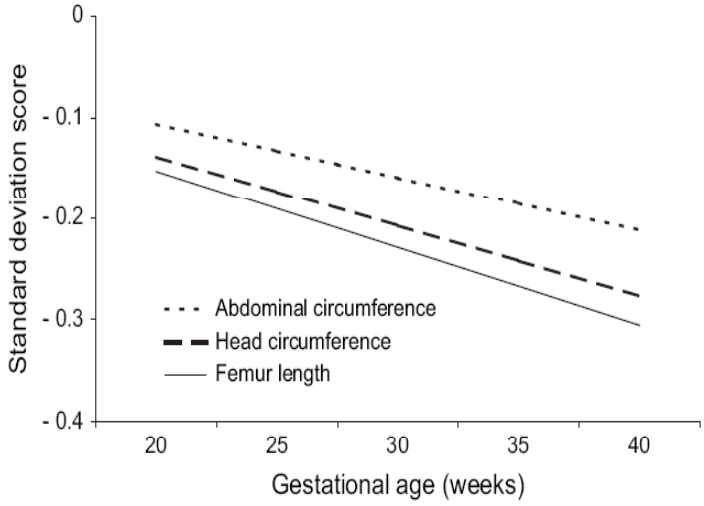
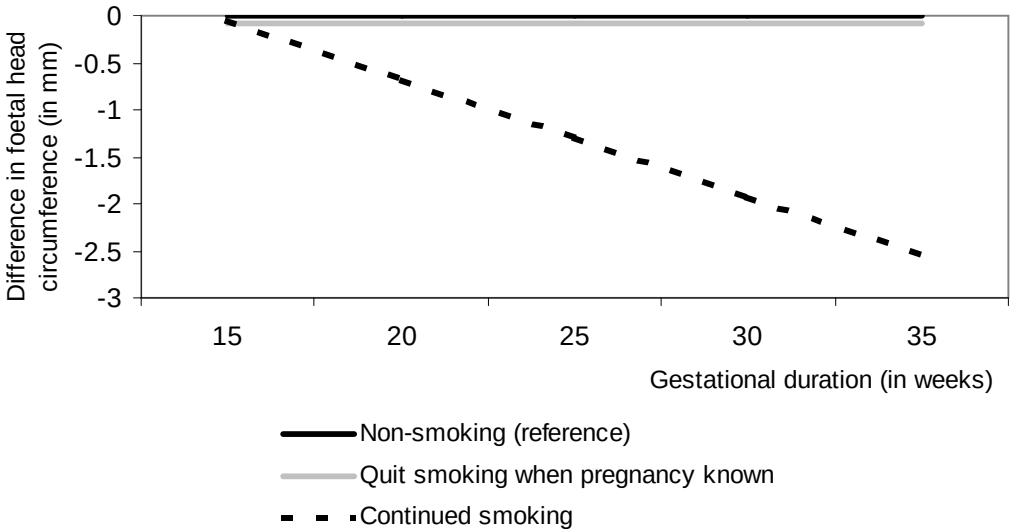
Smoking and fetal growth



