

Examining School Outcomes of Late-Preterm Infants



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Students at the University of Waterloo created this product while being trained in the systematic review methods of Knowledge Impact Strategies. Authors are listed in alphabetical order.

Knowledge  Impact
strategies

Examining School Outcomes of Late-Preterm Infants

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Take Home Message

- Gestational age itself is not a useful indicator of school outcomes
- Preterm samples often group together the outcomes of early-, moderate-, and late-term prematurity. These results do not provide distinctions based on late prematurity alone
- Subtle deficits in school outcomes are found in late-preterm infants who have multiple health problems

Overview

This project was completed during the Winter 2013 term by students in an upper-level Psychology course, *Community-Based Research*, at the University of Waterloo. The students were: Cesar Leos-Toro (Applied Health Studies), Victoria Liao (Psychology), Jared Nunn (Psychology), and Lishni Salgado (Psychology). They were assisted by the course instructor Dr. Kathleen Bloom. The community partner organization for this project was Infant and Child Development Services (ICDS) Peel. Its partnership with the University was coordinated by Lorna Montgomery, Manager at ICDS Peel. Lorna Montgomery identified topics of interest and worked with the instructor to clarify and determine the feasibility of the review prior to the start of the course. Throughout the course, she answered questions online and also offered comments and insights during a classroom presentation of the final results.

Infant and Child Development Services (ICDS) Peel is funded by the Ministry of Children and Youth Services and provides, among other services, assistance to children and the families of children born prematurely or otherwise developmentally delayed. Since premature birth is thought to be associated with difficulties at school entry, ICDS follows all premature infants and provides services to mitigate possible negative outcomes.

What Was Studied?

Research on prematurity reported in peer-reviewed journals published from 2009-2013 was reviewed using systematic methods. The goal was to determine whether differences have been reported in school outcomes between *late*-preterm infants as compared with *full*-term infants. The research question asked: "What does the recent research say about outcomes at school entry for late-preterm infants?"

The design of the systematic review considered the following factors:

Recent Research

By reviewing recent articles, this review avoids two confounding issues in the area of prematurity research: changes in both the care of preterm populations in a medical setting and the parameters used to define preterm populations in research over time. For example, both moderate- and late-preterm infants were classified as near-term infants in the past (Boyle & Boyle, 2013).

Late-Preterm Infants

Late-preterm infants account for 70 - 75% of all preterm births in Ontario (Provincial Council for Maternal and Child Health, 2012). The rate of late-preterm infant births has risen from 6.4% to 8.2% over the past 20 years (Public Health Agency of Canada, 2008). Late-term prematurity is defined as 34-36 weeks gestational age.

Multimorbidity

Many premature infants have multiple health problems, defined in the literature as “multimorbidity.” By this fact, the articles reviewed could not be restricted to premature infants with no other health complications.

School Outcomes

This review considered school outcomes from JK-Grade 12. School outcomes included: cognitive, behavioural, psychological, academic, social, and functional factors.

How Was It Studied?

The database selected for the search was Scopus, which compiles peer-reviewed articles from over 19,500 academic journals. The search used the key terms **late**, **preterm**, **school**, and **infant** and was restricted to articles published from 2009 onwards.

The search was conducted on January 17, 2013, resulting in 73 articles.

The abstracts of these articles were checked for relevance to the research question. Abstracts that met the following criteria were excluded from the review:

- Not published in English
- Not conducted with humans
- Outcomes limited to medical or physical only
- Conducted on full-term infants only

This step resulted in the exclusion of 42 articles, leaving 31 articles for inclusion in the review. The full texts of the 31 articles were then checked for relevance to the research question against the same four criteria. Six additional articles were excluded on the grounds that they were

