Normal, based on a completely normal neurologic examination	**CNS:** Neurodevelopmental: Cognitive delay	Bayley MDI, Stanford-Binet IQ, Wechsler scale
Murphy 1997 97192793	General: GA, Apgar score CNS: Intracranial/Intraventricular hemorrhage White Matter Disorder Periventricular leukomalacia Ventriculomegaly/Ventricular diration. Seizures Cardiovascular: Bronchopulmonary dysplasia Preurmothora GI: Total Patenteral Nutrition Other: Infectious disease, Transfusion PDA, Prolonged ventilation.	Definitions not given for most predictors.	**CNS:** Cerebral palsy	Obtained diagnosis from regional registry of childhood impairments.

Evidence Table 3. Studies Evaluating Association of LBW and Cerebral Palsy and Neurological Outcomes
Part II

Author, Year	Predictors	Predictor Measures	Outcomes	Outcome Measures
Schendel 1997 98033417	*General Predictors* 1) Birth Weight- 3 groups VLBM (very low birth wt) MLBW (moderately low birth wt.) NBW (normal birth wt) *Other Predictors* *1)* Other: married at birth *2)* Other: Medicaid recipient	ND	**CNS:** Other: Developmental Delay **Pulmonary Outcomes** Birth weight	Developmental delay measured by Denver Developmental Screening Test II. "DELAY" defined by 9 measures of performance on Denver Developmental Screening Test II at age 15 months corrected.
Thompson 1997 97268338	Other predictors: 1) Neurobiological Risk Score (NBRS) 2) Hasseles Scale Score (HSS) → divided mothers into high and low risk; a "stress" score 3) Maternal variables	NBRS→weighted scored of medical events: ventilation, acidosis, seizures, IVH, PVL, sepsis and hypoglycemia	**CNS**: Neurodevelopmental: Cognitive delay	McCarthy scales at age 4 years Definition: not clear on how well validated either of the predictors are. Definitions of NBRS and Hasseles scores are probably OK, but I am not familiar with these.
Victorian Infant Collaborative study Group 1997 98026322 ***There are a series of Victorian articles in LBW-ALL.** ***This study will be combined in LBW-ALL table**	General: BW Other: period of time when born	Each sample were subdivided into BW=500-749 g and BW=750-999 g 1985-1987 vs. 1991-1992	**CNS**: Cerebral palsy Neurodevelopmental: Cognitive and motor delay Disability **Ophthalmology**: Blindness **Audiology:** Deafness or hearing aid	CP was not defined Bayley Scales of Infant Development DQ, using the published mean and SD Disability: "Sever" – bilateral blindness, cerebral palsy with the child unlikely ever to walk, or a DQ score <-3SD; "Moderate" – bilateral sensorineural deafness requiring hearing aids, cerebral palsy in children not walking at 2 but expected to walk, or a DQ score from –3SD to <-2 SD; "Mild" – cerebral palsy but walking at 2 , or a DQ score form –2 SD to <-1 SD.

Evidence Table 3. Studies Evaluating Association of LBW and Cerebral Palsy and Neurological Outcomes
Part II

Author, Year	Predictors	Predictor Measures	Outcomes	Outcome Measures
Battin 1998 99002694	General: 1) GA (23-25 wks) In comparative component with Historical control group General: 1) Birth during a period with routine use of: antenatal steroids, surfactant and dexamethasone for BPD (vs birth in presurfactant, presteroid period)	ND	**CNS:** 1) Neurodevelopmental outcome 2) CP 3) Low MDI (below 2 SDs) **Ophthalmology- Audiology:** 1) Blind, Deaf	Neurologic exam Bayley scale: MDI, PDI Formal hearing test Ophthalmologic examination
Bos 1998 98218970	General predictors Quality of general movements CNS Head ultrasound finding of transient periventricular Echodensities	Diagnosed by US examination. The duration was determined for the frontal and the parieto-occipital region separately and classified according to four categories: (1) no echodensities, (2) echodensities between 1 and 6 d, (3) echodensities between 7 and 13 d, and (4) echodensities persisting for more than 14 d.	**CNS:** Neurodevelopmental CP Cognitive delay	Developmental trajectory of general movement quality, analyzed according to Prechtl's method. Movements were judged globally based on visual Gestalt perception. Normal general movements are characterized by complexity, variability, and fluency.
Cherkes-Julkowski 1998 98262696	General: GA Other: Mother perception of child competence	ND	**CNS:** Cognitive delay Neurodevelopmental School problem Neurological Impairment (NI) Attention Deficit Disorder (ADD) **Audiology:** Language	Cognitive delay, measured by Stanford-Binet School programs (school concerns = SC) Learning disabilities (LD) Neurological Impairment (NI) Attention deficit Disorder (ADD) Language impairment = LI – dx made by speech and language clinician

Evidence Table 3. Studies Evaluating Association of LBW and Cerebral Palsy and Neurological Outcomes
Part II

Author, Year	Predictors	Predictor Measures	Outcomes	Outcome Measures
Emsley 1998 98238139 (CNS+ All)	*General* 1) Birth weight 2) GA *CNS* 1) Other: significant cranial U/S findings (see page 1 for definition) *Other:* 1) Illness acuity – CRIB score 2) Other: male sex	 CRIB score is determined by BW, GA< congenital malformations, max base excess in first 12 hours, minimum FIO_2 in first 12 hours and max FIO_2 in first 12 hours	**CNS :** CP Neurodevelopmental Disability : normal, mild, moderate severe Behavioral disorders Learning disabilities Seizure disorder Developmental Delay **Ophthalmology :** Blindness Other Squint **Audiology:** Deafness Speech delay	ND "Normal"- No clinically apparent developmental abnormality causing functional disability "Mild Disability" - myopia, language delay, mild hearing loss, hyperactivity or clumsiness. "Moderate Disability" – Spastic diplegia, hemiplegia, moderate learning disability (DQ 50-69) "Severe Disability" – spastic quadriplegia, blindness, deafness (> 70 dB), uncontrolled epilepsy or severe learning disability (DQ < 50) and multiple disabilities. Not defined or how it is measured ND DQ < 70 > 70 dB, dot defined or how it is measured ND
Pasman 1998 98196839	*CNS* 1) Other: Neurobiologic risk score (NBRS) 2) Neonatal Neurologic Inventory (NNI) table 1	 13 items of NBRS 4 items of NNI	**CNS** Neurodevelopmental: Cognitive delay Mental retardation	Standardized testing: VMI Leiden diagnostic test WISC-R BWVR ADIT
Rogers 1998 98438124	Birth weight GA Periventricular Bronchopulmonary dysplasia Hospital/Health care resource utilization-length of stay	IVH according to discharge clinical record diagnosis	**CNS:** CP **Neurodevelopmental:** Growth failure	According to discharge clinical record diagnosis (quadriplegia, diplegia, or hemiplegia) Weight-for-age z score was more than 2 SD below the mean and subsequently fell below –2 SDS

Evidence Table 3. Studies Evaluating Association of LBW and Cerebral Palsy and Neurological Outcomes
Part II

Author, Year	Predictors	Predictor Measures	Outcomes	Outcome Measures
Spinillo 1998 98237382 Spinillo, 1997 98021316 & 97277958 ***have some overlapped sample with spinillo, 1994**	General predictors: 1) Birth weight' 2) GA 3) SGA/IUGR 4) Maternal disease (diabetes, respiratory, cardiovascular, renal etc) 5) Antenatal steroids Other predictors: 1) Infectious disease 2) Dexamethasone 3) Perinatal factors (Socioeconomic factors, pregnancy variables, Delivery variables) 4) Meconum-stained amniotic fluid	Preeclampsia defined as: 1) Diastolic BP> 90 2) Systolic BP> 140 3) Proteinurea> 0.3 g Severe preeclampsia defined as: 1) Diastolic BP> 110 2) Systolic BP> 160 3) Proteinurea> 3 g Intrapartum Fetal HR abnormalities: • Late decelerations 1) Variable decelerations 2) Bradycardia Tachycardia	**CNS** CP Neurodevelopmental: Mental retardation	CP: Spastic diplegia, hemiplegia, tetraplegia , With moderate to severe interference with function, With or without mental retardation (MDI< 71) Bayley scales
Tin 1998 99046171	General: GA (23-31 wks)	ND	**CNS:** Neurodevelopmental: 1) Mental retardation (IQ < 75) 2) Other; disability (severe, severe sensorimotor) 3) Other: development - assessed by Griffith's mental and developmental scales	Definition of "severe disability" and "severe sensorimotor disability" were not given in this article . They referred to the wrong reference for these definitions, therefore, I am unable to find the definitions. Reference population for Griffith's scales were "preterm babies in the study S serious sensorimotor disability"

Evidence Table 3. Studies Evaluating Association of LBW and Cerebral Palsy and Neurological Outcomes
Part II

Author, Year	Predictors	Predictor Measures	Outcomes	Outcome Measures
Burguet 1999 99126269	General Predictor: 1) Male gender Cardiovascular 1) Bronchopulmonary dysplasia Other predictor: 1) Infectious disease neonatal sepsis 2) Maternal hypertension 3) RDS 4) Outborn birth 5) Race 6) Urban residence 7) Family precariousness = father absent or both parents unemployed 8) PROM > 48 hours (preterm) 9) Monochorionic placentation 10) Singleton placentation 11) Dichorionic placentation	RDS diagnosed by chest radiography examination PROM = premature rupture of membrane	**CNS:** CP PVL	One or more of the following signs was observed – hemiplegia, diplegia, tetraplegia, dystonia, athetosis, blindness, or neurosensory deafness
Cooke 1999 99257637	General predictors: Antenatal steroids Period of birth CNS: IVH Periventricular leukomalacia Other: Surfactant use	ND	**CNS:** CP	Data from Regional Cerebral Palsy Register

Evidence Table 3. Studies Evaluating Association of LBW and Cerebral Palsy and Neurological Outcomes
Part II

Author, Year	Predictors	Predictor Measures	Outcomes	Outcome Measures
Cooke 1999 99380719	Birth weight CNS: white matter disorder, periventricular leukomalacia, ventriculomegaly, MRI abnormality, thinning of corpus callosum, povencephaly, Brain measurements (multiple)	ND	**CNS:** Motor delay Cerebral palsy Cognitive delay Mental retardation Behavioral disorders School problems Learning disabilities	IQ: WISC III Motor delay (motor disability): Movement of ABC scores Mental retardation Behavioral disorders School problems Learning disability: Suffolk Reading Scale. Basic Math and Spelling Test

Evidence Table 3. Studies Evaluating Association of LBW and Cerebral Palsy and Neurological Outcomes
Part II

Author, Year	Predictors	Predictor Measures	Outcomes	Outcome Measures
Finer 1999 99436635	*CNS Predictors:* Delivery room resuscitation (DR-CPR)	Defined as chest compressions and/or epinephrine used.	**CNS:** *Neurodevelopmental* 1) Motor delay 2) Post hemorrhagic hydrocephalus (PHH) 3) Apgar scores 4) IVH/echolucenies 5) Developmental 6) White matter injury	In the first year, neurodevelopmental assessment by Amiel-Tison Neurologic Screen. Thereafter, used Knoblick-Gesell Developmental Inventory. "Neuromotor Outcome - questionable": hypotonia, hypertonia, asymmetry "Neuromotor Outcome - abnormal": cerebral palsy "Developmental Outcome - normal": both mental and motor composite scores ?86 "Developmental Outcome - questionable": either score 76-85 "Developmental Outcome - abnormal": either score <75 "Neurodevelopmental Outcome - normal" if both neuromotor and developmental evaluations are normal. "Neurodevelopmental Outcome - questionable" if either neuromotor or developmental evaluations are questionable. "Neurodevelopmental Outcome - abnormal" if either neuromotor or developmental evaluations are abnormal. "White matter injury": presence of grade 4 hemorrhage, echolucencies, or ventricular dilation unrelated to hemorrhage.

