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Number 70

Criteria for Determining Disability in Infants and Children: Low Birth Weight

Volume 1. Evidence Report and Appendixes

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Preface

The Agency for Healthcare Research and Quality (AHRQ), through its Evidence-Based Practice Centers (EPCs), sponsors the development of evidence reports and technology assessments to assist public- and private-sector organizations in their efforts to improve the quality of health care in the United States. The reports and assessments provide organizations with comprehensive, science-based information on common, costly medical conditions and new health care technologies. The EPCs systematically review the relevant scientific literature on topics assigned to them by AHRQ and conduct additional analyses when appropriate prior to developing their reports and assessments.

To bring the broadest range of experts into the development of evidence reports and health technology assessments, AHRQ encourages the EPCs to form partnerships and enter into collaborations with other medical and research organizations. The EPCs work with these partner organizations to ensure that the evidence reports and technology assessments they produce will become building blocks for health care quality improvement projects throughout the Nation. The reports undergo peer review prior to their release.

AHRQ expects that the EPC evidence reports and technology assessments will inform individual health plans, providers, and purchasers as well as the health care system as a whole by providing important information to help improve health care quality.

We welcome written comments on this evidence report. They may be sent to: Director, Center for Practice and Technology Assessment, Agency for Healthcare Research and Quality, 6010 Executive Blvd., Suite 300, Rockville, MD 20852.

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The authors of this report are responsible for its content. Statements in the report should not be construed as endorsement by the Agency for Healthcare Research and Quality or the U.S. Department of Health and Human Services of a particular drug, device, test, treatment, or other clinical service.

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Structured Abstract

Objective. The Social Security Administration (SSA) of the Department of Health and Human Services requested that the Agency for Healthcare Research and Quality (AHRQ), through its Evidence-based Practice Center (EPC) program, produce an evidence report to determine whether specific factors or combination of factors alone or in addition to birth weight predict significant developmental disability in former premature infants and whether premature infants with such factors have long-term developmental disabilities.

Search Strategy. Studies with original data used in this evidence report were identified through MEDLINE® searches of the English language literature published between 1966 and January 2002. Additional studies were identified from supplemental searches in ERIC, PsycInfo, HealthStar and Embase and from reference lists, review and primary articles, and from domain experts.

Selection Criteria. We reviewed retrospective and prospective studies reporting impairments in infants or children who weighed 2,000 grams or less, whose gestational age was 35 week or less, or whose birth weight or gestational age were below these thresholds. Preferences were given to recent studies and studies with a minimum of 6 months of follow-up.

Data Collection and Analysis. We incorporated 178 English language articles in the evidence report. Relevant data from each article were abstracted into evidence tables. Information from the evidence tables was synthesized into summary tables describing the findings of each study. Studies were graded according to the methodological quality and applicability.

Main Results. We looked for evidence of association of very low birth weight (VLBW defined as <1500 grams) with six outcome conditions. The evidence of the literature overwhelmingly supports that the risk of cerebral palsy (CP) and major neurologic disability is increased among VLBW infants compared to full-term infants. The literature is consistent in demonstrating that risk of CP, major neurosensory and/or neurologic disability is inversely proportional to the degree of immaturity whether measured by gestational age or by birth weight.
The evidence demonstrates that children who were born VLBW have significantly higher rates of cognitive abnormality in early childhood and a several-fold increased prevalence of IQ <70 as adults compared with children or adults who were born normal birth weight at term. There is evidence that even children who were apparently "well" VLBW infants during their neonatal course are also at significantly greater risk for both moderate and severe delay compared to larger birth weight groups.

VLBW infants are at high risk for developing cognitive, neuromotor, and neurosensory disabilities including blindness and hearing loss. These disabilities in turn may lead to other disabilities in speech and language, behavior problems and learning disabilities affecting school performance. All of the above problems have been identified in disproportionate numbers in the VLBW infants.

The studies provided strong evidence of increased incidence of speech and language delays in VLBW and extremely premature infants, and identified clinical factors associated with the increased incidence. Across all measures of short-term memory and language outcomes,

preschool children who were born preterm performed at a lower level than children who were full-term counterparts. These deficits were independent of the general IQ.

The evidence identified by this review clearly demonstrates that children born as VLBW infants, with or without retinopathy of prematurity (ROP), are at significantly increased risk of visual impairments and disability compared to children born full term. The risk of visual disability in VLBW infants varies inversely with gestational age.

The studies reviewed indicate that VLBW infants with bronchopulmonary dysplasia (BPD) are at increased risk for long-term pulmonary disability. The greater the severity of BPD, the greater is the association with long-term pulmonary impairment and need for re-hospitalization.

VLBW infants, with or without other conditions, are at high risk for poor growth during the first years of life due to acute neonatal illnesses, developmental delays, and chronic illnesses.