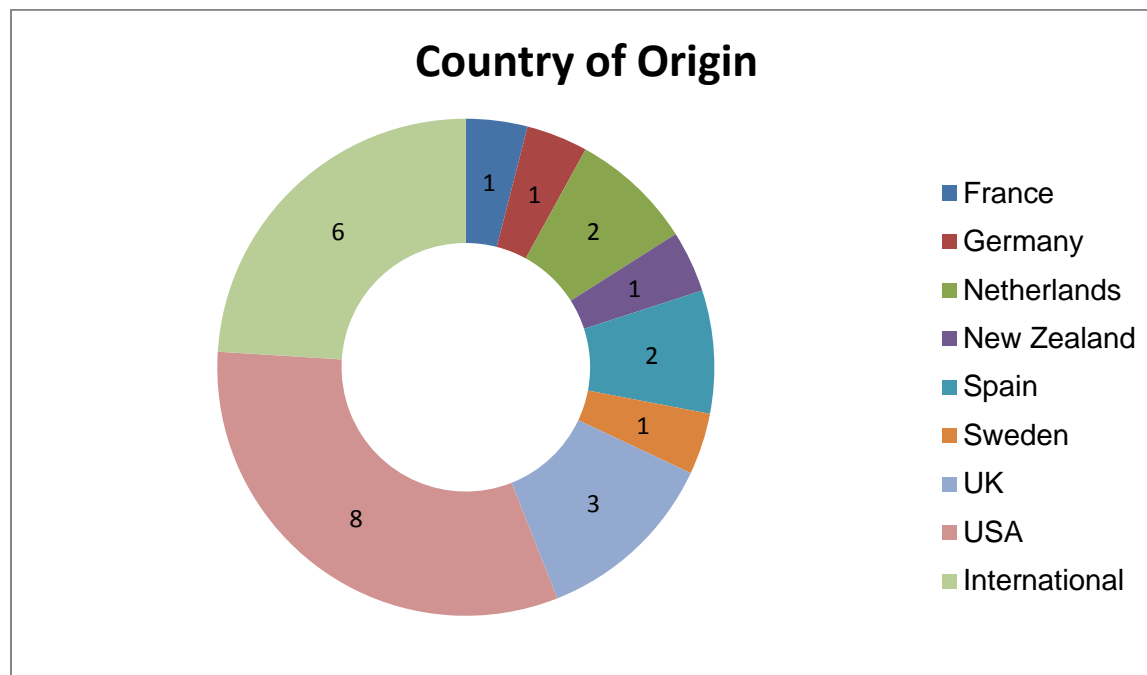
limited to physical outcomes only, and 25 articles remained. All remaining articles were included in our review.

Reliability of the coding between team members was checked at the stage of article inclusion (described above) and article coding. Team members recoded each other's articles without knowledge of the other member's work and compared their coding for discrepancies. All discrepancies were resolved by written discussion in an online forum between team members in accordance with advice from Dr. Bloom.

Highlights of Results

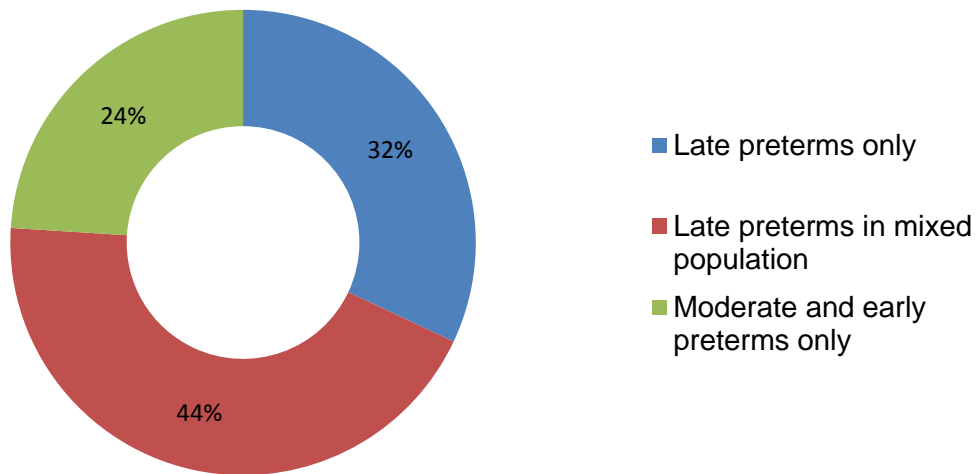
- All 25 articles came from developed countries
- Academic and cognitive outcomes were assessed in 19 articles
- Only 8 articles (32%) studied late-preterm infants exclusively
- Subtle deficits in school outcomes were found in late-preterm samples with multimorbidities
- In contrast, healthy late-preterm infants did not show deficits in school outcomes
- Gestational age itself is not a reliable predictor of school outcomes
- The research methods used in the current literature varied widely