Evidence Table 3. Studies Evaluating Association of LBW and Cerebral Palsy and Neurological Outcomes
Part II

Author, Year	Predictors	Predictor Measures	Outcomes	Outcome Measures
Futagi 1999 99450356	General: 1) Birth in surfactant era 1989-1993 vs Birth in pre-surfactant era 1981-1986	Not specified further	1) Normal neurodevelopmental outcome 2) Cerebral palsy 3) Mental retardation 4) Borderline intelligence (Assessment between 3-8 yrs, mean age of assessment was 6 yrs)	*1)* Normal neurodevelopmental outcome: Absence of motor disturbances and developmental quotient and/or intelligence quotient more than 84. 2) Cerebral palsy: diagnosis based on Bax criteria (Outcome data also given for one child with spinal palsy: no definition given) 3) Mental retardation: DQ or IQ scores less than70 4) Borderline intelligence: DQ or IQ scores between 70-84, DQ and /or IQ scores: (of latest exam)according to Kyoto child guidance clinic development scale for children for subjects up to 7 yrs of age, Or according to the revised Wechsler Intelligence scale adapted for Japanese children for cases more than 7 yrs of age. (the results of gross motor skills in the former test were excluded for cerebral palsy children when computing DQs)
Kim 1999 99416608	Other Predictor- Perinatal factors	ND	**CNS:** CP **Neurodevelopmental:** Development delay	Non-progressive, often changing motor impairment syndromes secondary to lesions or anomalies of the brain arising in the early stages of development Delay in parameters for motor development of more than two months according to the stages of motor development by Vojta

Evidence Table 3. Studies Evaluating Association of LBW and Cerebral Palsy and Neurological Outcomes
Part II

Author, Year	Predictors	Predictor Measures	Outcomes	Outcome Measures
Krageloh-Mann 1999 99431017	CNS: 1) Intracranial/ Intraventricular hemorrhage 2) PVL 3) Cerebral blood flow 4) Cerebral oxygen delivery	CBF measured with ^{133}Xe clearance at 12.9 hours of life (range 1-48hr) Cerebral oxygen flow calculated as CBF x ART 02 content	**CNS:** Spastic CP **Neurodevelopmental**: Motor delay Mental retardation Anatomical abnormalities on MRI **Ophthalmology:** Visual blindness	Stott-Moyes-Henderson test - Spasticity of extremities with flexor hypertonicity, increased tendon reflexes and characteristic posturing Motor disability was graded as severe if the child could not walk unaided at the age of 5 y, otherwise as mild WISC
Salokorpi 1999 99353226	General: BW, GA, SGA/IUGR, Maternal disease CNS: IVH grade III or IV PVL Other: duration of ventilation, hypotension, hypocarbia, infectious disease	ND	**CNS:** CP Mortality by 2 years	A diagnosis of CP was confirmed when abnormal muscular tone, persistent or exaggerated primitive reflexes and major delay in motor development were found. The classification of CP syndromes was based on the definition by Hagberg et al.
Shepherd 1999 99165413	Ophthalmology : VEP (visual evoked potential)	One flash per second 20 cm from eyes. Each trial included 30 responses. 2 trials averaged. In preterms, VEP measured at 3 day of life in groups < 34 weeks, 34-36 weeks and 40 weeks, when 3,6-12 months.	**CNS:** Cerebral palsy	No definition of CP given
Stathis 1999 99325758	CNS Predictors 1) Other: head circumference category 2) Head growth velocity	Self-explanatory	**CNS:** Neurodevelopmental: Cognitive delay Behavioral disorders-ADHD School problems Learning disabilities	Academic problems--Answer questionnaires given to teacher ADHD--Dr. Paul rating scale McCarthy's scales

Evidence Table 3. Studies Evaluating Association of LBW and Cerebral Palsy and Neurological Outcomes
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Author, Year	Predictors	Predictor Measures	Outcomes	Outcome Measures
Vohr 1999 99332101	Intracranial/Intraventricular hemorrhage	Cranial ultrasound finding	**CNS**: CP Neurodevelopmental: Cognitive and Motor delay	CP diagnosed by routine neurological exam. CP was based on the presence of hypertonicity, hyperreflexia, and dystonic or spastic movement quality in the affected limbs. Stanford-Binet Intelligence Scale PPVT-R
Agustines 2000 20279724	General predictors: 1) BW (500-750) 2) GA	ND	**Neurodevelopmental outcome:** Bayley scale 1) MDI 2) PDI 3) Overall neurodevelopmental outcome 4) Neurodevelopmental outcome stratified by GA (assessment at 30 months corrected age)	1) Normal development: Performance within 1 SD 2) Mild delay: Performance below 1 SD 3) Severe delay: Performance below 2 SD

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Author, Year	Predictors	Predictor Measures	Outcomes	Outcome Measures
Breslau 2000 20298367	General: 1) LBW (vs Normal BW= NBW) 2) Urban (vs suburban setting) 3) Maternal smoking during pregnancy	ND	**CNS/Behavior** 1) Behavioral problems in 3 domains: Attention , Externalization Internalization 2) Severe attention problems (above a cutoff point of 67) Assessment at 11 yrs of age (assessment at 6 yrs: reported in another publication)	Mother's rating was done with: Child Behavior Checklist (CBCL) Teacher's rating was done with Teacher Report Form (TRF) (teachers were blind to the BW information of the child) Assessments at 11 yrs were conducted blindly to the results of assessments at 6 yrs (reported in another publication) Attention problem subscale; 20 items Externalization problem subscale: 2 subclasses Internalization problem subscale: 3 subclasses
Buhrer 2000 20280896	CRIB score	Routinely measure on the first day of a baby's life. CRIB score determined from: BW, GA, congenital life-threatening malformations, worse base excess, min+max FIO2 in first 12 hrs of life	**CNS:** Neurodevelopmental	Griffith's test
Grether 2000 20448692	Received Magnesium sulfate	Chart review	**CNS:** CP	Mild, moderate, or severe CP assessed from record of 2 state agencies.
Katz-Salamon 2000 20332284	Cardiovascular or pulmonary predictors: chronic lung disease	1st week ? acute lung injury; clinical signs; supplemental O_2 at 28 days; typical CXR	**CNS:** Neurodevelopmental: Cognitive delay CP	Griffith's development scale Movement assessment index (MAI): the original number of items was reduced to include only those reported to be the most valid as predictors of CP

Evidence Table 3. Studies Evaluating Association of LBW and Cerebral Palsy and Neurological Outcomes
Part II

Author, Year	Predictors	Predictor Measures	Outcomes	Outcome Measures
Marlow 2000 20150342	**General:** 1) Birth weight 2) Apgar score 3) Illness severity (CRIB) scores **CNS:** 1) Maximum bilirubin level 2) Abnormal cerebral US scan **Audiology:** 1) Sensorineural hearing loss **Cardiovascular/Pulomonary:** 1) Duration of intubation, respiratory support, oxygen, pH<7.2, base excess 2) Dopamine 3) Furosemide 4) Indomethacin use **Other:** 5) Netilmicin 6) Vancomycin 7) Positive blood cultures 8) Bilirubin >200 ?mol/l 9) Bilirubin>GA x 10 10) Creatinine >60 mmol/l 11) Netilmicin 12) Vancomycin :ombination of the above: 1) Bili.200 + acidosis 2) Bili> 200 + sepsis 3) Bili >200+ netilmicin 4) Bili> 200+ vancomycin 5) Bili>200+ furosemide 6) Peak bil+ acidosis 7) Peak bili+ sepsis 8) Peak bili+ netilmicin 9) Peak bili+ furosemide 10) Creatinine>60+ netilmicin or vancomycin or furosemide 11) Netilmicin+furosemide • Vancomycin+ furosemide	Not further specified	In case control component: **Audiology:** Sensorineural hearing loss (SNHL) of 50 dB within 9 months from birth In Longitudinal component: **CNS:** Cerebral palsy at 12 months of age in the 2 groups (SNHL and control group)	Cases of SNHL were identified if the hearing loss had been identified within 3 months of discharge home, (within 9 mo from birth); after excluding cases with conductive hearing loss, possible congenital cause, or had neonatal bacterial meningitis

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Part II

Author, Year	Predictors	Predictor Measures	Outcomes	Outcome Measures
Palta 2000 20096107 (CNS+Eye)	General: 1) Birth weight 2)Antenatal steroids 3)Multiple birth CNS: Intracranial/ Intraventricular hemorrhage Ophthalmology: Retinopathy of Prematurity (ROP) Cardiovascular/ Pulmonary: 1)Surfactant administration 2)Respiratory score Other: 1)Multiple birth 2)Socioeconomics 3) Number days in NICU	BW ≤1500 gms VLBW -Baseline respiratory scores = disease 1st 3 days of life 0-100 based on increasing severity BPD: O2 use at 36 wks post conceptional age postnatal used corticosteroid use mechanical ventilation or both = severe BPD at 30 days	**CNS:** CP Neurodevelopmental: Functional assessments **Ophthalmology:** Visual impairment Blindness Standardized scores for **self care, mobility and social function**	CP: physician dx at parent interview and confirmed by clinic record abstraction as well as blindness and use of corrective lenses. Pediatric Evaluation of Disability Index (PEDI): standardized scores for self care, mobility and social function
Torrioli 2000 20275419 (CNS+Eye)	General: 1) Birth weight 2) GA 3) SGA/IUGR	ND	**CNS:** Neurodevelopmental: Motor delay Cognitive delay Behavioral disorder **Ophthalmology:** Visual impairment	For VMI &WISC measures, "abnormal" was defined as under the 5th%tile; "normal" was defined as over 15th %tile of a control group VMI Movement WISC Conner's relent symptom questionnaire
Valkama 2000 20233239	**General predictors:** Birth weight GA SGA/IUGR **CNS predictors:** IVH White matter disorder Periventricular leukomalacia MRI findings	IVH grading according to Papile PVL grading according to DeVries	**CNS:** Cerebral palsy	Infants whose motor development was delayed and who had abnormal muscle tone and motor function as an impairment or disability at a corrected age of 18 mo were defined as having CP in the sense of Hasberg et al.