Conclusions. Surviving premature infants often sustain multi-organ system complications that may persist beyond the first few years of life and frequently result in permanent impairments. Complications of even a single organ system may have a profound impact upon other organ systems. Biomedical determinants of disability in premature infants are often compounded by adverse determinants of social and psychological adaptation of these vulnerable children and their families.

Contents

Summary 1

Evidence Report

Chapter 1. Introduction 15
Definition of Disability 15
Definition of Prematurity 15
The Problem of Prematurity 16
Factors Associated with Disability in VLBW Infants 17

Chapter 2. Methods 21
Key Questions Addressed by the Evidence Report 21
Literature Search Strategies 22
Search Results 22
Limitations of the Literature Search 23
Study Selection 23
Results from Abstract Screening 23
Revised Study Selection Criteria 24
Outcomes and Predictors Considered in this Evidence Report 24
Data Abstraction Process 26
Reporting the Evidence 27
Evidence Tables 27
Summarizing the Evidence of Individual Studies 28
Methodological Quality 28
Applicability 29
Results 30

Chapter 3. Results 31
Evidence that VLBW With or Without Other Conditions is Associated With Cerebral Palsy (CP) and Neurologic Disability 31
Definition of CP, Neurologic Vulnerability of Immature Brain, and Detection Of Brain Injury 32
Evidence that VLBW Infants have Increased Risk of CP and Neurologic Disability 32
Evidence that VLBW Plus Other Factors are Associated with CP and Neurologic Abnormalities 42
Evidence that VLBW With or Without Other Conditions is Associated with Abnormal Cognitive Development and MR 54
Definitions and Assessment of Cognitive Development 55
Evidence that VLBW Infants are at Increased Risk of MR and Estimates of Prevalence 56
Evidence that Specific Risk Factors are Independently Associated with MR in VLBW Infants 60

Evidence that VLBW is Associated with Disabilities of Speech/language Delay, Hearing Loss, Behavioral Disorders, and Learning Disabilities..... 77
Speech, Language, and Communication Disorder Outcomes..... 78
Audiology Outcomes..... 83
Behavioral/Social Outcomes..... 89
Learning Disability/School Performance Outcomes..... 93
Evidence that VLBW With or Without Other Conditions is Associated with Visual Disability..... 96
Evidence that VLBW Infants have Increased Visual Disability..... 97
Evidence that VLBW Infants with Retinopathy of Prematurity (ROP) have Visual Disability..... 102
Evidence that VLBW Infants with CNS Abnormality have Visual Disability (with No or Mild ROP) 109
Evidence that VLBW and/or ROP and/or CNS Injury are Positively Associated With Refractive Error (Myopia) and Ocular Motility (Strabismus)..... 111
Evidence that VLBW Plus Bronchopulmonary Dysplasia (BPD) and Systemic Glucocorticosteroid Therapy for Bronchopulmonary Dysplasia are Associated with Visual Disability..... 114
Evidence that VLBW Infants have Increased Incidence of Ophthalmic Interventions Due to Visual Disability..... 115
Evidence that VLBW With or Without Other Conditions is Associated with Pulmonary Disability..... 116
Bronchopulmonary Dysplasia (BPD): Definition, Background, and Significance…… 116
Pulmonary Outcome Measures..... 117
Evidence that VLBW with BPD is Associated with Long-term Pulmonary Morbidity and Disability by Duration of Follow-up..... 118
Pulmonary Function Testing and Exercise Tolerance..... 124
Evidence that VLBW is Associated with Asthma or Hyper-reactive Airway Disease..... 125
Evidence that VLBW Infants have Increased Rehospitalization for Respiratory Illness..... 126
Evidence that VLBW with or without Other Conditions is Associated with Growth Impairment..... 128
Evidence that VLBW is Associated with Growth Impairment..... 129
Evidence that VLBW plus BPD is Associated with Growth Impairment..... 132
Evidence that VLBW plus Antenatal Glucocorticoid Exposure is Associated with Growth Impairment..... 133
Evidence that VLBW Plus Necrotizing Enterocolitis is Associated with Growth Impairment..... 133
Evidence Linking VLBW Plus Postnatal Nutrition with Growth Impairment..... 134

Chapter 4. Conclusions..... 137

Overall..... 137
Neurodevelopmental Disabilities..... 137
Speech and Language..... 139
Visual Disability..... 139
Pulmonary Disability..... 140
Poor Growth..... 141

Chapter 5. Future Research..... 143
Evaluation of the Application Process of SSA VLBW Disability Criteria..... 143
Determine the Appropriateness of the New VLBW Disability Criteria Proposed by SSA Based on the Evidence of this Report..... 143
Proposal to Improve the Evidence of Predictors and Predictive Models..... 144
Improve Definitions of Predictors..... 144
Identify New Predictors..... 144
Feasibility of Future Research Proposals..... 145

References/Bibliography..... 147

Appendixes
Appendix A. Search Strategies..... 161
Appendix B. Data Abstraction Form..... 169
Appendix C. Acronyms and Abbreviations..... 179
Appendix D. Acknowledgements..... 181