Landscapes of Articles

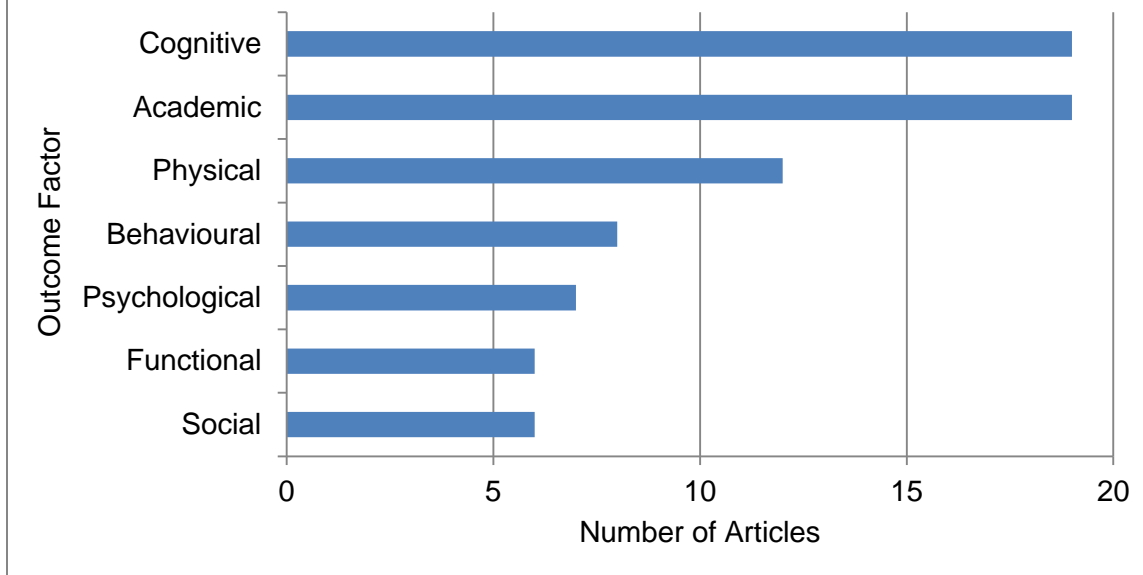


* Canadian research was included in some international studies

Study Samples



Articles per Outcome Factor



* Some articles reported more than one outcome

Survey of Articles

Two main questions were asked of each of the 25 articles:

- What was studied?
- What was found?

Information on the following factors was extracted from each of the articles:

- Population
 - Country of origin
 - Age at birth (Public Health Agency of Canada, 2008):
 - Early preterm: < 32 weeks
 - Moderate preterm: 32 - 33 weeks
 - Late preterm: 34 - 36 weeks
 - Full term: 37 - 41 weeks
 - Birth weight:
 - <1500g
 - ≥1500g
 - Complications:
 - Mild brain injury
 - Severe brain injury
 - Chronic lung disease
 - Multimorbidity:
 - Specific complication(s)
 - Age at outcome assessment
- Methods
 - Descriptive
 - Comparison
 - Intervention
 - Review
- Outcomes
 - Physical
 - Cognitive
 - Behavioural
 - Psychological
 - Academic
 - Social
 - Functional

