On-line Table: Details of included MRI studies, scanned at >35 weeks' postmenstrual age

MRI Modality		Population	Timing of MRI (wk)	Main Findings
Structural conventional	Sie et al[52]	43 Infants <37 wks	36	Severe WM abnormalities had a PPV of 85%–100% for PDI[a] <70 at 18 mos and 100% PPV for the development of CP
	Skiöld et al[42]	117 Infants <27 wks	38–41	Moderate/severe WM abnormalities were related to neurodevelopment[a] at 30 mos; PPV for the development of CP was 50%; patients with DEHSI had normal outcome[a]
	Jeon et al[10]	126 Infants <32 wks	37	Cystic PVL and PWML were significantly related to CP; DEHSI was not related to adverse neurodevelopment[a] at 24 mos
	Iwata et al[59]	76 Infants <32 wks	38–42	WM injury predicted low full-scale IQ (OR, 8.3), CP (OR, 10.0), and requirements for special assistance at school (OR, 7.0) at 9 yrs; DEHSI and GM abnormalities were not associated with impaired outcome
	Woodward et al[57]	110 Infants <32 wks	Term	Extent of WM abnormalities were significantly related to executive-function ability at 4 yrs
	Spittle et al[45]	227 Infants <30 wks	38–42	Severity of WM abnormalities was related to proportion of severe motor impairment at 5 yrs; mild WM abnormalities had an OR of 5.6 for severe motor impairment
	Kidokoro et al[63]	160 Infants <30 wks	40	DEHSI was not related to neurodevelopmental outcome[a] at 24 mos
	Hart et al[51]	67 Infants <35 wks	37–44	Overt abnormalities were related to neurodevelopmental outcome[a] at 18 mos; DEHSI was not related to abnormal outcome
	de Bruïne et al[62]	110 Infants <32 wks	40–44	PWML (OR, 18.38) and ventricular dilation (OR, 4.57) predicted motor delay at 24 mos; PWML was also related to MDI[a] at 24 mos; DEHSI was not related to abnormal outcome
	Munck et al[53]	180 Infants <1500 g	Term	Major cerebral abnormalities were significantly correlated to decreased outcome[a] at 24 mos
	De Vries et al[67]	12 Infants <36 wks	40	Asymmetric PLIC caused by venous infarction predicted future hemiplegia
	Lind et al[69]	5 Infants <1500 g	Term	Caudothalamic cysts were not correlated to neurodevelopmental outcome[a] at 24 mos or intelligence at 5 yrs
	Hnatyszyn et al[43]	23 Infants <36 wks	38–40	Asphyxiated brain injury was correlated to the development of CP at 24 mos
	Clark and Woodward[58]	103 Infants <33 wks	40	Severity of brain injury (WM > GM) was strongly related to working memory at 6 yrs
	Spittle et al[55]	188 Infants <30 wks	38–42	WM abnormalities were associated with lower social-emotional competence at 24 mos
	Spittle et al[44]	86 Infants <30 wks	38–44	WM abnormalities were associated with motor outcome at 12 mos
	Brown et al[47]	168 Infants <30 wks	38–42	WM and GM abnormalities were correlated strongly to neurobehavioral performance at term age
	Spittle et al[9]	86 Infants <30 wks	38–44	Severity of WM abnormalities was related to abnormal general movement at 1 and 3 mos
	Reidy et al[60]	198 Infants <30 wks	Term	WM abnormalities predicted several language abilities at 7 yrs
	Edgin et al[56]	100 Infants <33 wks	39–41	Mild and moderate/severe WM abnormalities were correlated to lower executive-functioning performance at 2 and 4 yrs
	Nanba et al[46]	289 Infants <34 wks	36–43	PWML in the corona radiata above the PLIC were correlated to gross motor functions at 3–5 yrs
	Iwata et al[61]	210 Infants <36 wks	Term	Subtle WM injury was significantly related to full-scale IQ at 6 yrs
	Woodward et al[15]	167 Infants <30 wks	38–42	Increasing severity of WM abnormalities was associated with lower outcome[a] at 24 mos
	Mirmiran et al[16]	61 Infants <30 wks	36–40	PPV of brain lesions was 60% for the development of CP at 31 mos
	Valkama et al[17]	50 Infants <34 wks	39	Parenchymal lesions predicted CP at 18 mos; sensitivity, 82%; specificity, 97%
	Aida et al[48]	15 Infants <33 wks	35–45	Parenchymal lesions predicted CP at 12 mos
DTI	van Kooij et al[72]	64 Infants <31 wks	40–45	At 24 mos, PDI[a] was correlated to FA in the CC; fine-motor performance,[a] to FA in the major WM tracts; and gross motor performance,[a] to FA in the PLIC, fornix, and thalamus
	van Kooij et al[74]	69 Infants <31 wks	40–45	At 24 mos, PDI[a] was correlated to volume and length of the CC and right PLIC in girls; fine-motor performance[a] was correlated to volume and FA of the left PLIC in boys
	Kaukola et al[77]	30 Infants <32 wks	38–42	Higher ADC in the corona radiata was associated with poorer gross-motor outcome[b] at 24 mos