Tables

Table A. Live birth distribution organized by birth weight and gestation in the United States in the year 2000..... 16
Table B. Mortality and Morbidity of Premature Infants by Birth Weight Born in NICHD Neonatal Research Network Between January 1, 1993 and December 31, 1994 17
Table C. Inclusion/exclusion Criteria..... 24
Table D. List of Predictors and Outcomes..... 25
Table E. Evidence Tables Created in this Report..... 27
Table 1.1a Association of Cerebral Palsy with VLBW/Prematurity (Prevalence of CP in observational studies) 32
Table 1.1b Association of Cerebral Palsy with LBW/Prematurity (Prevalence of CP in Clinical Trials) 38
Table 1.2a Association of Cerebral Palsy with LBW/Prematurity..... 40
Table 1.3a Association of CP and Neurologic Abnormalities to VLBW plus CNS Injury 42
Table 1.3b Association of CP and Neurologic Abnormalities with Antenatal Factors in VLBW Infants..... 47
Table 1.3c Association of CP and Neurologic Abnormalities to VLBW plus BPD and Postnatal Systemic Glucocorticoid Therapy..... 51

Table 1.3d Association of CP and Neurologic Abnormalities to Parenting/Psychological Factors in VLBW Infants..... 53
Table 1.3e Association of CP and Neurologic Abnormalities to VLBW Plus Other Factors (Gender Size of GA)……. 53
Table 2.1 Representative Ability Test Scores Defining Significantly Delayed or Deficient Cognitive Development/Mental Retardation..... 55
Table 2.2 Incidence of Mental Retardation in VLBW/ELBW Infants..... 56
Table 2.3 Changes in Incidence of MR with Time..... 59
Table 2.4 Association of Mental Retardation/Disability to Independent Risk Factors in LBW Infants..... 60
Table 2.5 Association of Mental Retardation/Disability with Other Risk Factors in LBW Infants..... 76
Table 3.1 Association of LBW to Speech and Language Disorders..... 79
Table 3.2 Association of VLBW with Hearing Loss..... 84
Table 3.3 Association of LBW to Behavior Outcomes..... 89
Table 3.4 Association of LBW to Learning Disability and School Performance..... 94
Table 4.1 Association of VLBW/Prematurity with Ophthalmology Outcomes..... 97
Table 4.2a Visual Disability Related to Increasing Severity of ROP in VLBW Infants..... 103
Table 4.2b Proportion (%) of Eyes with Unfavorable Visual Function..... 104
Table 4.3 Unfavorable Functional Outcome (%) in Eyes with Threshold ROP by Randomized Treatment Assignment (Cryotherapy vs. No Cryotherapy) during 1, 3.5, 5.5 and 10-year Follow-up..... 105
Table 4.4 Visual Disability Related to Severe (Threshold) ROP..... 107
Table 4.5 Evidence that VLBW Infants with CNS Abnormality Have Visual Disability (with no or mild ROP) 109
Table 4.6 VLBW and/or ROP and/or CNS Injury are Positively Associated with Refractive Error (Myopia) and Ocular Motility (Strabismus) 111
Table 4.7 Abnormal Visual Function Due to Fixation Instability (Nystagmus and Strabismus) in VLBW Infants..... 113
Table 4.8 Association Between VLBW Plus Bronchopulmonary Dysplasia (BPD) and Systemic Glucocorticosteroid Therapy for Bronchopulmonary Dysplasia with Visual Disability..... 115
Table 5.1 Percent of Infants with BPD in Relation to Birth Weight in the Vermont Oxford Neonatal Network..... 117
Table 5.2a VLBW with BPD is Associated with Long-term Pulmonary Morbidity and Disability by 1-2 Year of Follow-up..... 118
Table 5.2b VLBW with BPD is Associated with Long-term Pulmonary Disability by 3 year of Follow-up..... 121
Table 5.2c VLBW with BPD is Associated with Long-term Pulmonary Disability by 6-12 year of Follow-up..... 122
Table 5.2d VLBW with BPD is Associated with Long-term Pulmonary Disability by 12-16 years of Follow-up..... 123
Table 5.3 Association of VLBW/Prematurity with Asthma or Hyper-reactive Airway Disease..... 125

Table 5.4 Association of VLBW/Prematurity with Rehospitalization for Respiratory Illness: Pulmonary Outcomes..... 127
Table 6.1 Association of VLBW/Prematurity with Growth Impairment..... 129
Table 6.2 Association of VLBW plus BPD with Growth Impairment..... 132
Table 6.3 Association of VLBW plus Antenatal Glucocorticoid Exposure with Growth Impairment..... 133
Table 6.4 Association of VLBW plus Necrotizing Entercolitis Exposure with Growth Impairment..... 133
Table 6.5 Association of VLBW plus Postnatal Nutrition with Growth Impairment..... 134
Table 6.6 Association of LBW/Prematurity to Growth Delay..... 136