Evidence Table 3. Studies Evaluating Association of LBW and Cerebral Palsy and Neurological Outcomes
Part II

Author, Year	Predictors	Predictor Measures	Outcomes	Outcome Measures
Vohr 2000 20295211	*General:* 1) Birth weight 2) Maternal disease (HTN) 3) Antenatal steroids *CNS:* 1) Intracranial/Intraventricular hemorrhage (GR 3 to $ IVH/PVL) *Cardiovascular or Pulmonary:* 1) Chronic lung disease (oxygen requirement at 36 weeks) 2) Other: postnatal steroids 3) Other: Surfactant *Gastrointestinal:* 1) Necrotizing "enterocolitis" *Other:* 1) Other: male sex 2) Other: Race (white) 3) Other: sepsis (early and late onset) 4) Other: maternal education	GR 3 to 4 IVH. PVL undefined sepsis undefined	**CNS :** Cerebral palsy Neurodevelopmental: 1) Motor delay (sitting, walking, pincer grasp, feeding) 2) Seizure disorder 3) Post hemorrhagic Hydrocephalus (PHH) and shunt 4) Other: Neurologic exam (normal; abnormal) 5) Development (MDI and PDI by Bayley II Scale) **Ophthalmology :** 1) Visual impairment (any) 2) Blindness (unilateral, bilateral) **Audiology:** 1) Hearing disorders	"normal Neurologic exam": no abnormalities on neurologic exams
Dammann 2001 21334215	*General Predictors:* 1) Birth weight 2) SGA/IUGR *CNS Predictors:* 1) Intracranial/ Intraventricular hemorrhage *Other predictors:* 1) Infectious disease 2) Perinatal factors - PTL, PROM, C-section	ND	**CNS:** CP	ND

Evidence Table 3. Studies Evaluating Association of LBW and Cerebral Palsy and Neurological Outcomes
Part II

Author, Year	Predictors	Predictor Measures	Outcomes	Outcome Measures
Gaillard 2001 21221175	In retrospective case-control component: **General:** 1) shorter length of ventilation beyond 27 (but not 50) postnatal ds vs more prolonged ventilation beyond 49 ds 2) Number of days "off"" ventilator in the groups of 27-49 postnatal ds ventilation and the group of >49ds ventilation In retrospective cohort with historical control group component: **General:** 1) Birth in a period where Antenatal steroids and Surfactant were more routinely used vs birth in pre-surfactant pre-antenatal steroid period	Not further specified	**CNS:** Neurodevelopmental outcome: 1) Normal 2) Mild disability 3) Moderate disability 4) Severe disability	Normal neurodevelopmentally: no clinically apparent neurodevelopmental abnormality causing functional disability Mild disability: e.g. myopia, language delay, mild hearing loss, hyperactivity or motor clumsiness. Moderate disability: for example: spastic diplegia, hemiplegia or moderate learning disability (Developmental Quotient: 50-69) Severe disability: e.g. spastic quadriplegia, blindness, deafness (loss of 70 decibel or more), uncontrolled epilepsy, or severe learning disability (developmental quotient <50). Infants with multiple disabilities. (3 yrs CA)
Horwood 2001 20574647	Other: Breastfeeding duration	Retrospective questioning	**CNS:** Neurodevelopmental: Cognitive delay Mental retardation	WISC-R verbal and performance IQ scores at age seven years.

Evidence Table 3. Studies Evaluating Association of LBW and Cerebral Palsy and Neurological Outcomes
Part II

Author, Year	Predictors	Predictor Measures	Outcomes	Outcome Measures
Nadeau 2001 21163667	General: GA Other: Family adversity Index	Evaluated at 5 years 9 months, was developed using SES data such as the family status (two-parent, single-parent, blended), age of each parent, their respective levels of education, and professional occupations. 0=low ~ 7=high	**CNS:** Neurodevelopmental: Motor function Cognitive delay Behavioral disorders **Behavior**	Neuromotor development index: Huttenlocher neurological task test McCarthy Scales of Children's Abilities Behaviors were assessed by peers, teachers, and parents: RCP, TRF, parent's CBCL
Pierrat 2001 27221167	*CNS Predictors:* Periventricular leukomalacia (cystic) in ≤32 wk GA infants	Grade II - Transient periventricular densities, evolving into small cysts. Grade III - Transient periventricular densities, evolving into large cysts.	**CNS:** Neurodevelopmental: Motor delay Cerebral palsy	Motor delay - 12, 18, 24 month outcome as the protocol of Amiel-Tison and Stewart, and Touwen Criteria of Hagberg et al.

Evidence Table 3. Studies Evaluating Association of LBW and Cerebral Palsy and Neurological Outcomes
Part III

Author, Year	Associations found	Potential Biases	Comments
Leonard 1990 90204169	Neurologic abnormalities: Oxygen group (no IVH and no parenting risk): 0-29 days 9%, = 50 days 0%, p=NS among oxygen groups, total 6% IVH (no parenting risk factor): none 6%, Gr 1-II 0%, Gr III-IV 21% Parenting risk (no IVH): absent 6%, Present 17%, p=NS Cognitive deficits: Oxygen (no IVH and no parenting risk): 0-29 days 18%, = 50days 7%, total 17% IVH (no parenting risk factor): none 17%, Gr I-II 29%, Gr III-IV 50%, p < .005 between none and Gr III-IV groups Parenting risk (no IVH): Absent 17%, Present 75%, p<.001 NO cognitive risk factors: Low socioeconomic status with no parenting risk 74% Low socioeconomic status with parenting risk: 20% p<.02 Abnormal cognitive outcome (logistic regression): Oxygen: NS IVH: Grades 0-IV p= .0042, Gr I-II p=.18, Grade III-IV p=.003 Parenting risk with no IVH p= .0002 Low socioeconomic status p= .0107	Almost 30% dropout rate. Incomplete description of study groups No description of how neurodevelopmental assessment was done (who evaluated and were they blinded to the group). Conclusion that antenatal steroids and surfactant improves neurologic outcome is inappropriate since he had no control group that did not receive these treatments.	No data on funding source
Lucas 1992 92122860	Fortified breast-milk-fed vs. Minimally supplemented breast-milk-fed: Gross motor development/Knobloch scale: (Not significant) 102.7 ±1.8 ; 102.9±2 Language development/Knobloch scale: (Not significant) 92.6±0.9 ; 92.1±1.1 Social development: (Not significant) 104.6±1.1 ; 105.6±4 Motor development/Bayley: (Not significant) 92.3±1.6 ; 89.9±1.5 Mental development/Bayley: (Not significant) 106±2 ; 105.8±2 Social development/Vineland (Not significant) 118.9±1.7; 115.8±1.7	Not exclusively breast fed: in both groups total maternal intake was < 50 % breast milk with the Differential loss to follow up not reported-cannot determine BWT/GA of groups at follow-up	No data on funding source

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Author, Year	Associations found	Potential Biases	Comments
Robertson 1994 94181384	**CP** 500 –749 g (20) 1/20 750 –999 g (54) 6/59 1000-1249 g (84) 4/84 500-1249 g (163) 11/163 (**6.7%)** **Vision loss** 500 –749 g (20) 2/20 750 –999 g (54) 0/59 1000-1249 g (84) 0/84 500-1249 g (163) 2/163 (**1.2%)** **Hearosensory** 500 –749 g (20) 1/20 750 –999 g (54) 0/59 1000-1249 g (84) 1/84 500-1249 g (163) 2/163 (**1.2%)** **Mental retardation** 500 –749 g (20) 3/20 750 –999 g (54) 0/59 1000-1249 g (84) 0/84 500-1249 g (163) 3/163 (**1.8%)** **Convulsive disorder** 500 –749 g (20) 0/20 750 –999 g (54) 0/59 1000-1249 g (84) 0/84 500-1249 g (163) 0/163 (**0%)**	Does not give detailed characteristics of cohort	Study was private funded
Spinillo 1994 94257064 ***have some overlapped sample with spinillo, 1997**	Studied outcome of LBW infants after 3rd trimester bleeding. Controls were LBW's without 3rd trimester bleeding. Abruption, n = 40; previa, n= 22; unclassified bleeding, n = 15; controls, n = 153. Group Grade 3-4 IVH Cystic PVL Major handicap Poor Outcome Abruption 12.5%* 5% 11.1%+ OR = 3.9 (1.2, 2.1) Previa 13.6% 0 0 OR = 0.9 (0.2, 3.6) Unclassified 6.7% 0 0 OR = 0.6 (0.1, 0.3) Control 3.9% 0.6% 0.7% Reference group *P = 0.02 vs. control +P = 0.007 vs. control	Not all severe VLBW No information regarding frequenting of VLBW Bayley test score information no presented	No data on funding source

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Author, Year	Associations found	Potential Biases	Comments
Chen 1995 96009403	All of the LBW preterm infants with normal brain US finding (N=12) had "normal development". Two (17%) of them developed spastic CP. All of the LBW preterm infants with abnormal brain US finding (N=5) showed signs of spastic CP.	No reference of DDST Cases report without statistical analyses Vague or no definition of outcomes	No data on funding source
Goetz 1995 96119489	Tone abnormalities : (PVL) 12/12 Seizure disorder: (PVL) 1/12 Strabismus: (PVL) 3/12 Cognitive delay: (PVL) 6/12 mild 2/12 severe 4/12 They found cognitive delay in 6 of 12, seizures in 1 of 12 and strabismus in 3 of 12	Missing information Small sample	No data on funding source

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Author, Year	Associations found	Potential Biases	Comments
Speechley 1995 96356544	**General Health outcome:** Among boys around 12 yrs of age: NICU graduates as opposed to normal boys: 1) Are living with more chronic health problems 2) Are more likely to have a physical impairment 3) And have been hospitalized more often. Among girls around 12 yrs of age: NICU graduates as compared to normal girls: No statistically significant differences in their physical health outcome. Among NICU graduates, boys were not different from girls in their long-term physical health outcomes. **Emotional and Social well being outcomes:** Among girls around 12 yrs of age: NICU graduates as opposed to normal girls: 1) Had significantly lower social competence 2) Lower social support 3) And Lower self-esteem. Among boys around 12 yrs of age: NICU graduates as compared to normal boys: 1) They had no difference in their emotional or social well being. There was no interaction between family's socioeconomic status and long term outcomes among NICU graduates. Analytically: The **physical health outcomes** at 12 yrs were (**Boys NICU** grads vs Boys NNN grads/ **Girls NICU** grads vs Girls NNN grads) • Chronic physical health (mother's report): 2.8 vs 1.8 (p<0.005)/ 2.4 vs 1.3 • Lifetime hospitalizations (mother's report): 2.5 vs 1.6 (p<0.005)/ 1.7 vs 0.4 • Physical impairments (mother's report): 0.29 vs 0.10 (p<0.005)/ 0.22 vs 0.06 • Perception of child's heath (child's report): 21.6 vs 22.2/ 21.1 vs 21.9 • Perception of child's health (mother's report): 16.9 vs 17.7/ 16.8vs 18.0 **Emotional and social well being at 12 yrs:** (Boys NICU grads vs Boys NNN grads, Girls NICU grads vs Girls NNN grads) • Internalizing problems (child's report):15.3 vs 15.5/ 18.2 vs 14.8 • Externalizing problems (child's report): 15.9 vs 16.0 / 14.3 vs 13.5 • Social competence (child's report): 109.1 vs 113.9 / 101.7 vs 115.7 (p<0.005 • Social support (child's report): 81.6 vs 83.2/ 79.9 vs 86.1 (p<0.005) • Self esteem (child's report): 31.9 vs 32.4/ 29.8 vs 32.5 (p<0.005) • School performance (mother's report): 4.5 vs 4.6/ 4.8 vs 5.3	1) There is an Inconsistency in Mother's appreciation of their child's physical health: mothers of NICU graduate boys reported that their children had more physical impairments than NNN boy graduates; however, their overall perception of their child's health status was not any different from NNN boys graduates. 2) Some of the outcomes 3) Collected are prone to recollection bias (e.g., frequency of lifetime hospitalizations).	1) In this NICU cohort, only 36% of infants had BW<2500 g and only 5% had BW < 1500 gs, reflecting more NICU populations in the 70s and early 80s, than the current ones. 2) It is unclear whether statistically significant differences in psychometric scales reflect clinically significant differences in the emotional and social wellbeing of these children. 3) Given the fact of many negative findings, post hoc power analyses demonstrated that the study had an 80% power to detect a 40% difference between the 2 groups. 4) The fact that girls ex NICU graduates had a more substantial psychological effect than boys may reflect that girls are further into adolescence than the boys, experiencing the sequelae earlier. Thus in order to determine whether the differences observed are a temporary effect/related to adolescence, this cohort had to be followed further into their teenage years

