

Netherlands Center for Occupational Diseases



Working conditions and preconception care

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Content of presentation

- Short introduction on reproduction and work
- Health Council Report "Preconception care: a good beginning" with focus on working conditions. 2007.
- Some parts of the Dutch Guideline for Occupational Physicians "Pregnancy, postpartum period and work" 2007; www.gr.nl Publ.no. 2007/19

Factors known to have impact on pregnancy outcome (Steeegers, 2005)

- Medical history
- Obstetric history
- Infections
- Congenital malformations
- Hereditary illnesses within the family
- **Working conditions**
- Nutrition
- Smoking
- Alcohol consumption
- Use of drugs like heroin and cocaine
- Medications

Preconception care



Working conditions around conception: relevant chemical exposures

- Organic solvents
- Anesthetics
- Cytostatics
- Pesticides

Evidence working factors: organic solvents

Exposure of women and man to high concentrations of organic solvents *before* conception

and for women *during their early pregnancy* leads to a higher risk of spontaneous abortions or congenital malformations

(Level of evidence: level 2)

Evidence working conditions: anesthetics

Women occupationally exposed to anesthetics during their (early) pregnancy have a higher risk of spontaneous abortions than women not exposed to anesthetics during this period.

(Level of evidence: level 2)

Handling of cytostatics around 1980



Handling of cytostatics today



Evidence working factors: cytostatics

Pregnant women exposed to cytostatics during the early phase of their pregnancy have a higher risk on spontaneous abortion or fetal death.

(Level of evidence: level 2)

Evidence working conditions: pesticides

- Women exposed to pesticides during the early phase of their pregnancy have a higher risk of a child with spina bifida or an oral cleft defect
(level of evidence: level 2)
- Exposure of the father to pesticides around the conception increases the risk of fetal death due to congenital malformations.
(level of evidence: level 3)

Advice of Committee of Health Council Chemical exposure I

- No exposure around the conception, during pregnancy and breast feeding to substances with a direct genotoxic working mechanism, like mutagenic and most carcinogenic substances
- Due to the working mechanism, no safe threshold limit value can be given for these substances

Advice of Committee of Health Council Chemical exposure II

- Chemicals that are harmful to the fetus or the newborn child, known to have no genotoxic working mechanism, can probably be safely used.
- If no safe limit value can be given, zero exposure is recommended.

Advice of Committee of Health Council Chemical exposure III

- If the harmful effects on reproduction of a certain chemical have been taken into account in setting up the maximum exposure levels given in the Occupational Health and Safety Act, then the chemical can be used below that limit value
- If there is lack of information or if the data on that particular chemical are not clear enough: zero exposure is recommended.