Jaddoe V, Am J Epidemiol 2007

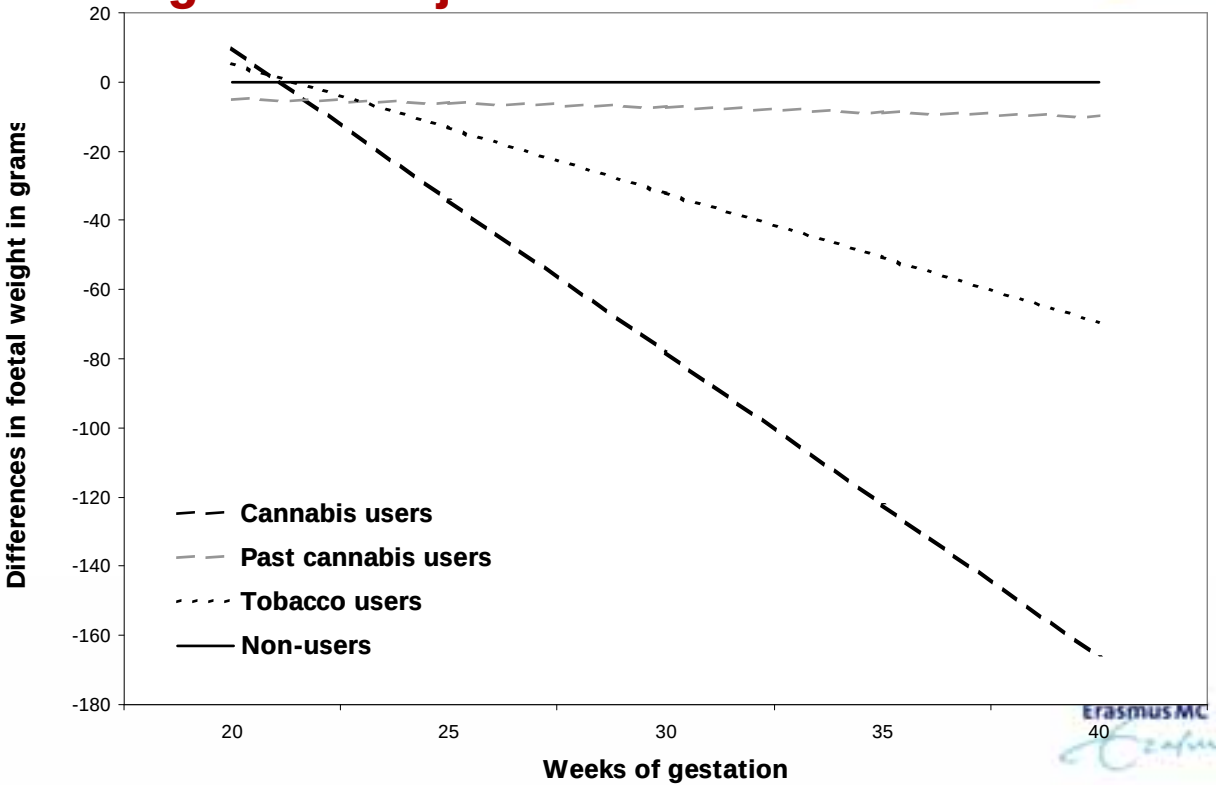
Smoking and prenatal head growth



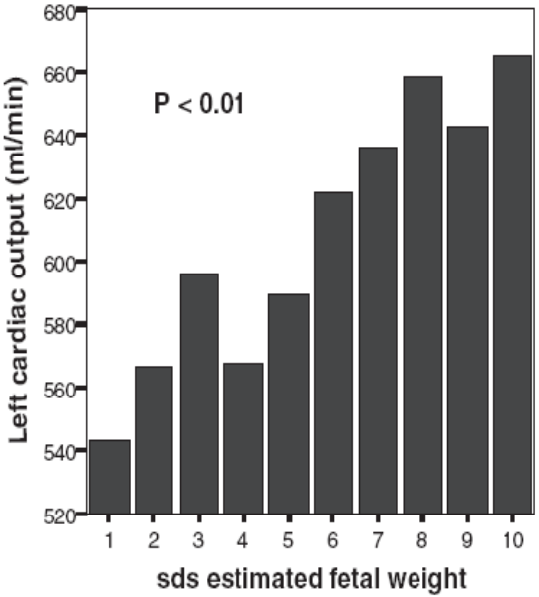
Children of mothers who continue smoking also have smaller cerebelli and smaller cerebral ventricles