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Author, Year	Associations found	Potential Biases	Comments
Wildin 1995 95385294 Wildin 1997 97422739 ***Data from same longitudinal study as Anderson, 1996 96314587 & Smith, 1996 97081985; overlapped sample**	High risk (HR) preterms, low risk (LR) preterms and full term controls. Most infants who were classified as high risk were classified as such due to BPD. Bayley MDI and PDI at 12 months corrected age: Group / n / Bayley MDI / Bayley PDI HR / 49 / 92.8 (24.9) / 89.8 (20.7) LR / 92 / 103.8 (16.3) / 99.1 (19.5) *Control / 114 / 108.2 (11.3) / 108.5 (12.3)* **In Hierarchical linear models analyses:** Cognitive/Bayley, Stanford-Binet Medical risk category LR (N=115) HR (N=69) Hierarchical linear model P=0.02 Rate of mental development/Bayley, Stanford-Binet Medical risk category LR (N=115) HR (N=69) P=0.0004 Socioeconomic status and cognitive/ Bayley Stanford-Binet association not significant. Medical risk category SES and rate of mental development/Bayley, Stanford-Binet association not significant. SES and rate of mental development/Bayley, Stanford-Binet association not significant. Motor development not significant	Preterm HR (high risk) Group: 84% were HR because of BPD only, so this groups is really a BPD group Many exclusion criteria Full developmental evaluation only done on a subgroup; others only partly examined Only analyzed infants retained through all 40 months Do not account for infants lost to follow-up Do not describe how group at 40 months differed in composition from group at enrollment. Use one-tailed test to achieve significance.	No data on funding source

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Author, Year	Associations found	Potential Biases	Comments
Anderson 1996 96314587 Smith 1996 97081985 (CNS+All) ***Data from same longitudinal study (U. of Texas Health Sciences Center in Houston and the U. of Texas Medical Branch in Galveston) as Wildin, 1995 & 1997; overlapped sample**	Cognitive Development (Bayley MDI) at 6 and 12 months, respectively: VLBW high risk (N=58): 100.7 (24.9), 92.8 (19.2) VLBW low risk (N=96): 106.8 (19.5), 103.8 (16.3) FT (N=119): 113.6 (15.8), 108.2 (11.3) Motor Development (Bayley PDI) at 6 and 12 months, respectively: VLBW high risk (N=58): 100.7 (24.9), 92.8 (19.2) VLBW low risk (N=96): 106.8 (19.5), 103.8 (16.3) FT (N=119): 113.6 (15.8), 108.2 (11.3) All groups differed significantly on MDI and PDI at 6 months (p<.001). At 12 months, only the high-risk infants differed from the term infants (p<.001). The means for all three groups at 6 and 12 months were within the normal range. However, significantly more high-risk infants fell within the moderately and severely delayed ranged than low-risk and term infants did (data not given) Total neurologic score at 6 and 12 months, respectively: VLBW high risk (N=58): 0.30 (0.23), 0.16 (0.22) VLBW low risk (N=96): 0.16 (0.17), 0.08 (0.12) FT (N=119): 0.05 (0.07), 0.04 (0.05) All groups differed significantly on total neurologic score at both 6 and 12 months (p<.001). Total score significantly improved from 6 to 12 months of age in all groups (p<.001). Total score in high-risk group still remained abnormal after improvement, while the score in low-risk and term infants were normal at 12 months of age. Assessed risk status in relation to outcome in areas of development of cognitive skills, communication development and daily living skills. Mental Age and daily living skills data are in months and language data are in raw scores: Language Infant status n Mental Age Daily living skills Expressive Receptive High risk 88 11.6 (2.4)* 11.9 (2.65) 18.0 (5.4)# 14.2 (2.6) Low risk 123 12.8 (1.7)* 12.97 (2.45) 20.5 (5.9) 15.3 (3.3) Full term 128 12.9 (1.1)* 13.29 (2.0) 20.6 (4.7)# 15.3 (2.4) *p < 0.01 for High risk v. low risk and full term # p < 0.01 for high risk v. full term Other differences are not significant.	Some comparison scores not shown The overwhelming majority of HR VLBW's were HR because of BPD with or without IVH Low socioeconomic status, inner city population	Study was government funded Significantly more abnormal neurologic scores at 12 month of age in VLBW high-risk infants compared to FT controls. Higher abnormal scores suggest degree of abnormality at 12 months depending on level of risk as neonate.

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Author, Year	Associations found	Potential Biases	Comments
Kato 1996 97182916	Independent predictors of CP/MR Fetal malpresentation vs. cephalic presentation (p<0.01) Use of tocolytics vs. no tocolytics (p<0.005) Umb cord artery pH<7.2 (p<0.05) Major handicap (CP/MR/Blindess) increased in VLBW infants delivered by breech/vag (25%) v. ceph/vag (0%) vs. Breech/c-section (5%) vs. cephalic/c-section (8.5%) (p<0.05)	Retrospective –completeness data (predictors/outcomes) not known. Predictors and outcomes poorly defined. No FT comparison.	No data on funding source
Katz 1996 97145056	**Attention deficit** is measured by the CPT test (error of omission). **Hyperactivity** and impulsivity is measured by the CPT test (error of commission). There were no differences among the preterm infants with mild, moderate and severe intracranial lesions. However, there was a significant increase in both errors of commission and omission in preterm with mild lesions compared to full term infants as well as in preterm with severe lesions compared to full term infants. With increasing severity of lesions in preterm infants, increasing percentage in each group commit errors of commission. Even in the absence of detectable intracranial lesions, preterm infants are still at higher risk for developing attention deficits than full term infants.	Exactly how FT controls were selected in an unbiased way is not described.	No data on funding source This study does not explore relationship of attention deficits identified with the CPT test with actual school performance and achievement in this group of preterm infants. This study includes older preterm 26-34 weeks and does not include the extremely preterm 24-25 wk infants.

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Author, Year	Associations found	Potential Biases	Comments
Korkman 1996 96374730 Psy1996	Overall: the VLBW/SGA group had the poorest test results. The VLBW/AGA group was somewhat less impaired, whereas the birth asphyxia group performed at the control group level Impairment when present tended to be diffuse in all groups, affecting: psychometric intelligence, naming, visuo-motor performance, tactile finger discrimination, attention and phonological analysis. Predictors evaluation for **CNS outcome** (**Intelligence evaluation**): 1) VLBW/AGA was associated with poorer WISC-R score, when compared to healthy full term (FT) ($p<0.05$) 2) VLBW/SGA was associated with poorer WISC-R score, when compared to healthy FT ($p<0.05$) 3) VLBW/SGA was associated with poorer WISC-R score when compared to asphyxiated term infants (There was no difference in the scores between asphyxiated terms and healthy terms) Predictors evaluation for **CNS outcome** (**Neuropsychological evaluation):** 1) VLBW/SGA was associated with poorer NEPSY score ($p<0.05$) when compared to healthy FT 2) In the VLBW cohort, impairment when present tended to be diffuse (in all items examined). 3) VLBW/SGA was associated with poorer NEPSY score when compared to asphyxiated terms. Overall In the VLBW group (AGA and SGA) (n=77): 1) Apgar scores were not correlated with outcome measures 2) Arteria PH was correlated with FSIQ score 3) Intrauterine growth retardation correlated with NEPSY score 4) BW correlated with NEPSY score 5) There was no correlation between RDS, IVH , duration ofventilatory tx and cognitive dysfunction **Combined CNS / Ophthalmology outcome:** 1) VLBW/AGA: 21% (both mild and severe) 2) VLBW/SGA : 6/34 (18%) (mostly lids) 3) Birth asphyxia/ Term: 7/32 (22%) (mostly severe)	1) Cannot exclude potential selection bias (no description of patient flow in each group) 2) Cannot exclude diagnosis bias/no information on blinding of personnel evaluating developmental outcome component on PMHx. 3) The authors investigated associations between 7 predictors and many outcomes (the different subcomponents of WISC-R test and the NEPSY test)/ thus cannot exclude "multiple comparison" effect	Supported by non-governmental foundations

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Author, Year	Associations found	Potential Biases	Comments
Lucas 1996 96302121	Predictor evaluation for **CNS outcomes**: (Unadjusted analysis) Mother's choice to breast feed was associated with higher IQ scores at 7 years: (No mother's milk group vs Mother's milk group) • WISC-R verbal scale (mean): 92.0 vs 102.1 (p<0.001) • WISC-R Performance scale : 93.2 vs 103.3 (p<0.001) • Overall IQ: 92.8 vs 103.0 (p<0.001) (Adjusted regression analysis for confounders) Mothers choice to Breast feed infant: N=210 babies • Higher Verbal scale scores: (p<0.001) • Higher Performance scale scores (p< 0.0001) • Higher Overall IQ: (p<0.0001) Successfully breast fed infants only: (Received breast milk) N=193 babies • Higher Verbal scale scores: (p<0.0001) • Higher Performance scale scores (<0.0001) • Higher Overall IQ: (p<0.0001) Overall (Regression analysis) • Whether Received breast milk: offered advantage of 8.3 points (p<0.001) • Social class: -3.5/class (p<0.004) • Mother's education: 2.0/ group (p=0.01) • Female sex (p=0.01) • Days of ventilation: -2.6/ week (p=0.02)	Cannot exclude false association due to unrecognized confounders between the 2 groups as this study was non-randomized (despite matching for BW, GA, need for ventilation, NICU stay and other diets ; there are still exist important unconsidered confounders)	

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Author, Year	Associations found	Potential Biases	Comments
Rieck 1996 Psy 1996 06905005	In Prospective longitudinal component of the study: Predictor evaluation for **CNS** outcome: 1) Female Sex, HC percentile and Maternal education were independently associated with CGI score (r^2= 0.41, p< 0.001) 2) Age at assessment, GA and HC percentile were independently associated with Verbal scale score. (r^2= 0.36, p< 0.001) 3) HC percentile was independently associated with Perception-performance score (r2= 0.12, p< 0.05) 4) Neurologic complication and HC percentile were independently associated with Quantitative scale score (r2= 0.30, p< 0.01) 5) Neurologic complications and HC percentile were independently associated with Memory scale score (r2= 0.36, p< 0.05) 6) HC's percentile were associated with higher scores in the 4 scales of McCarthy's test and in the GCI . (p<0.05) In Cross sectional component of the study: Predictor evaluation for **CNS** outcome: 1) VLBW children with normal IQ, score significantly lower than the Middle class group on many cognitive tasks, and may demonstrate more learning disabilities than Middle class children 2) VLBW and Low Class children had significantly lower score in all scales of McCarthy's test , as compared to Middle Class children. (p<0.01) 3) VLBW had no different scores from Low class children. 4) Evaluation of the change of scores with age revealed that from age 3-7 yrs, VLBW advanced significantly less than Middle class children in Word Knowledge, Conceptual grouping and Numerical Memory backwards. 5) The gap between the scores of the 2 groups increased with age.	1) There was no matching, except for the age between VLBW and MC, LC children. Thus, there was no control for possible confounders, 2) Selection bias might exists: As only those that had completed the test were analyzed. (Only 58% of VLBW children had completed the test) 3) Selection bias also might exist as no information is given in the selection process of the 103 VLBW infants that had participated in the original study	1) No data on the absolute size of the association between predictors and outcomes were given. 2) Statistically significant correlation does not always mean a clinically significant association.

