# Neurotoxicity of cancer treatment: Neurocognitive dysfunction and underlying mechanisms

Published: 30-10-2006 Last updated: 09-05-2024

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Ethical review	Approved WMO
Status	Pending
Health condition type	Leukaemias
Study type	Observational invasive

## Summary

### ID

NL-OMON29855

**Source** ToetsingOnline

**Brief title** Neurotoxicity of cancer treatment

### Condition

• Leukaemias

**Synonym** acute lymphoblastic leukemia (ALL), blood cancer

#### **Research involving** Human

### **Sponsors and support**

**Primary sponsor:** Universiteit Leiden **Source(s) of monetary or material Support:** KWF Kankerbestrijding

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### Intervention

Keyword: ALL, late effects, neuroimaging, neurotoxicity

#### **Outcome measures**

#### **Primary outcome**

Outcomes will be a neuropsychological deficit profile, a profile of structural

and functional integrity of neural networks and descriptions of quality of

life. Profiles of the different patient groups and controls will be

contrasted.

#### Secondary outcome

Coincidental findings of secundary tumors after radiation will be registered.

# **Study description**

#### **Background summary**

Due to improved treatment, over 80% of children with acute lymphoblastic leukaemia (ALL) are now long term survivors. Central nervous system prophylaxis is an essential part of current ALL treatment. Cranial radiation treatment (CRT) has been reported to cause long term neurocognitive and academic deficits among survivors. The literature suggests that also treatment with chemotherapy exclusively \* since 1984 the standard type of treatment in The Netherlands \* is associated with neuropsychological sequelae, in particular in the domain of executive functions.

Much of the information on long term sequelae of treatment, also from our previous study\*, relates to outcomes within the first 5 \* 10 years following treatment. Data on long term consequences beyond this time frame are insufficient. In addition, the greatest gap in our knowledge regarding treatment-related cognitive changes is a lack of understanding of the mechanism(s) that account for these sequelae. So far, abnormalities detected by structural (conventional) MRI have not consistently been found to correlate with clinical findings and neurocognitive status. More sensitive imaging measures that have recently been developed, are considered necessary. As in other countries cranial radiation is still an important option in the treatment of childhood ALL, and because in other diseases CRT is unavoidable, the study of CRT-related consequences may provide important information. We hypothesize that long-term unfavourable effects of treatment of childhood ALL are reflected in a neuropsychological profile emphasizing executive function (EF) deficits. This deficit profile may be more outspoken in survivors treated with chemotherapy and cranial radiation (vs. treated with chemotherapy only). As the quality of executive functions is, above all, dependent on the integrity of functional networks of the brain, it is hypothesized that EF deficits are associated with disruptions of neural networks. These disruptions may be more severe in survivors treated with cranial radiation in addition to chemotherapy.

\* Effects of Chemotherapy on Attention and Information Processing in Survivors of Childhood Cancer (KWF, project number: AZVU 2001 - 2390). De Sonneville LMJ, Veerman AJP (principal investigators), Buizer AI (research physician)

#### **Study objective**

With this information we hope to be able provide ex-patients with more detailed information about late effects of treatment. Also it is a very important step towards ajusting current treatment protocol to prevent late effects as much as possible.

#### Study design

The study will be purely observational. It will include a neuropsychological assessment to determine the neuropsychological deficit profile of long-term survivors of childhood ALL, neuroimaging of the brain to bring out disruptions in the functional integrity of neural networks (MEG, (f)MRI, DTI) and questionnaires on quality of life.

#### Study burden and risks

Patients will be requested to visit the VUmc twice: the first time for neuropsychological assessment (2 h) and MEG acquisition (1 h 45 min), the second time for an MRI scan (1 h). Furthermore they will be asked to complete a questionnaire at home and bring it on their first visit. Subjects will be consulted about a convenient time for the appointments.

# Contacts

**Public** Universiteit Leiden

Wassenaarseweg 52 2333 AK Leiden

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NL **Scientific** Universiteit Leiden

Wassenaarseweg 52 2333 AK Leiden NL

## **Trial sites**

### **Listed location countries**

Netherlands

# **Eligibility criteria**

Age Adults (18-64 years) Elderly (65 years and older)

### **Inclusion criteria**

Being treated for ALL according to DCLSG protocol ALL 5 (1979 - 1984) or according to DCLSG protocol ALL 6 (1984 - 1988)

### **Exclusion criteria**

Use of centrally acting drugs, active psychiatric disease or symptoms, pre-existing CNS disorders, insufficient mastery of Dutch language.

## Study design

### Design

Study type: Intervention model: Observational invasive Other

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Allocation:	Non-randomized controlled trial
Masking:	Open (masking not used)
Control:	Active
Primary purpose:	Other

### Recruitment

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NL	
Recruitment status:	Pending
Start date (anticipated):	01-11-2006
Enrollment:	338
Туре:	Anticipated

### **Ethics review**

Approved WMO	
Application type:	First submission
Review commission:	METC Amsterdam UMC

## **Study registrations**

### Followed up by the following (possibly more current) registration

No registrations found.

### Other (possibly less up-to-date) registrations in this register

No registrations found.

### In other registers

Register CCMO ID NL13950.029.06