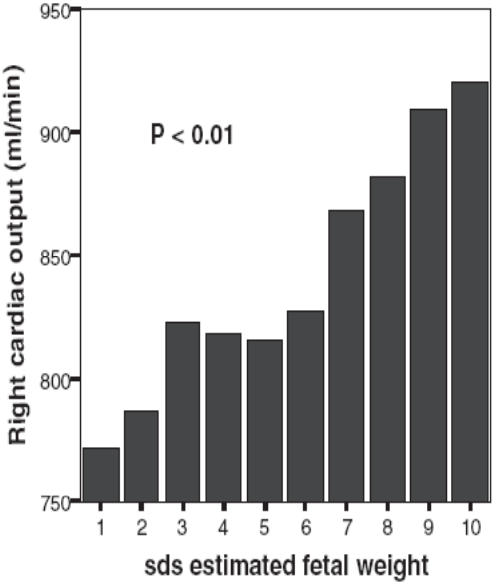
Roza et al., Eur Neuroscience 2007

Cannabis use in early pregnancy and fetal growth trajectories



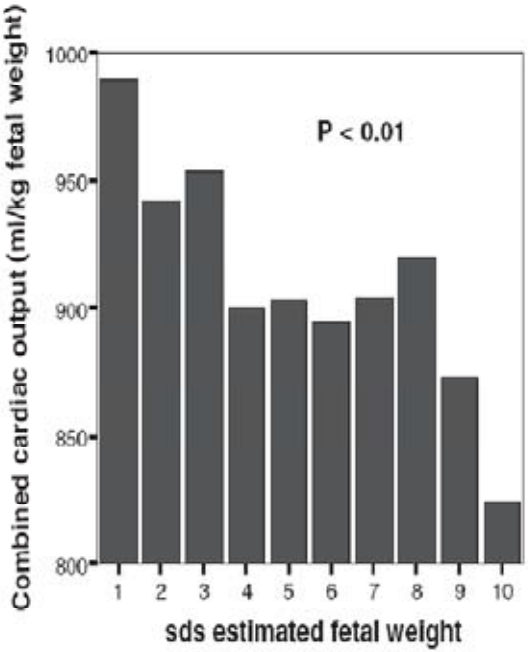
Fetal growth and cardiovascular adaptation





Verburg BO, Circulation 2008

Cardiac sparing

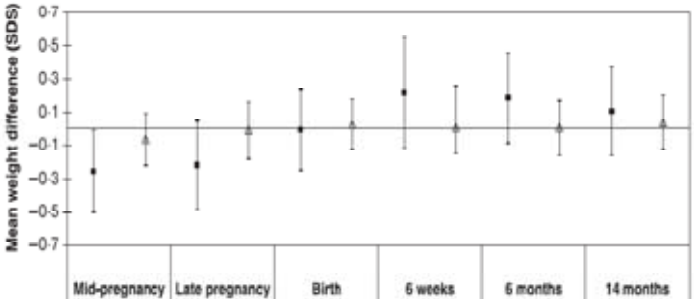


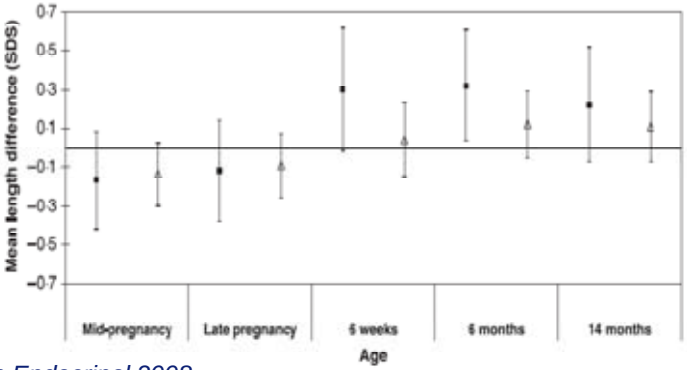
Verburg BO, Circulation 2008

Insulin and IGF-1 genes

- Related to development of type 2 diabetes
- Possible role in fetal growth
- IGF-1 SNPs

IGF-1 192bp polymorphism: effect on growth





Geelhoed JJM, Clin Endocrinol 2008

IGF-1 192bp polymorphism:

Catch up growth (expressed as relative odds)

Genotype	
Homozygous 192-bp	Reference
Heterozygous 192-bp	1.79 (1·10–2·90)*
Noncarriers 192-bp	2.28 (1·12–4·67)*

Geelhoed JJM, Clin Endocrinol 2008

IGF-1 192bp polymorphism:
Effect on blood pressure at the age of 2 years

Genotype	SBP (mmHg)	DBP (mmHg)
Model 1		
Homozygous 192 bp	Reference	Reference
Heterozygous 192 bp	−2.5 (−4.5, −0.4)*	−1.7 (−3.9, 0.4)
Non-carriers 192 bp	−4.6 (−7.9, −1.4)†	−3.5 (−6.9, −0.1)*
Model 2		
Homozygous 192 bp	Reference	Reference
Heterozygous 192 bp	−2.3 (−4.3, −0.2)*	−1.4 (−3.5, 0.8)
Non-carriers 192 bp	−4.4 (−7.8, −1.1)†	−3.5 (−6.9, −0.1)*