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Author, Year	Associations found	Potential Biases	Comments
Whitaker 1996 97040639	MR higher in LBW<2kg (5%) than in general pop distribution (2.5%) OR for MR vs Normal Intelligence: PVL/VE OR 65.83 (19.1-227.4) Isolated GMH/IVH OR 4.64(1.2-18.6) Verbal reasoning (Stanford-Binet area score) p<0.05 PVL/VE: 98.9 (10.8) GMH/IVH 102.9 (10.5) No abnormality 104.3 (10.9) Visual perception organization All abstract visual reasoning, visual-motor integration, and visual-perceptual stills were significantly (p<0.01 or p<0.005) were significantly lower for children who had PVL/VE compared to those with isolated GMH/IVH or No abnormality. 50% of MR attributable to PVL/VE independent of other factors.	(None)	Study was government and privately funded

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Author, Year	Associations found	Potential Biases	Comments
Blitz 1997 97154301	Developmental outcome: The mean MDI, PID, CLAMS Total, Expressive, and Receptive scores were 99.7 (19.8), 88.9 (19.8), 94.9 (23.0), 90.8 (26.2), and 99.7 (21.3), respectively. MDI < 70 9% PDI < 70 18% Language delay (>1 SD below the mean) 34% Significant language delay (>2 SD below the mean)12% Multiple regression analysis showed BW and surfactant did not relate to developmental outcome. BPD, PVL and IVH significantly increased the risk of impairment. PVL, BPD, seizures and hydrocephalus account for 29.7% of the variance on the MDI scores (F=10.05, p<. 001). PVL, IVH, and BPD accounted for 23 % of the variance on the PDI scores (F=9.6, p < .001). For the total CLAMS score, 11% of the variance was accounted for by PVL and BPD (F= 7.1, p < .002) Neurologic outcome: Multiple regression analysis showed low BW was not associated with neurological impairment. On the contrary, BPD and PVL significantly increased the risk (14.8% if variance; F=8.4, p<. 001). No other individual variables reach the significance level. CP: present 24 %, suspect 27%, No CP 49% Audiology: Hearing loss 16%. None of the children were profoundly hearing-impaired. Visual problem 18%. None were clinically blind	36% declined or did not appear (possible selection bias). Language assessment at 2 years is too early to determine more subtle language delays. No control group.	No data on funding source
Cheung 1997 97310950	Of the 21 preterms with IVH treated with rescue HFO, 8 (38%) has neurodevelopmental disabilities. Of the 8 preterms with grade III or IV IVH treated with rescue HFO, 6 (75%) has neurodevelopmental disabilities.	The title is “High Frequency Oscillatory Ventilation” but the authors state that a high frequency flow interrupt ventilator is used in their nursery. These distinct modes of ventilation should not be confused 60% mortality among cohort meeting inclusion criteria Time of follow-up not well standardized	No data on funding source

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Author, Year	Associations found	Potential Biases	Comments
Ekert 1997 97251211	Association between outcome (CP and/or developmental delay) and perinatal/neonatal variables: Multiple logistic regression analysis showed that only PVL was associated with abnormal outcome (PLV: p=0.0001)	(None)	Study was government funded

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Author, Year	Associations found	Potential Biases	Comments
Gerner 1997 97329414	Predictors evaluation for **CNS outcome:** 1) Healthy preterms did not differ significantly in psychodevelopmental outcome 2) Prematurity was not associated with the sum score in the Griffith's test 3) Prematurity was associated only with lower score Hand-Eye coordination scale 4) The predictors associated with poor psychodevelopmental outcome in preterms were (univariate analysis): General predictors: Low GA: Pearson correlation coefficient r= 0.19 (171 pts) (p< 0.05); Low BW: Pearson correlation coefficient r= 0.25 (171 pts) (p< 0.001); Intraventricular hemorrhage (IVH) + ventricular dilatation: Pearson correlation coefficient r= -0.27 (p< 0.001) CNS predictors: Periventricular Cystic leukomalacia, (PVL) r= -0.24 (p< 0.01); B1-3 + W1-4 U/S findings, r= -0.27 (p< 0.001) Cardiovascular predictors: PDA (n=72 pts), r= -0.32 (p< 0.001) Pulmonary predictors: Prolonged ventilatory therapy (n-94 pts), r= -0.39 (p< 0.001); CLD: (n=56 pts), r= -0.26 (p< 0.001) 5) Although the screening indicated that several risk factors were associated with adverse neurodevelopmental outcome- in the multiple regression model the contribution of individual variables was very low (less than 20%). 80% of the outcome variance still remained unexplained. 6) Only predictors independently associated with total sum score in Griffith's test were (multivariate analysis): combination contributed to outcome variance by 21%: Pulmonary predictors: Duration of ventilatory tx (r^2=16%) and CNS: PVL (r^2=5%) 7) Predictors independently associated with scores of individual subscales: Locomotor subscale : combination contributed to outcome variance by 14% • Duration of ventilatory tx (r^2=9%), PVL (r^2=5%) Personal-Social subscale: combination contributed to outcome variance by 17% • BW (r^2=10%), PVL (r^2=7%) Hearing and speech subscale: • Duration of ventilatory tx (r^2=13%) Hand and eye coordination subscale: combination contributed to outcome variance by 15% • PDA requiring surgical ligation (r2=11%), • Hemorrhage plus White matter lesions (r^2=4%) Performance subscale: combination contributed to outcome variance by 18% • Duration of Ventilatory tx (r^2=12%) and White matter lesions (r^2=6%)	1) In the comparative components (Group A vs C and Group B vs A), there was no control for possible confounders, as not appropriate matching was done between these compared groups 2) Cannot exclude diagnosis bias as no information is given about blinding of personnel performing the neurodevelopmental assessment on the infants' risk factors 3) Two many predictors investigated (28) for the total number of patients in the VLBW group (cannot exclude false associations found in the regression analysis) 4) Cannot exclude false associations due to chance, as multiple subgroup analyses were done (subclasses of Griffith's test) 5) The subclasses of Griffith's test have limited specificity, thus limited differentiating capacity at 10 months of age and especially for infants with neonatal complications as performance in one scale requires skills assessed in another scale.	Supported by non-governmental Foundations.

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Author, Year	Associations found	Potential Biases	Comments
Koller 1997 97193708	***Cognitive Development:*** Birth weight: P <0.001 Gestational age: P<0.001 Neonatal health index: P<0.01 Neurological status @ 1 yr: P <0.001 Male gender: P <0.005 Maternal education: P<0.005	Selection bias-does not include all VLBW infants- only those for whom all follow-up data are available--how are these different from the ones who did not show for follow-up?	Study was government funded
Murphy 1997 97192793	Apgar score <3 at 5minutes - 5.3% cerebral palsy Patent ductus arteriousus - 2.0% cerebral palsy Hypotension - 2.2% cerebral palsy Transfusion - 3.2% cerebral palsy Prolonged ventilation - 2.7% cerebral palsy Pneumothorax - 3.4% cerebral palsy Sepsis - 2.8 % cerebral palsy Total parenteral nutrition – 3.0% cerebral palsy Hyponatremia - 6.8% cerebral palsy Chorioamnionitis and neonatal sepsis - 7.1% cerebral palsy Any maternal infection and neonatal sepsis - 4.2% cerebral palsy Seizure - 10.0% cerebral palsy Parenchymal damage - 32.0% cerebral palsy	Ascertainment of CP was from registry--not examined as part of study Absence of CP was not obtained by exam as part of study Multiply definitions of predictor variables not reported Retrospective acquirement of risk factors-no standard definitions	Study was privately funded
Schendel 1997 98033417	Even apparently well VLBW with no overt physical impairment are consistently at higher risk for all measures of DELAY than MLBW or NBW infants. VLBW have DELAY in all areas of function with greatest risk for delay in gross motor domain. **"Abnormal"** – VLBW 10.9%, NBW 2.9%, p = 0.001 Personal-Social =1 delays: VLBW 7.1%, NBW 2.2%, p = 0.001 **Language = 1delays**: VLBW 8.8%, NBW 4%, p = 0.01 **Fine motor-adaptive = 1 delays**: VLBW 7.9%, NBW 2.2%, p = 0.001 **Gross motor =1 delays**: VLBW 10.7%, NBW 1.8%, p = 0.001	The people administering the Denver test were not blinded and were aware of degree of prematurity and this is a major source of bias. The adjusted age at f/u had very wide range 9-34 months	Study was government funded

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Author, Year	Associations found	Potential Biases	Comments
Thompson 1997 97268338	Neurobiologic risk score (NBRS) investigated to determine predictive value for performance on McCarthy Scales at 4 years age. N = 55. McCarthy Scale / Mean (SD) / Range General cognitive index / 89 (20) / 49-126 Verbal / 44 (10) / 21-65 Perceptual-Performance / 44 (12) / 21-69 Quantitative / 46 (12) / 22-67 Memory / 46(10) / 21-67 Motor / 42 (12) / 20-70 Also: The NBRS was not found to be predictive of the McCarthy General Cognitive Index; in multiple regression analysis only birth weight, gestational age and gender were significantly related to the McCarthy scores.	One institution No control group Combined high NBRS and intermediate NRS patients into one group	Study was government funded
Victorian Infant Collaborative study Group 1997 98026322 ***There are a series of Victorian articles in LBW-ALL.** ***This study will be combined in LBW-ALL table**	Birth weight < 1000g; assessed at 2 years corrected age. Cohort / n / DQ < -3 SD / DQ –3 to –2 SD / DQ –2 to –1 SD / DQ> -1 SD '91-'92 / 237 / 5.9% / 6.3% / 13.9% / 73.4% '85-'87 / 211 / 6.2% / 4.3% / 14.2% / 75.4% Cohort / n / Mild CP / Mod. CP / Severe CP / Any CP / Blindness / Deaf '91-'92 / 237 / 3.8% / 1.7% / 3.8% / 9.3% / 2.1% / 0.8% '85-'87 / 211 / NS / NS / NS / 6.6% / 4.3% / 0.5% Cohort / No disability / Mild Disability / Moderate disability / Severe disability '91-92 n = 237 / 71.3% / 14.8% / 7.2% / 6.8% '85-'87 n = 211 / 71.6% / 15.6% / 6.2% / 6.6%	Incomplete reporting of demographic data, methods and results.	Study was government funded

Evidence Table 3. Studies Evaluating Association of LBW and Cerebral Palsy and Neurological Outcomes
Part III