*Blank cells indicate that information was not reported in the article

Citation	Country	Preterm			Full Term	Birth Weight		Complications			Multimorbidity
		Early	Moderate	Late		<1500g	≥1500g	Mild brain injury	Severe brain injury	Chronic lung disease	
Álvarez Mingorance, P., Burón Martínez, E., & Blanco Quirós, A. (2011). Morbidity in premature children in school age (II): Respiratory morbidity, alterations in the growth pattern and blood pressure. [Morbilidad de los niños prematuros en edad escolar (II): Patología respiratoria, alteraciones del crecimiento y presión arterial] <i>Acta Pediátrica Espanola</i> , 69(9), 379-384.	Spain	X	X	X	X						Bronchopulmonary dysplasia (BPD), cardiovascular anomalies
Álvarez Mingorance, P., Burón Martínez, E., Izquierdo Herrero, E., Maniega Rubio, M. A., & Blanco Quirós, A. (2011). Morbidity in premature children in school age (I): Neurosensorial deficits, psycho-intellectual and behavior problems. [Morbilidad de los niños prematuros en edad escolar (I): Alteraciones neurosensoriales, psicointelectivas y de conducta] <i>Acta Pediátrica Espanola</i> , 69(7-8), 317-324.	Spain	X	X	X	X						Cerebral paralysis, blindness
Barde, L. H. F., Yeatman, J. D., Lee, E. S., Glover, G., & Feldman, H. M. (2012). Differences in neural activation between preterm and full term born adolescents on a sentence comprehension task: Implications for educational accommodations. <i>Developmental Cognitive Neuroscience</i> , 2(SUPPL. 1), S114-S128.	USA	X	X	X	X						
Baron, I. S., Ahronovich, M. D., Erickson, K., Gidley Larson, J. C., & Litman, F. R. (2009). Age-appropriate early school age neurobehavioral outcomes of extremely preterm birth without severe intraventricular hemorrhage: A single center experience. <i>Early Human Development</i> , 85(3), 191-196.	USA	X	X	X	X	X		X			Intraventricular Hemorrhage
Baron, I. S., Erickson, K., Ahronovich, M. D., Baker, R., & Litman, F. R. (2011). Cognitive deficit in preschoolers born late-preterm. <i>Early Human Development</i> , 87(2), 115-119.	USA			X	X		X				

Citation	Method				Age at Assessment	Outcomes							What Was Found
	Descriptive	Comparison	Intervention	Review		Physical	Cognitive	Behavioural	Psychological	Academic	Social	Functional	
Alvarez Mingorance, P., Burón Martínez, E., & Blanco Quirós, A. (2011). Morbidity in premature children in school age (II): Respiratory morbidity, alterations in the growth pattern and blood pressure. [Morbilidad de los niños prematuros en edad escolar (II): Patología respiratoria, alteraciones del crecimiento y presión arterial] <i>Acta Pediátrica Espanola</i> , 69(9), 379-384.		X			5-10 yrs	X							<ul style="list-style-type: none"> • Premature infants have been observed to display more respiratory and cardiovascular pathologies than full term infants • Late-preterm infants do not display different outcomes from full term infants at school age
Alvarez Mingorance, P., Burón Martínez, E., Izquierdo Herrero, E., Maniega Rubio, M. A., & Blanco Quirós, A. (2011). Morbidity in premature children in school age (I): Neurosensorial deficits, psycho-intellectual and behavior problems. [Morbilidad de los niños prematuros en edad escolar (I): Alteraciones neurosensoriales, psicointelectivas y de conducta] <i>Acta Pediátrica Espanola</i> , 69(7-8), 317-324.		X			5-10 yrs		X	X	X	X	X	X	<ul style="list-style-type: none"> • Half of preterm infants more likely to have difficulties at school age in outcomes under observation
Barde, L. H. F., Yeatman, J. D., Lee, E. S., Glover, G., & Feldman, H. M. (2012). Differences in neural activation between preterm and full term born adolescents on a sentence comprehension task: Implications for educational accommodations. <i>Developmental Cognitive Neuroscience</i> , 2(SUPPL. 1), S114-S128.	X	X			9-16 yrs	X		X				X	<ul style="list-style-type: none"> • Educational implications of unique linguistic and cognitive processing styles of preterm school age children • No main effects of group interactions
Baron, I. S., Ahronovich, M. D., Erickson, K., Gidley Larson, J. C., & Litman, F. R. (2009). Age-appropriate early school age neurobehavioral outcomes of extremely preterm birth without severe intraventricular hemorrhage: A single center experience. <i>Early Human Development</i> , 85(3), 191-196.		X			7 yrs		X	X	X	X	X	X	<ul style="list-style-type: none"> • Participants only differed in auditory phoneme analysis, with those <26wks doing worse • The rest performed at comparable levels in other domains
Baron, I. S., Erickson, K., Ahronovich, M. D., Baker, R., & Litman, F. R. (2011). Cognitive deficit in preschoolers born late-preterm. <i>Early Human Development</i> , 87(2), 115-119.	X	X			4 yrs		X						<ul style="list-style-type: none"> • Neonatal morbidities contribute to <i>subtle</i> cognitive deficits, male gender additional risk factor • LPT insufficient predictor of long-term neurocognitive outcomes; educational implications present for policy/education etc.