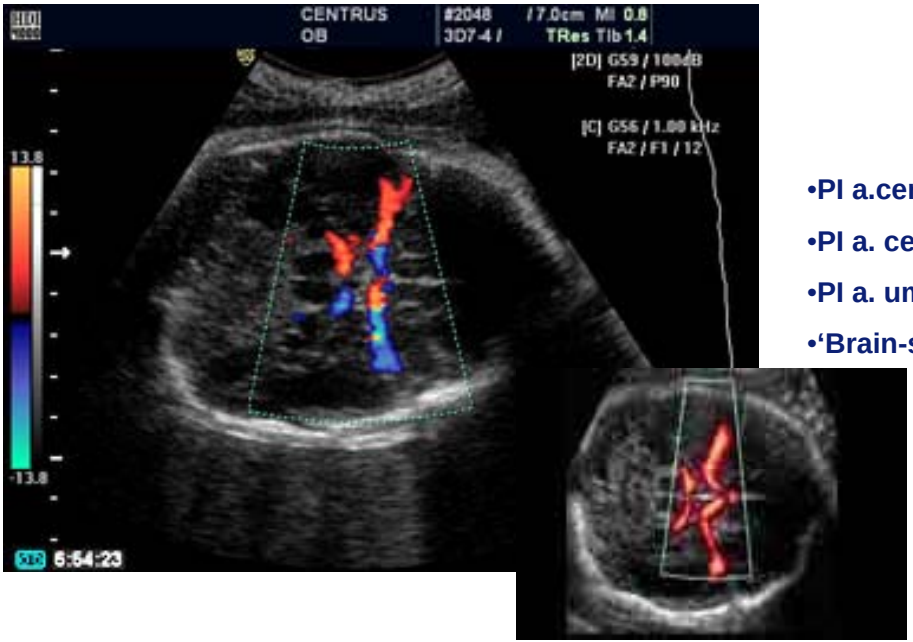
Van Houten, V, Eur J Endocrinol 2008

IGF-1 192bp polymorphism:
Effect on lymphocytes subpopulations at birth

	Lymphocyte subsets		
192-bp allele	**T**	**B**	**NK**
Homozygous	Reference	Reference	Reference
Heterozygous	-1 (-9, 7)	2 (-11, 16)	7 (-8, 22)
Non-carrier	-13 (-25, -1)*	-21 (-40, -1)*	-11 (-33, 12)

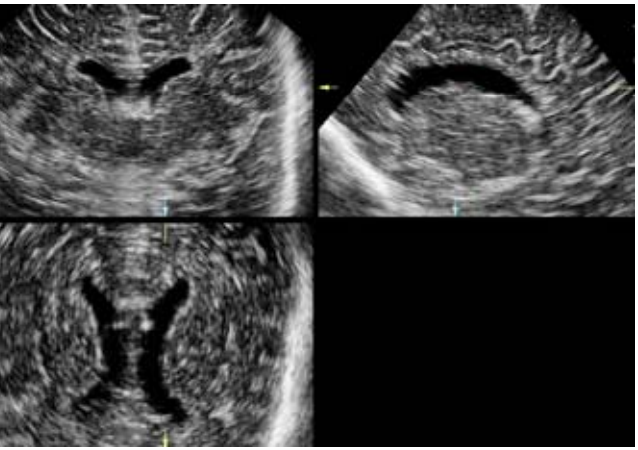
Duijts L, Clin Endocrinol 2008

Pre and early postnatal brain imaging
Foetal blood flow measurements

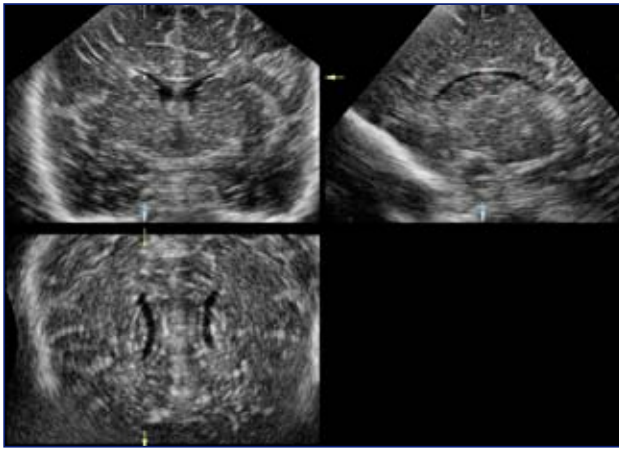


- **PI a.cerebri media**
- **PI a. cerebri anterior**
- **PI a. umbilicalis**
- **'Brain-sparing' effect**

Postnatal 3D-brain ultrasound (Focus cohort)