Author, Year	Associations found	Potential Biases	Comments
Battin 1998 99002694	**CNS outcomes:** Major impairment was present in 36% of infants born at 23-25 wks GA, during 1991-1993 (N=44) 1) Cerebral palsy 9/44 (20%) 2) Low MDI 8/44 (18%) **Ophthalmology** outcome: 1) Blind 4/44 (9%) **Audiology** outcome: 1) Deaf 4/44 (9%) **Combined** outcome: 1) Overall impaired 16/44 (36%) 2) Multiple handicaps 6/16 (38%) Analysis of only 24-25 wks GA infants (N=43): Major handicaps: 15/44 (34%) The percentage of infants with major impairments and/ or multiple handicaps, for the 23-25 wks GA group, was the same in 1991-1993 and 1983-1989 periods (However, no data on the number of infants from this cohort that were actually followed up at 18 mo of age)	1) During 1991-93 period there is no concurrent control group for the comparative assessment of neurodevelopmental outcome 2) Group of infants of 23-25 wks GA, born during 1991-1993, was not matched to the historical control group born during 1983-1989. Possibility of confounders cannot be excluded. 3) No data were given on the number of infants in the historical control group that had f/up at 18 mo of age.	No report on source of funding
Bos 1998 98218970	The developmental course of the quality of general movements significantly correlated only with the duration of parieto-occipital echodensities (r=0.482, p<.02), while the duration of PVE frontal was not associated with the developmental outcome (r=0.241, NS)	No power estimates for defecting modest effects	No data on funding source
Cherkes-Julkowski 1998 98262696	No disorder identified: PT 25%, FT 75 % Attention deficit disorder: PT 17.8%, FT 7.1% Learning disability: PT 17.8%, FT 14.2% Language impairment: PT 3.5%, FT 0% Neurological impairment: PT 7.1%, FT 0% School concerns: PT 28.5%, FT 21.4% This group of only mildly preterm, seemingly healthy PT infants have significantly more disability than expected $\chi 2(5)=62.577$, p= .0001	Evaluators were people in the community and social system so that there may be significant variations in evaluations. Sample size too small for statistical analysis.	No data on funding source This study is more a study of predictability of the attention deployment test in identifying minimal brain dysfunction at 13 and 15 mos, rather than a study of predictors of long-term outcome.

Evidence Table 3. Studies Evaluating Association of LBW and Cerebral Palsy and Neurological Outcomes
Part III

Author, Year	Associations found	Potential Biases	Comments
Emsley 1998 98238139 (CNS+ All)	**Disability in 1st cohort 1984-1989 of 23-25 wks**: Any disability: 38% CP: 21% **Data on 2nd cohort 1990-1994 of 23-25 wks:** CP: 18% Blindness due to ROP: 18%, Myopia: 15%, Squint: 13% Developmental delay (DQ < 70): 15% Deafness: 3 % Epileptic seizures: 0 Speech delay: 15% Clumsy, learning difficulties, behavioral disorder: 3% Disability: Mild 38%, Moderate 13%, Severe 18% **Infants with disability have lower GA, worse CRIB** scores and significant cranial ultrasound findings. In comparing the 2 cohorts, increased survival is associated with increased disability but mostly mild disability. No significant change in %CP. High CRIB score assoc. with disability.	Sample numbers small. Does not state when the assessments were carried out and whether the evaluators were blinded to the GA and history of the infants.	No data on funding source

Evidence Table 3. Studies Evaluating Association of LBW and Cerebral Palsy and Neurological Outcomes
Part III

Author, Year	Associations found	Potential Biases	Comments
Pasman 1998 98196839	Assessment at 5 to 7 years of age. Full-term (FT) controls, neurologically normal low risk preterm (normal LR) infants, neurologically abnormal low risk preterm infants (abnormal LR), and high-risk preterm infants (HR). Risk classification was based on the neonatal neurologic inventory. Group / n / Total IQ / Verbal IQ / Performance IQ FT: 18 / 114 (17) / 113 (18) / 111 (14) Normal LR w/ GA 25-30 weeks: 15 / 108 (15) / 107 (16) / 106 (11) Normal LR w/ GA 31-34 weeks : 21 / 113 (15) / 114 (18) / 107 (10) Abnormal LR w/GA 25-34 weeks: 8 / 99 (12) / 104 (12) / 93 (14) HR w/ GA 25-34 weeks: 9 / 78 (20) / 79 (19) / 81 (19) HR infants excluded from statistical analysis. Term infants vs. all low risk infants: Total IQ, no significant difference. Verbal IQ, no significant difference. Performance IQ P = 0.02.	Year of birth not given Small numbers in subgroups (e.g., 8,9) Incomplete reporting of results	Study was privately funded
Rogers 1998 98438124	There are no association between GA, BW, BPD Length of stay with growth failure P>0.05 Growth failure with CPVL 16/41 CP with CPVL 39/41	(None)	Study was privately funded

Evidence Table 3. Studies Evaluating Association of LBW and Cerebral Palsy and Neurological Outcomes
Part III

Author, Year	Associations found	Potential Biases	Comments
Spinillo 1998 98237382 Spinillo, 1997 98021316 & 97277958 ***have some overlapped sample with spinillo, 1994**	**CP prevalence** 12.3% in 24-33 wk preemies **Minor neurologic problems (abnormal tone or reflex but functionally normal) or borderline (71-84) Bayley MDI** : 16.1% **Factors assoc with increased CP:** PROM > 48 hrs OR 2.98 (1.12-7.96 CI 95th) Meconium-stained amniotic fluid OR 4.36 (1.69-11.2) Male sex OR 3.01 (1.32-6.71) Decreasing gestation: CP 22.2% in 24-25 wks, 23.1% in 26-27 wks, 14.5% in 28-29 %, 8.3% in 30-31 wks, 9.3% in 32-33 wk infants. CP Meconium-stained fluid (N=17) 41% (7/17%) Clear fluid (N=246) 13.4% (33/246) P=0.06 **CNS outcome:** 1) The incidence of cerebral palsy in this cohort of preterm infants was : 40/345: (12%), but this refer only to those survived: 391/450 (87%) and to those that completed the 2 yr f/up: 345/450 (77%) Predictors evaluation for **Survival at 2 yrs:** 1) Survival at 2 yrs was associated with higher GA (p<0.0001), higher BW, (p<0.0001) And History of fewer previous abortions. Predictors evaluation of **CNS outcomes**: (In a univariate analysis) From the maternal and neonatal characteristics and the pregnancy complication/predictors, those found to be associated with CP were Odds Ratio (95% CI) 1) Higher Maternal age 1.07 (1.0-1.15) 2) Lower GA 0.87 (0.76-0.99) 3) Lower BW 0.94 (0.87-1.00) 4) male gender 2.65 (1.28-5.50) 5) More Previous voluntary abortion (25% vs 7%) 4.51 (1.94-10.5) 6) Preeclampsia (5% vs 19%) 0.22 (0.05-0.94) In a multivariate regression model (including maternal age, BW Standard deviation score, GA and preeclampsia) only preeclampsia was independently associated with the risk of cerebral palsy: OR: 0.16 (0.04-0.74) The authors conclude a protective effect of preeclampsia against CP, in the absence of Mg sulfate utilization	1) Major confounding postnatal factors such as BPD, IVH, and PVL, which may be associated with CP, were not controlled for. 2) We cannot exclude selection bias. The associations found were relevant to the group of surviving infants with cerebral palsy who also had f/up at 2 yrs. A large number of infants were excluded from the analysis: 46 infants that were lost to f/up and 59 that had died.	No data on funding source

Evidence Table 3. Studies Evaluating Association of LBW and Cerebral Palsy and Neurological Outcomes
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Author, Year	Associations found	Potential Biases	Comments
Tin 1998 99046171	**Result of 1983 cohort at 6 years:** *Severe disability:* Sample 1: 4.4%, Sample 2 : 2.1%, Sample 3: 50% *IQ < 75 without sensorimotor disability:* Sample 1 : 4.9%, Sample 2 : 0, Sample 3 : 25% *Severe sensorimotor disability:* Sample 1 : 5.9%, Sample 2 : 21.4%, Sample 3 : 41.7% *Severe sensorimotor or cognitive disability:* Sample 1 : 8.4% (5 - 13.1%, 95% CI) Sample 2 : 21.4% (4.7-50.8%) Sample 3: 41.7% (15.2-72.3%) **Result of 1990 cohort at 2 years:** *Severe disability:* Sample 1: 7.9%, Sample 2: 15.4%, Sample 3: 57.1% **High f/u rate is critical because it may underestimate incidence of the outcome.**	No definitions of outcome, incomplete methods description, wrong reference	Study was privately funded
Burguet 1999 99126269	In univariate analysis: The prevalence of CP in LBW preemies with RDS (N=66) was 20%, compared to 9% in preemies without RDS (N=101). The difference was significant (p=0.04) Incidence of CP 7% in no PROM, 20% in PROM < 48 hrs, 30% in PROM 48h to 7 days, 11% in PROM >7 days, χ^2 trend: p= .004 In multivariate analysis: Controlling for environmental and maternal factors, the risk of CP was about 3 times in preemies with RDS, than preemies without RDS (adjusted OR 2.8, 95% CI 1.1-7.1). "The introduction of surfactant in the second stage of our study was not shown to have any impact on the incidence of CP among the children of this cohort." PROM = 48 hours (OR 4.3, 95% CI 1.6-11.8), p= .005 Monochorionic twin placentation (OR 6.0, 1.7-21.3), p = .007 RDS (OR 2.8, 1.1-7.1) PROM +, PTL + (OR 7.5, 2.2-26.2), p= .001	8% BW>2000g Nonstandard definition of CP Suspected infant (mild hypotonia or delay to normal acquisition) were included in the normal group Evaluations done by community physician of parents' choice so, no standardization, and unblinded Used uncorrected age	No data on funding source Severe disability is common among extremely preterm infants of GA 22-25 wk

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Author, Year	Associations found	Potential Biases	Comments
Cooke 1999 99257637	CP prevalences: 1982-5 (411) 45 10.9% 1986-9 (387) 42 10.9% 1990-3 (398) 29 7.3% P=0.046	ND	No data on funding source
Cooke 1999 99380719	MRI abnormality: VLBW group : 37/87 (42.5%) FT Control group: 0/8 (0%) Abnormal MRI not associated with ADHA, IQ, or motor coordination scores.	No statistical/ data analysis section Few controls (n=8) Disagree and interpretation (i.e. conclusion)	Study was privately funded Overall sample of LBW<2 kg had increased rate of MR compared to gen pop. PVL/VE was independently related to MR (OR 66) and to borderline IQ . Among children with nl IQ, those with PVL/VE vs. no PVL/VE performed more poorly on visual-perceptual organization. White matter injury is associated with adverse cognitive and visual perceptual disability.

