# Early detection of acute and early-onset cardiovascuLar toxicity in children with cancer using a multiparametric approach.

No registrations found.

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|---|---|
| **Ethical review** | Positive opinion |
| **Status** | Recruiting |
| **Health condition type** | - |
| **Study type** | Observational non invasive |

## Summary

### ID

NL-OMON22737

**Source**
NTR

**Brief title**
EARLY study

**Health condition**

Childhood Cancer

### Sponsors and support

**Primary sponsor:** Princess Maxima Center
**Source(s) of monetary or material Support:** KiKa

### Intervention

### Outcome measures

**Primary outcome**

1. Echocardiography systolic dysfunction at pretreatment, 3-4 months after start treatment

and 1-year post start treatment:
• A change in left ventricular ejection fraction (EF) (echocardiography), defined as a decline in EF of >10% from baseline measurement or a decrease to a value <50% or symptomatic heart failure
• A change in left ventricular fractional shortening (echocardiography), defined as a decline in fractional shortening of >10% from baseline measurement or to a value <28% or symptomatic heart failure
• A change in left ventricular global longitudinal strain (GLS) measurements (echocardiography), defined as >15% decline in GLS from baseline measurement
2. Presence of myocardial fibrosis (MRI) at pretreatment, 3-4 months after start treatment and 1-year post start treatment expressed by increased myocardial T1 values, ECV (extracellular volume), and/or delayed enhancement.

**Secondary outcome**

N/A

# Study description

**Background summary**

The survival of children with cancer (CC) has improved considerably over the last decades at the expense of considerable late effects. Our previous study showed that the estimated risk of symptomatic cardiac disease is 9.6%, 40 years after treatment due to anthracyclines and radiotherapy (Feijen et al. 2018 submitted). Current treatment protocols and guidelines for follow-up care recommend screening by echocardiography during and after treatment.

Early detection of subclinical cardiotoxicity during treatment is crucial, to allow for timely intervention and to prevent further progression of cardiac disease. Despite the ubiquitous availability and low costs, serial routine echocardiography is not suitable to detect early preclinical abnormalities because it only allows to detect overt systolic cardiac dysfunction. Recently introduced advanced echocardiography and magnetic resonance imaging (MRI) techniques have demonstrated the potential to detect subclinical cardiac abnormalities in an earlier phase with myocardial deformation analysis, quantification of myocardial fibrosis and scar tissue, and delineation of the maladaptive changes of the heart in response to myocyte injury.

The aim of the proposed study is to assess the extent to which early, subclinical cardiac dysfunction can be identified with advanced echocardiography and MRI techniques at specific time-points prior, during and shortly after initiation of treatment (for acute and early onset cardiotoxicity) in children receiving anthracyclines and/or radiotherapy as part of their cancer treatment. Combined with a detailed medical history and electrocardiogram (ECG) for potentially increased susceptibility for cardiotoxicity, this will allow for a comprehensive assessment of potential risk factors and disease course of early cardiac disease, and provide

insights for potential new strategies to treat and/or prevent early and late cardiac disease.

### Study objective

The primary objective is to prospectively identify cardiac damage in childhood cancer patients, during and shortly after treatment with anthracyclines.

### Study design

Pre-anthracycline treatment, 3-4 months after start anthracycline treatment, 1-year after start anthracycline treatment

### Intervention

N/A

## Contacts

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## Eligibility criteria

### Inclusion criteria

In order to be eligible to participate in this study, a subject must meet all of the following criteria;
We will include 2 groups of CC patients in our study:
1) 100 CC patients receiving anthracyclines as part of their cancer treatment in the Princess Máxima Center for Pediatric Oncology (group 1).
2) A subgroup of 30 CC patients aged > 8 years, diagnosed with HL, ES, OS or STS, receiving anthracyclines as part of their cancer treatment and will undergo MRI evaluation as part of their tumor response evaluation. (group 2).

All children and/or their parents will be asked for informed consent for cardiac screening with the described multimodality approach using echocardiography, ECG and future cardiac blood biomarkers and genetic testing. Patients who meet the inclusion criteria for group 2, will be asked for an additional informed consent to also undergo cardiac MRI.

### Exclusion criteria

A potential subject who meets any of the following criteria will be excluded from participation in this study:
Exclusion criteria are children with severe comorbidity (being too sick for evaluation), history of thoracic radiation or chemotherapy for other malignancies, general contraindications for MRI for the patients in the MRI study group. Patients who need anaesthesia for MRI scanning will be excluded from the study.

## Study design

### Design

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| Study type: | Observational non invasive |
| Intervention model: | Other |
| Allocation: | Non controlled trial |
| Masking: | Open (masking not used) |
| Control: | N/A , unknown |

### Recruitment

NL

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|---|---|
| Recruitment status: | Recruiting |
| Start date (anticipated): | 23-11-2020 |
| Enrollment: | 100 |
| Type: | Anticipated |

### IPD sharing statement

**Plan to share IPD:** Undecided

## Ethics review

Positive opinion

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|---|---|
| Date: | 23-08-2019 |
| Application type: | First submission |

# 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 | ID |
|---|---|
| NTR-new | NL7980 |
| Other | METC UMCU : 71056 |

# Study results