Large ventricles

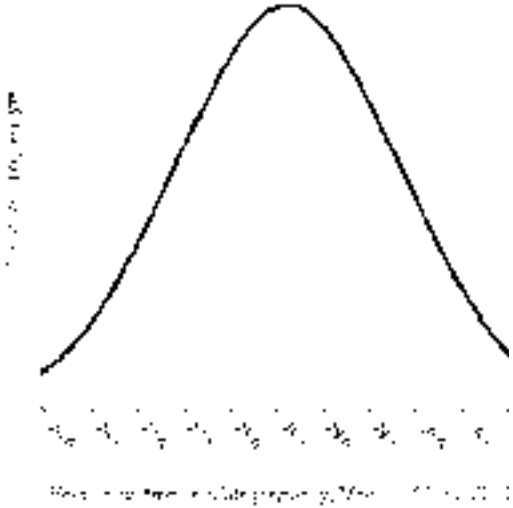


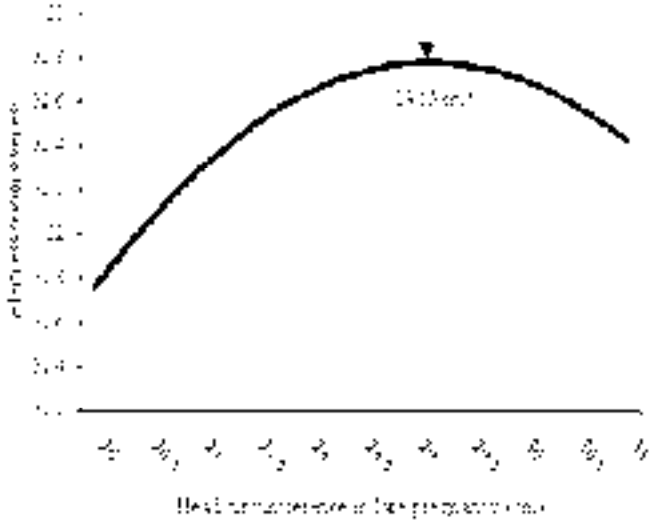
Small ventricles

Age 6 weeks

Foetal size in late pregnancy and infant alertness at 3 months

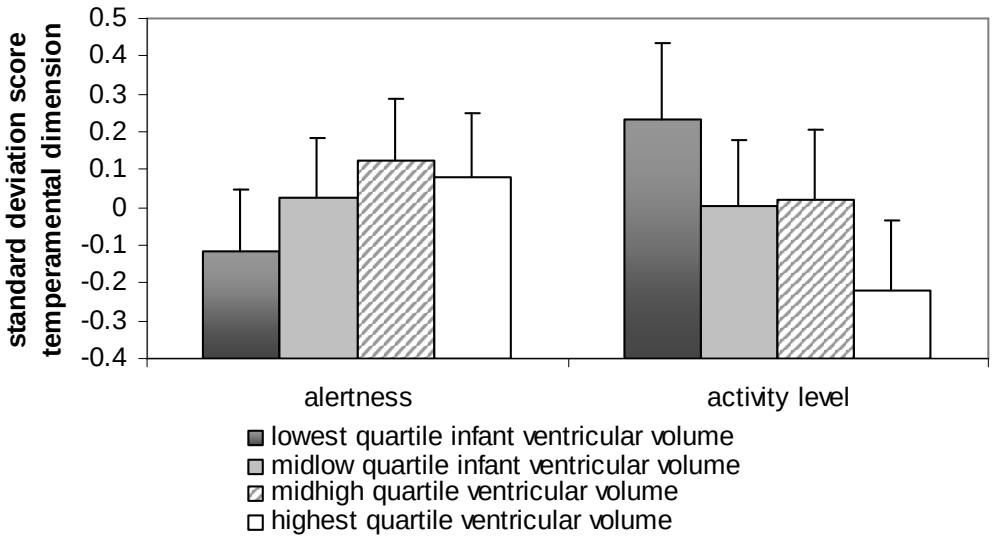
Head circumference *in relation to* *infant alertness*