Evidence Table 3. Studies Evaluating Association of LBW and Cerebral Palsy and Neurological Outcomes
Part III

Author, Year	Associations found	Potential Biases	Comments
Finer 1999 99436635	**IVH:** Sample 1: 70%, Sample 2 : 10%, p = .015. **Normal neuromotor outcome**: Sample 1: 70 %, Sample 2: 70%. *Abnormal neuromotor outcome:* Sample 1 : 20%, Sample 2: 0 *Normal developmental outcome:* Sample 1: 80%, Sample 2: 60% *Abnormal developmental outcome:* Sample 1: 20%, Sample 2: 20% *Normal neurodevelopmetal outcome:* Sample 1: 70%, Sample 2 60% No difference in developmental scores of following domains: composite mental, composite motor, adaptive, language, personal/social, fine motor, gross motor. They conclude that intact survival is possible for infants weighting <750 g who received CPR in the DR.	Very small sample size with 28% lost to f/u. Results are from a single center, difficult to generalize the results. Exact criteria for chest compressions and epinephrine not specified No information about the evaluators or whether they were blinded. Infants evaluated at wide range of ages where infants seen later may have done better or worse	No data on funding source Missing information Retrospective collection of breast feeding data

Evidence Table 3. Studies Evaluating Association of LBW and Cerebral Palsy and Neurological Outcomes
Part III

Author, Year	Associations found	Potential Biases	Comments
Futagi 1999 99450356	Predictor evaluation for **CNS outcome**: 1) Birth in surfactant era was not associated with neurodevelopmental outcome (good or poor prognosis) for infants of less than 1000 gms (Pre-surfactant era[107] vs surfactant era [169] • Neurodevelopmental outcome: 71/107 (66%) vs 100/169 (59%) • Cerebral palsy: 13/107 (12%) vs 18/169 (11%) • Mental retardation: 11/107 (10%) vs 16/169 (9.5%) • Borderline intelligence: 11/107 (10%) vs 35/169 (21%) 2) Birth in surfactant era was associated with higher incidence of borderline intelligence (20.6% in surfactant era vs 10.3% in pre-surfactant era) 3) Birth in surfactant era :was not associated with DQ or IQ scores in the individual neurodevelopmental categories (normal neurodevelopmentally, cerebral palsy, mental retardation, borderline intelligence) • Normal: 99.7 vs 100.1 • Cerebral palsy: 57.5 vs 62.5 • Mental retardation: 62.4 vs 55.1 • Borderline intelligence: 77.1 vs 77.6 4) Birth in surfactant era: was not associated with the distribution of subtypes of cerebral palsy.(spastic diplegia, spastic hemiplegia, spastic quadriplegia) 5) Birth in surfactant era was not associated with severity of cerebral palsy.(minimal, mild, moderate, severe)	1) Assessed the association between birth in the surfactant era and neurodevelopmental outcome and not of surfactant administration itself problems of ecological fallacy in that type of studies) 2) It is unknown if the results of this study could be generalized in other NICU populations where more than 50% of infants receive surfactant 3) The possibility of a masked association cannot be excluded due to existence of possible cofounders in the 2 groups. 4) Many subgroup exploratory analyses were performed that were not described in the Method section	Source of funding not reported
Kim 1999 99416608	Infants with BW < 2000g. Assessed at 12 months age. Risk Factor / CP / Devel. Delay / Both CP+DD / Neither Neonatal sepsis / 4/9* / 1/8 / 5/17* / 4/62 BPD / 4/9* / 3/8* / 7/17* / 9/62 IVH > grade 2 / 4/9* / 1/8 / 5/17* / 6/62 Days on ventilator / 18.1 (25.1)* / 11.3 (8.7)* / 12.2 (19.6)* / 3.3 (3.3) Ventriculomegaly / 5/9* / 0 / 5/17 / 8/62 P < 0.05 vs. neither CP/ DD Multivariate logistic regression, the following were not significant risk factors: Apgar score at 5 minutes, BPD, IVH, PDA, duration of mechanical ventilation, Sepsis	Study group as a whole is not described- only those infants developing CP CP infants are compared to "controls", but no description of how the control group was recruited or in what ways they were similar to or different from the study group. Concurrent? Historical? Matched for gestational age or birth weight? We are not told. Leaves open the possibility of massive bias/confounding.	In this cohortof preterm infants (BW 600-1250 grams) <1%blind or deaf; 1%- 3% had seizure disorder; and 7% had CP. Full scale IQ <80 occurred in 28% of total sample (BW 600-1250 grams) at 54 months follow-up

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Author, Year	Associations found				Potential Biases	Comments
Krageloh-Mann 1999 99431017		*MRI normal (n=10)(%)*	*MRI abnormal (n=19)(%)*	*P*	1) Selection of preterm subject bias 2) No MRI of controls 3) Controls, "From Copewnagen suburb"- well matched with regard to SES, health-care measures, etc.? 4) Design is bizarre, complicated, and difficult to interpret. 5) Statistical analysis is not well described. It appears that they did not correct for multiple comparisons, which renders their positive findings suspect. They did not do a power analysis, which renders their negative findings suspect. 6) Much of the paper analyzes association between outcomes evident at 5-7 yrs f/u, for ex., association between abnormal MRI at 5 yr. And IQ at 5 yr.; this does not examine association between neonatal MRI+ IQ at 5 yr.	No data on funding source
	Preeclampsia	50	11	0.03		
	Placental abruption	0	32	0.07		
	Mechanical Ventilation>7d	0	42	0.03		
	ICH grades III + III	0	16	0.53		
	DO2 <ml O2/100g/min	12.5%	63%	0.03		
Salokorpi 1999 99353226	Assessed selected risk factor in relation to cerebral palsy (CP) diagnosed at two years age. CP present, n = 27; CP absent, n = 116.					Study was privately funded
	Risk Factor		Odds ratio (CI)			
	Grade 3 or four IVH on head sonogram		7.94 (2.75, 22.95)			
	Hypotension		1.26 (0.47, 3.35)			
	Hypocarbia		2.20 (0.77, 6.31)			
	Also found no association between average duration of ventilation and CP.					

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Author, Year	Associations found	Potential Biases	Comments
Shepherd 1999 99165413	CP 9% in this group of preemies who were followed-up at least once after term age (N=53) Of the 5 infants with CP, 3 had abnormal VEP. Of those without CP, 4 had abnormal VEP. Sensitivity of VEP before term for CP = 60%. Specificity is 92%. Positive predictive value of abnormal VEP for CP is 43%. Negative predictive value is 96%.	CP not defined. CP evaluated by generalists with no uniform definition. Incomplete Methods and large number of missing information.	No data on funding source
Stathis 1999 99325758	Head circumference category at 8 months corrected age related to learning delay greater than one year when assessed at 6 years: HC Category / n / % with delay < 3rd percentile / 23 / 61% (39, 80) 3rd to 10th / 13 / 77% (46, 95) P = 0.004 > 10th / 40 / 30% (17, 47) Head circumference category at 12 months CA did predict McCarthy General Cognitive index at six years, but head circumference category at 24 months CA did not significantly predict McCarthy CGI at 6 years. Head circumference and head growth velocity was not shown to have a relationship with attention deficit hyperactivity disorder. Head circumference category < 10th vs. greater than 10th percentile at four and 8 months corrected age were significantly associated with McCarthy CGI at 6 years age	One nursery High rate of patients lost to follow-up (30%) Small numbers: limited ability to detect small differences; high chances of type 2 error	Study was privately funded

Evidence Table 3. Studies Evaluating Association of LBW and Cerebral Palsy and Neurological Outcomes
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Author, Year	Associations found	Potential Biases	Comments
Vohr 1999 99332101	**Normal Neurologic Examination:** 75% CP overall: 17% but 29% in 401-500 g babies CP (quadriplegia): 6.4% CP (left hemiplegia): 0.45% CP (right hemiplegia): 0.91% CP (diplegia): 8.2% **Seizure disorder**: 5% Hydrocephalus with shunt: 4% Visual impairment (any): 9% Unilateral blindness: 1% overall but 7 % in 401-500g and 801-900g babies **Bilateral blindness**: 2 % overall but 14 % in 401-500 g babies Legally blind in one or both eyes: 3% Hearing impairment: overall 11 % Wearing hearing aids: overall 3 % **Sits unsupported:** 93% Sits well alone: 86% Walks: 83%, Walks fluently: 70% Independently feeds self: 80% **Bayley MDI** < 85 : 66%, Bayley MDI <70: 37% Bayley PDI <85: 57%, Bayley PDI <70: 29% Chronic lung disease, grades 3-4 IVH/PVL, steroids for CLD, NEC, and male gender associated with increased risk for morbidity	Poor f/u rate of 78% and this may significantly underestimate outcome.	

Evidence Table 3. Studies Evaluating Association of LBW and Cerebral Palsy and Neurological Outcomes
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Author, Year	Associations found	Potential Biases	Comments
Agustines 2000 20279724	Predictors for **CNS outcome**: Rates of developmental delay at 30 months of corrected age, were significant among extremely VLBW infants 500-750 g Overall **CNS outcomes** in the 36 infants: 1) Normal MDI: 32% 2) Mild delay in MDI: 40% 3) Severe Delay in MDI: 28% 4) Combined mild and severe delay in MDI: 58% 5) Normal PDI: 42% 6) Mild delay in PDI: 16% 7) Severe delay in PDI: 42% 8) Combined mild and severe delay in PDI: 58% Stratified by GA: (24 wks N=14) (25 wks N=14) (26-29 N=8) 1) Normal MDI: 11% 50% 33% 2) Mild delay in MDI: 55% 25% 50% 3) Severe Delay in MDI: 33% 25% 17% 4) Combined mild and severe delay in MDI: 88% 50% 67% 5) Normal PDI: 34% 50% 0% 6) Mild delay in PDI: 22% 0% 20% 7) Severe delay in PDI: 44% 50% 80% 8) Combined mild and severe delay in PDI: 68% 50% 100%	1) Long term f/up for only 57% (36/63 infants that had survived) Those who had f/up had less morbidity than those lost to f/up (incidence of RDS was 47% vs 92% in lost to f/up group) 2) There was no control group to compare outcomes of extremely VLBW with VLBW infants. 3) Stratified analysis for outcome in different GA subgroups had very few patients in each subgroup, thus the confidence intervals are very wide. 4) This study was not designed to compare outcomes of SGA vs AGA infants in the group of 500-750g: post hoc comparisons (most of the infants in the 26-29 GA group were SGA)	Funding source not report

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Author, Year	Associations found	Potential Biases	Comments
Breslau 2000 20298367	1) Information from mothers and teachers on children's behavior problems at age 11 revealed that the effect of LBW on attention problems differed between urban and suburban settings. 2) LBW children had an excess of attention problems in the urban disadvantaged communities and not in the suburban middle class communities. 3) LBW infants in the urban setting had twice as high incidence of attention problems as more than twice as high in LBW than in NBW. 4) In Urban Setting LBW children had more than 2-fold severe attention problems than NBW children 5) In suburban setting there was no difference in severe attention problems between LBW and NBW children. 6) LBW children had externalizing problems both in the urban and suburban settings (this effect was mainly accounted for by maternal smoking in pregnancy) 7) No LBW effect was observed with respect to internalizing problems 8) Regardless of LBW status, maternal smoking during pregnancy was associated with an increase in externalizing problems 9) No association was found between maternal smoking during pregnancy and internalizing or attention problems	1) Recollection bias: The Hx of maternal smoking during pregnancy was elicited when the child was 6 yrs old. This bias would have resulted in underestimation of the confounding effect of smoking during pregnancy. 2) Diagnosis bias: Although there was a correspondence of the findings of teachers' reports (who were blind to the LBW status of children) and the mothers' reports, mothers' reports could have been biased (worse scores from mothers of LBW infants)	Supported by grant from National Institute of Mental Health and National Institute of Drug Abuse