Citation	Country	Preterm			Full Term	Birth Weight		Complications			Multimorbidity
		Early	Moderate	Late		<1500g	≥1500g	Mild brain injury	Severe brain injury	Chronic lung disease	
Baron, I. S., Erickson, K., Ahronovich, M. D., Coulehan, K., Baker, R., & Litman, F. R. (2009). Visuospatial and verbal fluency relative deficits in 'complicated' late-preterm preschool children. <i>Early Human Development</i> , 85(12), 751-754.	USA			X	X		X				Complicated Preterm (cLPT)
de Jong, M., Verhoeven, M., & van Baar, A. L. (2012). School outcome, cognitive functioning, and behaviour problems in moderate and late preterm children and adults: A review. <i>Seminars in Fetal and Neonatal Medicine</i> , 17(3), 163-169.	International		X	X	X						
Dong, Y., & Yu, J. -. (2011). An overview of morbidity, mortality and long-term outcome of late preterm birth. <i>World Journal of Pediatrics</i> , 7(3), 199-204.	International			X	X						Respiratory Distress Syndrome, Persistent Pulmonary Hypertension of newborns, hyperbilirubinemia, Intraventricular Hemorrhage, Culture-proven Sepsis, temperature stability, hypoglycemia, dehydration and feeding difficulties
Doyle, L. W., & Saigal, S. (2009). Long-term outcomes of very preterm or tiny infants. <i>Neoreviews</i> , 10(3), e130-e137.	International	X			X						Cerebral palsy, vision impairment, hearing impairment, epilepsy, respiratory illness, developmental coordination disorder
Engle, W. A. (2009). Infants born late preterm: Definition, physiologic and metabolic immaturity, and outcomes. <i>Neoreviews</i> , 10(6), e280-e286.	International			X	X						Hypothermia, respiratory distress, apnea, hypoglycemia, hyperbilirubinemia, jaundice, feeding problems
Gurka, M. J., Locasale-Crouch, J., & Blackman, J. A. (2010). Long-term cognition, achievement, socioemotional, and behavioral development of healthy late-preterm infants. <i>Archives of Pediatrics and Adolescent Medicine</i> , 164(6), 525-532.	USA			X	X						

Citation	Method				Age at Assessment	Outcomes							What Was Found
	Descriptive	Comparison	Intervention	Review		Physical	Cognitive	Behavioural	Psychological	Academic	Social	Functional	
Baron, I. S., Erickson, K., Ahronovich, M. D., Coulehan, K., Baker, R., & Litman, F. R. (2009). Visuospatial and verbal fluency relative deficits in 'complicated' late-preterm preschool children. <i>Early Human Development</i> , 85(12), 751-754.	X	X			3 yrs	X	X			X		X	<ul style="list-style-type: none"> • Delay/deficit in visuospatial and verbal fluency recommended routinely at age of school entry
de Jong, M., Verhoeven, M., & van Baar, A. L. (2012). School outcome, cognitive functioning, and behaviour problems in moderate and late preterm children and adults: A review. <i>Seminars in Fetal and Neonatal Medicine</i> , 17(3), 163-169.				X	Various		X	X	X	X			<ul style="list-style-type: none"> • Moderate/late preterms show more school problems, have lower IQ scores (especially high risk), more behaviour problems than their full term counterparts • ADHD is more frequent
Dong, Y., & Yu, J. -. (2011). An overview of morbidity, mortality and long-term outcome of late preterm birth. <i>World Journal of Pediatrics</i> , 7(3), 199-204.				X	Various	X	X			X			<ul style="list-style-type: none"> • Late preterms have higher risk of morbidity, mortality, growth problems, school performance, and neurodevelopmental problems than full-term infants • Confounders included lack of controls, ambiguous assessment tools and poor methodological factors
Doyle, L. W., & Saigal, S. (2009). Long-term outcomes of very preterm or tiny infants. <i>Neoreviews</i> , 10(3), e130-e137.				X	Various	X	X	X	X	X	X	X	<ul style="list-style-type: none"> • Neurodevelopmental morbidity, school difficulties, intellectual disability, behavioral or psychological problems, vision or hearing problems, higher systolic blood pressure, more restrictions in daily living and self-care abilities
Engle, W. A. (2009). Infants born late preterm: Definition, physiologic and metabolic immaturity, and outcomes. <i>Neoreviews</i> , 10(6), e280-e286.				X	Various	X		X	X	X	X		<ul style="list-style-type: none"> • Late preterms have higher risk for long-term complications including developmental delays, school failure, behavior disorders, and social disabilities
Gurka, M. J., Locasale-Crouch, J., & Blackman, J. A. (2010). Long-term cognition, achievement, socioemotional, and behavioral development of healthy late-preterm infants. <i>Archives of Pediatrics and Adolescent Medicine</i> , 164(6), 525-532.	X				4-15 yrs		X	X	X	X	X	X	<ul style="list-style-type: none"> • Late preterms born healthy are not significantly different from full-term children