On-line Table: (Continued)

MRI Modality		Population	Timing of MRI (wk)	Main Findings
DTI	Rose et al[78]	78 Infants <32 wks	33–42	Neurodevelopmental outcome at 18 mos[a] was correlated to FA of the right PLIC
	Bassi et al[80]	37 Infants <33 wks	39–43	FA of the optic radiation was correlated with visual function at term-equivalent age
	Krishnan et al[73]	38 Infants <34 wks	38–44	Without focal brain injury, lower ADC in the WM was correlated to developmental outcome[b] at 24 mos
	Arzoumanian et al[79]	63 Infants <34 wks	34–42	FA in the PLIC was reduced in infants with abnormal neurologic examination findings at 24 mos
	Rogers et al[75]	111 Infants <30 wks	37–43	Higher ADC in the orbitofrontal cortex was correlated to social-emotional problems at 5 yrs
Volumetric	Boardman et al[76]	80 Infants ≤34 wks	38–44	Decreased development[b] was associated with decreased tissue reduction of WM and deep GM
	Jary et al[66]	25 Infants <30 wks	38–47	In infants with PHVD, total cerebral volume was correlated to MDI[a] and PDI[a] at 24 mos; thalamic and cerebellar volume were correlated to PDI[a]
	Tich et al[97]	182 Infants <30 wks	40	Biparietal diameter was correlated to neurodevelopmental outcome[a] at 24 mos
	Maunu et al[96]	225 Infants <1500 g	Term	Ventricular dilation with additional brain pathology was associated with CP and outcome[a] at 24 mos
	Lind et al[86]	164 Infants <1500 g	Term	PDI[a] and MDI[a] scores at 24 mos <70 was associated with larger ventricles and lower volume of cerebrum, cerebellum, frontal lobe, basal ganglia, and thalamus
	Spittle et al[98]	83 Infants <30 wks	38–40	Reduced cerebellar diameter was correlated to abnormal general movement at 3 mos
	Lind et al[87]	97 Infants <1500 g	Term	Reduced cerebellar volume was associated with poorer executive functions and motor skills at 5 yrs
	Thompson et al[93]	184 Infants <30 wks	38–42	Reduced hippocampal volume was related to neurodevelopmental outcome[a] at 24 mos
	Tan et al[85]	65 Infants <29 wks	40–43	Total brain volume was correlated to MDI[a] at 9 mos
	Beauchamp et al[94]	156 Infants <30 wks	38–42	Reduced hippocampal volume was related to working memory deficits at 24 mos
	Shah et al[92]	68 Infants <33 wks	Term	Inferior occipital brain regions were correlated to impaired oculomotor-function control at 24 mos
	Shah et al[88]	83 Infants <32 wks	38–43	Reduced cerebellar volume was associated with WM injury and outcome[a] at 24 mos
	Woodward et al[54]	92 Infants <32 wks	39–41	After correcting for WM injury, total brain volume was correlated to object working memory at 24 mos
	Inder et al[28]	119 Infants <33 wks	39–41	Decreased cortical and deep GM volumes and increased CSF volumes were correlated to neurodevelopmental disability at 12 mos
	Peterson et al[90]	10 Infants <37 wks	35	Sensorimotor and midtemporal WM volumes were correlated strongly with outcome[a] at 20 mos
	Valkama et al[95]	51 Infants <34 wks	Term	Reduced brain stem volume was associated with neurosensory disability at 18 mos
^{1}H-MRS	Gadin et al[91]	38 Infants <30 wks	36	Decreased subcortical GM was associated with low PDI[a] at 6 mos; MRS measurements did not correlate with neurodevelopmental outcome[a]
	van Kooij et al[89]	112 Infants <31 wks	39–45	Cerebellar volume and cerebellar NAA/Cho ratio were positively correlated to MDI[a] at 24 mos

Note:—PHVD indicates posthemorrhagic ventricular dilation; CP, cerebral palsy; OR, odds ratio; PPV, positive predictive value; CC, corpus callosum; GM, gray matter; PDI, Psychomotor Development Index; MDI, Mental Development Index; PVL, periventricular leukomalacia.

[a] Bayley Scales of Infant Development.

[b] Griffiths Mental Developmental Scales.