OVERALL SCORES		Attention scores	Internalizing	Externalizing
MOTHER'S SCORES				
Urban	LBW (n=217)	58.8	52.7	52.2
	NBW (n=164)	55.8	51.5	50.4
Suburban	LBW (n=194)	55.1	50.4	48.4
	NBW (n=142)	53.8	48.6	46.3
TEACHER'S SCORES				
Urban	LBW (n=186)	56.9	50.3	53.9
	NBW (n=151)	54.7	48.8	48.5
Suburban	LBW (n=180)	53.7	49.0	48.5
	NBW (n=135)	54.0	48.7	48.3

1) According to mother's ratings: For attention, externalizing and internalizing problems: LBW scored higher (had more problems) than NBW children.
2) According to teacher's rating: Only for externalizing and internalizing problems: LBW scored slightly higher than NBW.
3) Urban children received higher scores than suburban children on all 3 domains, according to both mother'' and teacher's ratings

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Author, Year	Associations found	Potential Biases	Comments
Buhrer 2000 20280896	Major Neurodevelopmental impairment 22% Independent predictors of neurodevelopmental impairment (logistic regression): CRIB score: R =0.216, ß =0.2233, SE =0.051 Maximum FIO2: R = 0.1201, ß = 1.23, SE 0.4553 Griffith's general quotient = 85 in this population: 21.6%… A CRIB score of 6 or more has a sensitivity and specificity 27.6% and 91.3% for predicting neurologic impairment.	No information as to whether evaluators were blinded	No data on funding source
Grether 2000 20448692	Receipt of MgSO4 treatment: CP (N=170) 98 (58%) Control (N=288) 178 (62%) OR: 0.84 95% CI: 0.56-1.26 Total duration (HR): (mean SD) 51 ± 78 53 ± 72 NS	Retrospective case control CP defined from chart review	No data on funding source
Katz-Salamon 2000 20332284	Infants were assessed at 10 months corrected age. Authors used Griffith's Development Scale and the Movement Assessment Index (MAI, a surrogate for evolving CP) to assess children without high-grade IVH or PVL to determine whether chronic lung disease (CLD) itself was a risk factor for adverse outcomes. CLD was associated with significantly lower performance scores on each Griffith's subscale and with significantly higher MAI scores predicting a higher risk of CP. Even in the absence of high-grade IVH or PVL, CLD has a deleterious effect on early development.	One institution; small number of infants/group Oldest evaluation <10 months of age Used a surrogate measure, the MAI for CP	Study was privately funded Incomplete result data.

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Author, Year	Associations found	Potential Biases	Comments
Marlow 2000 20150342	Pulmonary and Other predictors evaluation for **Audiology outcome**. Children with sensorineural hearing loss [15] as compared to control group[30] had longer periods of: 1) Intubation, (14 ds vs 2 ds) 2) Ventilation (34 ds vs 6 ds) 3) Oxygen therapy (57 ds vs 10 ds) 4) Acidosis (12 ds vs 0.5 ds), and 5) More treatments with dopamine (33% vs 7%)or 6) Furosemide (87% vs 53%) 7) Neither P/T of aminoglycosides 8) nor duration of jaundice 9) or level of bilirubin varied between the 2 groups. SNHL was more likely when : 1) netilmicin use coexisted with the peak of bilirubin (87% vs 14%)_ 2) when acidosis occurred when bilirubin was over 200 ?mol/l, (31% vs 4%) 3) when furosemide was used in the face of high creatinine levels (64% vs 27%) 4) when furosemide was used with netilmicin (67% vs 37%) **CNS outcome at 12 mo:** At 12 months of age evidence of cerebral palsy was present in 7/15 (47%) of children with SNHL vs 2/30 (7%) of children without SNHL.(p=0.022)	1) Very small sample size (cases with SNHL only 15) 2) Analyzed too many predictors and combination thereof, for very few outcomes. Very wide confidence intervals; and even those predictors found to be associated with the SNHL this may have been due to chance. 3) The association found between SNHL and cerebral palsy was <u>not</u> based on an adjusted analyses for possible confounders; 4) The 2 groups were different in many factors that were associated with both SNHL and CP	Did not report source of funding
Palta 2000 20096107 (CNS+Eye)	**CP** 12.6%. Independent predictors of CP and functional outcome: IVH OR 2.3 per grade (95 % CI 1.8-2.8) BPD OR 2.3 (95% CI 1.2-4.6) **Percent of the children scoring at least 2 SDs below** the normative means for the following functional outcomes: Self-care 11.7% Mobility 29.5% Social function 10.7%	(None)	Study was government funded No ophthalmology results were reported

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Author, Year	Associations found		Potential Biases	Comments
Torrioli 2000 20275419 (CNS+Eye)	*Movement ABC:* Study: 15.58±7.96 Control: 7.08±4.61 *Bell test rapidity:* Study: 19.08±7.92 Control: 22.02 ± 7.36 *Bell test rapidity:* Study: 57.34±19.67 Control: 69.08 ± 18.10 *Visual function (stereopsis %):* Study: 41.7 Control: 66.7	 P<0.001 P<0.05 P<0.05 P<0.05	Did not give the size of the control group. Baseline demographic data not presented.	Study was privately funded
Valkama 2000 20233239	51 BW < 1500g GA <34 wks: Severe CP: 5; Mod CP: 3; mild CP: 1 14 SGA: 2/14 CP (14%) 16 EVLBW<1000g: 6/16 CP (0.34) <29 wks : 12 CP Abnormal MRI 11/19 Delayed myelination 3/8		(None)	Study was privately funded
Vohr 2000 20295211	Studied effect of early IVH at 5 to 11 hours of age on IQ distribution and presence of cerebral palsy (CP). Assessed at 36 months CA. Early IVH present / Early IVH absent / P value N: 29 / 249 Binet IQ: 78.7 (25) / 87.5 (20) / 0.09 Binet IQ < 70: 38% / 19% / 0.03 PPVT-R: 76.6 (28) / 86.0 (21) / 0.15 CP at 36 months: 25% / 8% / 0.01 Later IVH had effect on Binet IQ similar to early IVH.		IVH rates seems high	No data on funding source

Evidence Table 3. Studies Evaluating Association of LBW and Cerebral Palsy and Neurological Outcomes
Part III

Author, Year	Associations found	Potential Biases	Comments
Dammann 2001 21334215	CP prevalence: BW ≤ 1500g & AGA: 16% BW ≤ 1500g & SGA: 4% P=0.005 In this skewed population, 16 % of AGA infants and 4 % of SGA infants had CP at 6 years.	(None)	Study was privately funded
Gaillard 2001 21221175	Predictors for **Neurodevelopmental outcome:** 1) Shorter length of ventilation (beyond 27(but not 50) postnatal days) was associated with better neurodevelopmental outcome : 59% (33/56) neurodevelopmentally normal or only mildly disabled survivors vs 25% (7/28) with more prolonged ventilation(> 49 ds) *Ventilated beyond 27 (but not 50)ds vs Ventilated beyond 49 ds* Total: 56 vs 28 Survived: 48/56 (86%) vs 14/28 (50% Normal neurodevelopmentally: 26/48 (54%) vs 5/14 (36%) Mild disability: 7/48 (15%) vs 2/14 (14%) Moderate disability: 11/48 (23%) vs 4/14 (29%) Severe disability: 4/48 (8%) 3/14 (21%) *2)* Number of days "off"" ventilator was not associated with the neurodevelopmental outcome at 3 yrs neither in the groups of 27-49 postnatal ds ventilation nor in the group of >49ds ventilation *Ventilated beyond 27 (but not 50)ds and O ds "off" ventilator vs 1-7 ds "off" ventilator vs > 7 ds off ventilator* Total: 18 vs 17 vs 21 Survived: 13 (72%) vs 15 (88%) vs 20 (95%) Neurodevelopmentally normal: 8 (44%) vs 7 (41%) vs 11 (52%) Mild disability: 2 (11%) vs 2 (12%) vs 3 (14%) Moderate disability: 3 (17%) vs 4 (24%) vs 4 (19%) Severe disability: 0 vs 2 (12%) vs 2 (10%) (In the second component: comparison of the retrospective cohort with the historical control) 3) Birth in a period where antenatal steroids and exogenous surfactant was more routinely used was associated with better neurodevelopmental outcome (69% vs 40% and 45% respectively in the 2 historical control cohorts)	In First component: retrospective cases control design: 1) the 2 groups were unmatched for possible confounders, thus cannot exclude false associations 2) Cannot exclude selection bias as only 62 survivors were analyzed from the 84 initially included in the 2 groups In the Second component: 3) Problems of confounders due to historical control group could be even greater Failed to report % of antenatal use in each group. Demographic data included babies that died prior to neurologic evaluation, possible source of bias. No information on comorbidities that may have led to prolonged intubation with no attempt to adjust for these	No data on funding source

Evidence Table 3. Studies Evaluating Association of LBW and Cerebral Palsy and Neurological Outcomes
Part III

Author, Year	Associations found	Potential Biases	Comments
Horwood 2001 20574647	Assessed influence of breastfeeding (BF) duration on outcome at 7-8 years age. IQ scores before adjusting for covariates. Group / n / Verbal IQ / Performance IQ Not BF / 76 / 94.4 (18.4) / 98.7 (19.6) BF < 4 mo / 99 / 97.2 (18.4) / 101.4 (15.6) BF 4-7 mo / 46 / 101.7 (17.3) / 101.1 (14.0) BF > 8 mo / 59 / 104.6 (14.7) / 104.9 (15.3) Adjustment for covariates of maternal education, two parent families, higher income families, non-smoking during pregnancy and non-Polynesian ethnicity did not change the hierarchy of results. Verbal IQ beta value = 0.12, P < 0.05 and performance IQ beta value 0.08 with P > 0.15	Retrospective collection of breast feeding data 17 children could not be tested because of sensorineural problems No information about perinatal medical condition Not clear if examiners were aware of feeding history	Study was government funded Goal of study was to assess predictive value of NBRS (neurobiologic risk score) and neonatal neurologic inventory, NNI, with respect to long-term neurodevelopment outcome of preterms between 25-34 weeks.
Nadeau 2001 21163667	EP/ VLBW, n = 61 and controls, n = 44. EP/ VLBW / Control / Significance Normal neuromotor function / 67% / 97% / NS Abnormal neuromotor function / 33% / 3% McCarthy IQ [mean (SD)] / 100.3 (19.1) / 112.8 (16.2) / P < 0.01 Behavioral ratings at 7 years age: Peers rated EP/ VLBW's as significantly more sensitive/ isolated than controls Teachers rated EP/ VLBW's as significantly more inattentive than controls Parents rated EP/ VLBW's as more hyperactive than controls Significantly = P < 0.01	(None)	No data on funding source Data on neuromotor and intellectual functioning only collected once Data on behavior collected once
Pierrat 2001 27221167	Overall, majority of premature infants with cystic PVL are not normal. Cystic-PVL (both Gr II and Gr III) is highly associated with CP. 29 of 30 infants with c-PVL + Ventriculomegaly at 40 wk PMA had CP. The following show differences in outcome based on whether the infant had cystic PVL (Grade II) or cystic PVL (Grade III): c-PVL (Gr II) / c-PVL (Gr III) No motor sequelae / 24% / 3% CP / 76% / 97% Independent walking / 22/29 / 3/26	(None)	No data on funding source