Citation	Country	Preterm			Full Term	Birth Weight		Complications			Multimorbidity
		Early	Moderate	Late		<1500g	≥1500g	Mild brain injury	Severe brain injury	Chronic lung disease	
Hallin, A. -, Hellström-Westas, L., & Stjernqvist, K. (2010). Follow-up of adolescents born extremely preterm: Cognitive function and health at 18 years of age. <i>Acta Paediatrica, International Journal of Paediatrics</i> , 99(9), 1401-1406.	Sweden	X			X						Hearing impairments
Lipkind, H. S., Slopen, M. E., Pfeiffer, M. R., & McVeigh, K. H. (2012). School-age outcomes of late preterm infants in new york city. <i>American Journal of Obstetrics and Gynecology</i> , 206(3), 222.e1-222.e6.	USA		X	X	X	X					
McGowan, J. E., Alderdice, F. A., Holmes, V. A., & Johnston, L. (2011). Early childhood development of late-preterm infants: A systematic review. <i>Pediatrics</i> , 127(6), 1111-1124.	International			X							
Morse, S. B., Zheng, H., Tang, Y., & Roth, J. (2009). Early school-age outcomes of late preterm infants. <i>Pediatrics</i> , 123(4), e622-e629.	USA			X	X						
Odd, D. E., Emond, A., & Whitelaw, A. (2012). Long-term cognitive outcomes of infants born moderately and late preterm. <i>Developmental Medicine and Child Neurology</i> , 54(8), 704-709.	UK		X	X	X		X				
Patrianakos-Hoobler, A. I., Msall, M. E., Huo, D., Marks, J. D., Plesha-Troyke, S., & Schreiber, M. D. (2010). Predicting school readiness from neurodevelopmental assessments at age 2 years after respiratory distress syndrome in infants born preterm. <i>Developmental Medicine and Child Neurology</i> , 52(4), 379-385.	USA	X	X	X		X				X	Respiratory distress syndrome
Peacock, P. J., Henderson, J., Odd, D., & Emond, A. (2012). Early school attainment in late-preterm infants. <i>Archives of Disease in Childhood</i> , 97(2), 118-120.	UK		X	X	X						
Quigley, M. A., Poulsen, G., Boyle, E., Wolke, D., Field, D., Alfirevic, Z., & Kurinczuk, J. J. (2012). Early term and late preterm birth are associated with poorer school performance at age 5 years: A cohort study. <i>Archives of Disease in Childhood: Fetal and Neonatal Edition</i> , 97(3), F167-F173.	UK	X	X	X	X						