**Dutch Guideline
for occupational physicians
“Pregnancy, postpartum period and work”**

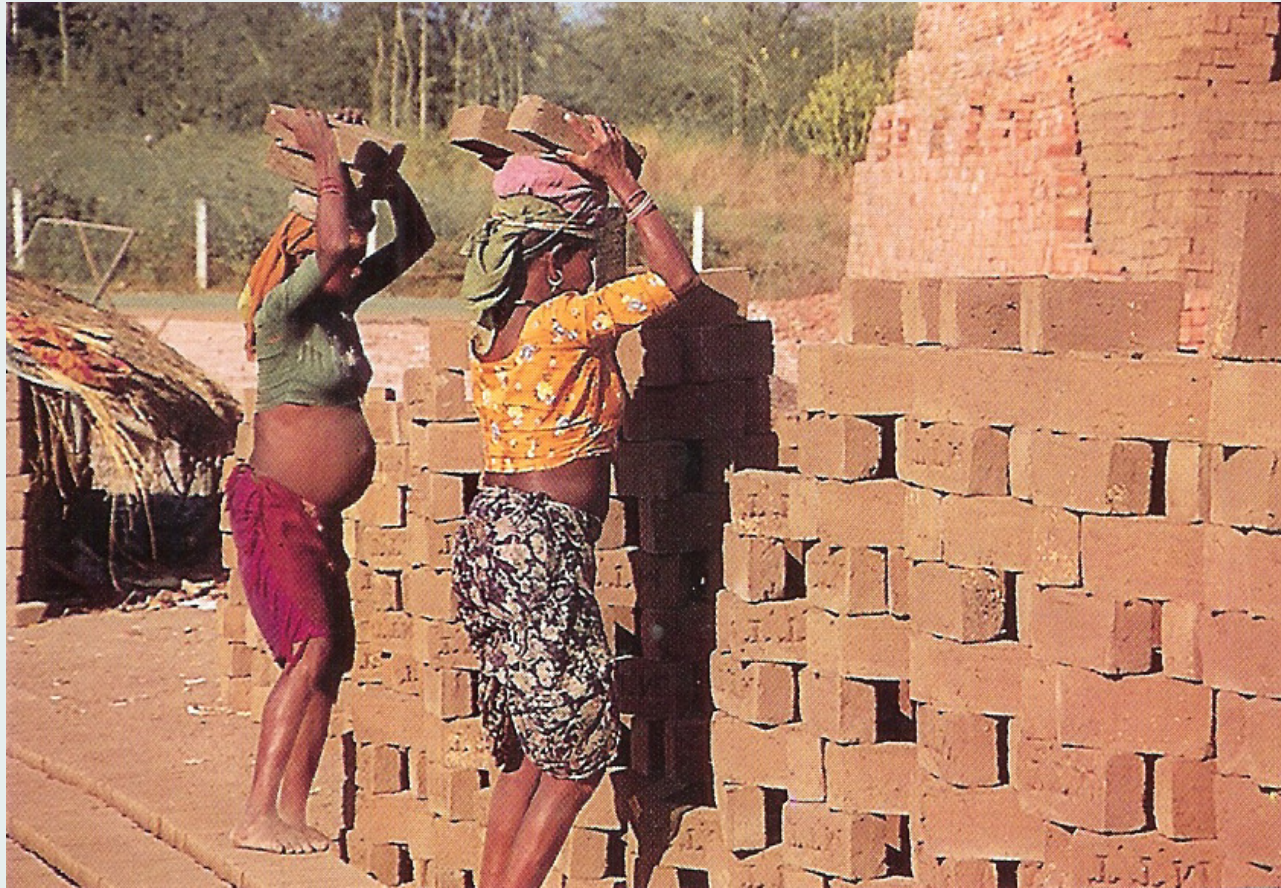
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**Relevant working conditions during the
early pregnancy
(Guideline Dutch Occupational
Physicians)**

- Heavy physical work load
- Heavy mental work load.
- Shift work

Heavy physical work load



**Effects of heavy physical work load during
pregnancy (from meta-analysis
Mozurkewich et al., 2000)**

Pregnancy complication	Odds ratio	95% CI
Preterm birth	1,22	1,16-1,29
Low birthweight	1,37	1,30-1,44
Hypertension & pre-eclampsia	1,60	1,30-1,96

According to the guideline a pregnant woman should limit her physical work load per working day from the 20th of pregnancy onwards to

- 5 x 10 kg lifting
- 25 times bending
- 2 hours standing
- 3 hours walking
- 5 x 15 steps on staircases

Heavy mental work load (ander plaatje svp)



Heavy mental work load

Heavy mental workload consisting of a combination of high demands, low control and lack of social support can lead to work stress

Work stress during the first trimester of pregnancy has been associated to a higher risk on spontaneous abortion and low birthweight.

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Shift work



Shift work and pregnancy complications

Outcome	Odds ratio	95% CI	Author
Spontaneous abortions	1,25		MacDonald et al., 1988
Preterm birth	1,24	1,06-1,46	Mozurkewich et al., 2000

Advice on working hours during pregnancy (from the Guideline)

- From the 20th week of pregnancy no night shifts between 23.00 and 07.00 hours
- No overtime, maximum 9 hours per day and 40 hours per week

Effectiveness of interventions in working conditions on pregnancy complications I (Croteau et al. 2006 & 2007)

- Case control study of 1536 cases of small – fro-gestational-age infants and 4441 controls.
- The effectiveness of adaptations of the working conditions before the 24th week of pregnancy was investigated.

Effectiveness of interventions in working conditions on pregnancy complications I (Croteau et al. 2006 & 2007)

- The higher risk of pregnancy of heavy physical, mental work load as well as shift work nearly disappeared when the work was adapted before the 24th week of pregnancy
- The incidences of pregnancy complications were not different from the outcomes of non-exposed women.

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