Henrichs et al., Dev Psychobiol 2008

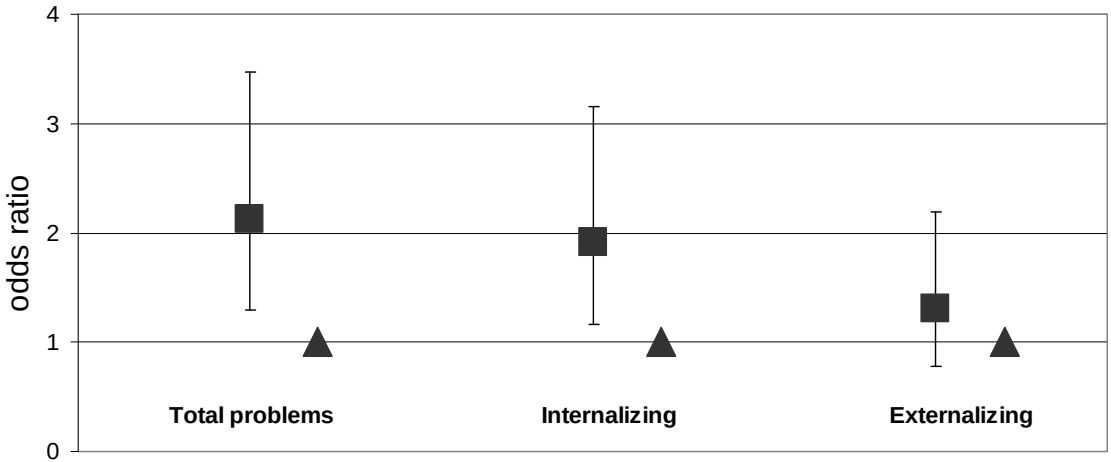
Ventricle volume and temperament

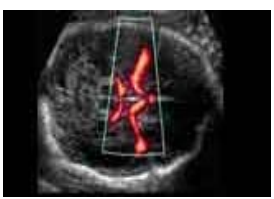


Children with small ventricles also have higher distress levels

Roza et al., J Psychiat Neuro 2008

Foetal blood flow and behavioural problems





Effects op emotional-reactive and attention problems

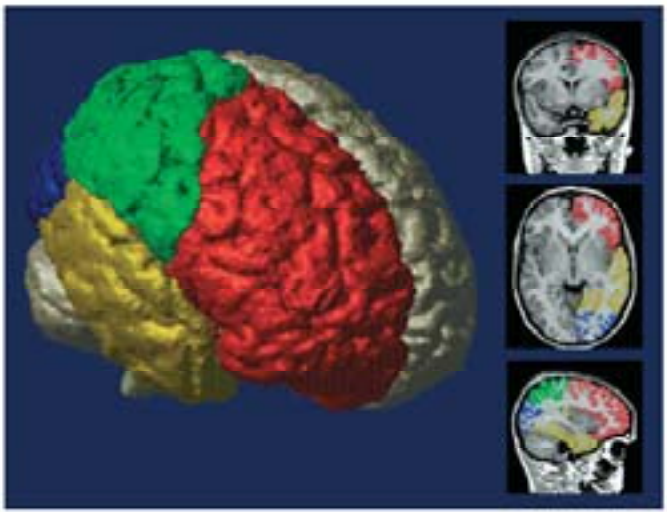
Roza et al., Am J Epi 2008

New projects

The phantom or mock scanner

Prenatal nicotine and the child brain

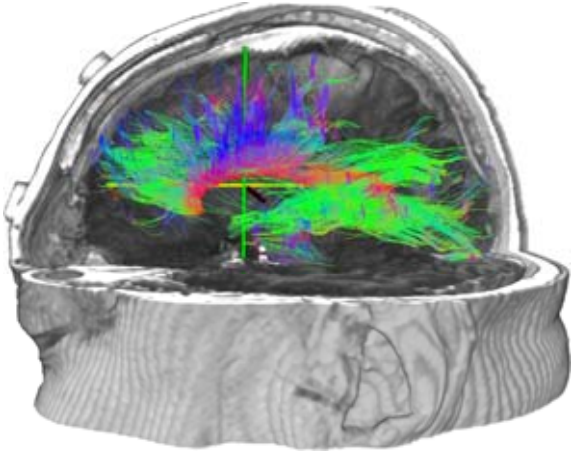
- is there an effect of prenatal nicotine exposure on brain development of 6 year-old children?

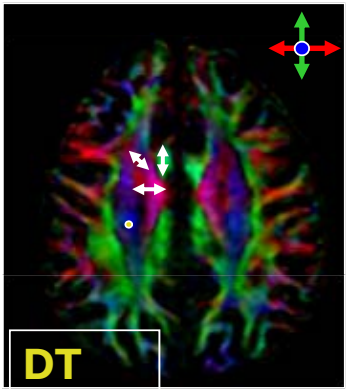


Erasmus MC

Cognition and white matter development

- Children with a high level of cognitive functioning will have a different growth trajectory of white matter than children with a low level of cognitive functioning.





Fillard et al. IEEE Trans Med Imaging 2007

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Principal investigators

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Clinical fellows, PhD students, junior post-docs

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Generation R

Thank you