Citation	Method				Age at Assessment	Outcomes							What Was Found
	Descriptive	Comparison	Intervention	Review		Physical	Cognitive	Behavioural	Psychological	Academic	Social	Functional	
Hallin, A. -, Hellström-Westas, L., & Stjernqvist, K. (2010). Follow-up of adolescents born extremely preterm: Cognitive function and health at 18 years of age. <i>Acta Paediatrica, International Journal of Paediatrics</i> , 99(9), 1401-1406.		X			10 , 18 yrs		X			X			• Early preterms had significantly lower IQ; showed slower visuomotor speed; had lower grades from compulsory school
Lipkind, H. S., Slopen, M. E., Pfeiffer, M. R., & McVeigh, K. H. (2012). School-age outcomes of late preterm infants in new york city. <i>American Journal of Obstetrics and Gynecology</i> , 206(3), 222.e1-222.e6.		X			8-9 yrs		X			X		X	• Moderate and late preterms higher adjusted odds of needing special education, lower adjusted math and English scores
McGowan, J. E., Alderdice, F. A., Holmes, V. A., & Johnston, L. (2011). Early childhood development of late-preterm infants: A systematic review. <i>Pediatrics</i> , 127(6), 1111-1124.				X	Various	X	X	X		X			• Systematic review of the early childhood outcomes of late-preterm infants, measuring neurodevelopmental disabilities, educational ability, early-intervention requirements, medical disabilities, and physical growth • Recommends further investigation as subject has not been fully explored
Morse, S. B., Zheng, H., Tang, Y., & Roth, J. (2009). Early school-age outcomes of late preterm infants. <i>Pediatrics</i> , 123(4), e622-e629.	X				5 yrs		X			X			• Observed the early school-age outcomes between late-preterm and full-term infants, measuring risk for suspension, increased risk for developmental delay
Odd, D. E., Emond, A., & Whitelaw, A. (2012). Long-term cognitive outcomes of infants born moderately and late preterm. <i>Developmental Medicine and Child Neurology</i> , 54(8), 704-709.	X				8-11 yrs		X			X			• Complicated late preterms have poorer outcomes than term infants
Patrianakos-Hoobler, A. I., Msall, M. E., Huo, D., Marks, J. D., Plesha-Troyke, S., & Schreiber, M. D. (2010). Predicting school readiness from neurodevelopmental assessments at age 2 years after respiratory distress syndrome in infants born preterm. <i>Developmental Medicine and Child Neurology</i> , 52(4), 379-385.					5-7 yrs	X	X			X			• Preterm infants experiencing respiratory distress were randomly sorted into two treatments: Nitric Oxide surfactant and ventilation or a placebo • Infants were studied over time and compared on birth weight, gestational age, school readiness, neurosensory outcomes like blindness, and neurodevelopmental classifications like disabled or delayed
Peacock, P. J., Henderson, J., Odd, D., & Emond, A. (2012). Early school attainment in late-preterm infants. <i>Archives of Disease in Childhood</i> , 97(2), 118-120.	X				7 yrs					X			• Differences found due to differences in defining preterms • Study includes moderate preterms which explains the discrepancies in reading, writing and math scores
Quigley, M. A., Poulsen, G., Boyle, E., Wolke, D., Field, D., Alfirevic, Z., & Kurinczuk, J. J. (2012). Early term and late preterm birth are associated with poorer school performance at age 5 years: A cohort study. <i>Archives of Disease in Childhood: Fetal and Neonatal Edition</i> , 97(3), F167-F173.	X				5 yrs					X	X		• Percentage of children not reaching a good level of overall achievement at the end of their first school year increases as prematurity increases

Citation	Country	Preterm			Full Term	Birth Weight		Complications			Multimorbidity
		Early	Moderate	Late		<1500g	≥1500g	Mild brain injury	Severe brain injury	Chronic lung disease	
Reuner, G., Hassenpflug, A., Pietz, J., & Philippi, H. (2009). Long-term development of low-risk low birth weight preterm born infants: Neurodevelopmental aspects from childhood to late adolescence. <i>Early Human Development</i> , 85(7), 409-413.	Germany	X	X	X	X	X	X				
Santos, A., Duret, M., Mancini, J., Gire, C., & Deruelle, C. (2009). Preterm birth affects dorsal-stream functioning even after age 6. <i>Brain and Cognition</i> , 69(3), 490-494.	France	X			X	X	X				
Stephens, B. E., & Vohr, B. R. (2009). Neurodevelopmental outcome of the premature infant. <i>Pediatric Clinics of North America</i> , 56(3), 631-646.	International			X	X						Cerebral palsy, neurodevelopmental sequelae
ter Wolbeek, M., de Sonnevile, L. M. J., de Vries, W. B., Kavelaars, A., Veen, S., Kornelisse, R. F., . . . Heijnen, C. J. (2012). Early life intervention with glucocorticoids has negative effects on motor development and neuropsychological function in 14-17 year-old adolescents. <i>Psychoneuroendocrinology</i>	Netherlands	X								X	Bronchopulmonary dysplasia (BPD)
van der Ree, M., Tanis, J. C., Van Braeckel, K. N. J. A., Bos, A. F., & Roze, E. (2011). Functional impairments at school age of preterm born children with late-onset sepsis. <i>Early Human Development</i> , 87(12), 821-826.	Netherlands	X			X	X					Late-onset sepsis
Woodward, L. J., Clark, C. A. C., Bora, S., & Inder, T. E. (2012). Neonatal white matter abnormalities an important predictor of neurocognitive outcome for very preterm children. <i>PLoS ONE</i> , 7(12)	New Zealand	X			X						

Citation	Method				Age at Assessment	Outcomes							What Was Found
	Descriptive	Comparison	Intervention	Review		Physical	Cognitive	Behavioural	Psychological	Academic	Social	Functional	
Reuner, G., Hassenpflug, A., Pietz, J., & Philippi, H. (2009). Long-term development of low-risk low birth weight preterm born infants: Neurodevelopmental aspects from childhood to late adolescence. <i>Early Human Development</i> , 85(7), 409-413.		X			17 yrs	X			X	X			<ul style="list-style-type: none"> • Height of low birth weight (LBW) preterms was below that of controls • School enrollment was delayed more often, along with lower rates of graduation • LBW preterms received more therapeutical interventions
Santos, A., Duret, M., Mancini, J., Gire, C., & Deruelle, C. (2009). Preterm birth affects dorsal-stream functioning even after age 6. <i>Brain and Cognition</i> , 69(3), 490-494.		X			6-9 yrs		X						<ul style="list-style-type: none"> • Preterms had dorsal-stream impairments, as assessed by a visuo-constructive task
Stephens, B. E., & Vohr, B. R. (2009). Neurodevelopmental outcome of the premature infant. <i>Pediatric Clinics of North America</i> , 56(3), 631-646.	X				Various	X	X			X			<ul style="list-style-type: none"> • Preterms have higher rates of neonatal morbidities (which have potential long-term neurodevelopmental sequelae) • Increased risk for cerebral palsy • Lower reading and math scores in kindergarten and first grade • More likely to qualify for special education services
ter Wolbeek, M., de Sonnevile, L. M. J., de Vries, W. B., Kavelaars, A., Veen, S., Kornelisse, R. F., . . . Heijnen, C. J. (2012). Early life intervention with glucocorticoids has negative effects on motor development and neuropsychological function in 14-17 year-old adolescents. <i>Psychoneuroendocrinology</i>			Glucocorticoids (DEX), Hydrocortisone (HC)		14-17 yrs	X	X			X			<ul style="list-style-type: none"> • Preterms studied have co-morbid bronchopulmonary dysplasia (BPD) and their outcome is studied on the basis of treatment they received • Compared two treatments (DEX vs. HC) for pretermatures with lung problems and the developmental outcomes as a result of the treatments (and not of prematurity itself) • DEX-treated participants performed more poorly on tasks measuring gross motor skill, alertness, visuomotor coordination, and emotion recognition • Higher proportion of DEX-treated girls required special education compared to the other groups
van der Ree, M., Tanis, J. C., Van Braeckel, K. N. J. A., Bos, A. F., & Roze, E. (2011). Functional impairments at school age of preterm born children with late-onset sepsis. <i>Early Human Development</i> , 87(12), 821-826.		X			6-9 yrs	X	X						<ul style="list-style-type: none"> • Preterms studied have co-morbid late-onset sepsis • Motor problems, considerably lower IQ, and impaired memory and attention
Woodward, L. J., Clark, C. A. C., Bora, S., & Inder, T. E. (2012). Neonatal white matter abnormalities an important predictor of neurocognitive outcome for very preterm children. <i>PLoS ONE</i> , 7(12)		X			4, 6 yrs		X						<ul style="list-style-type: none"> • Preterms without cerebral white matter abnormalities showed no apparent neurocognitive impairments on any of the domain specific measures of intelligence, language, and executive functioning • Preterms with mild and moderate-to-severe cerebral white matter abnormalities had performance impairments across all measures, with more severe cerebral abnormalities being associated with increased impairments

Acknowledgements

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