Società Italiana di Ematologia

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# Valutazione della cardiotossicità precoce con tecnica di Global Longitudinal Strain (2D-GLS) in pazienti affetti da linfoma trattati con chemioterapia +/- radioterapia mediastinica: studio prospettico osservazionale Cardiocare.

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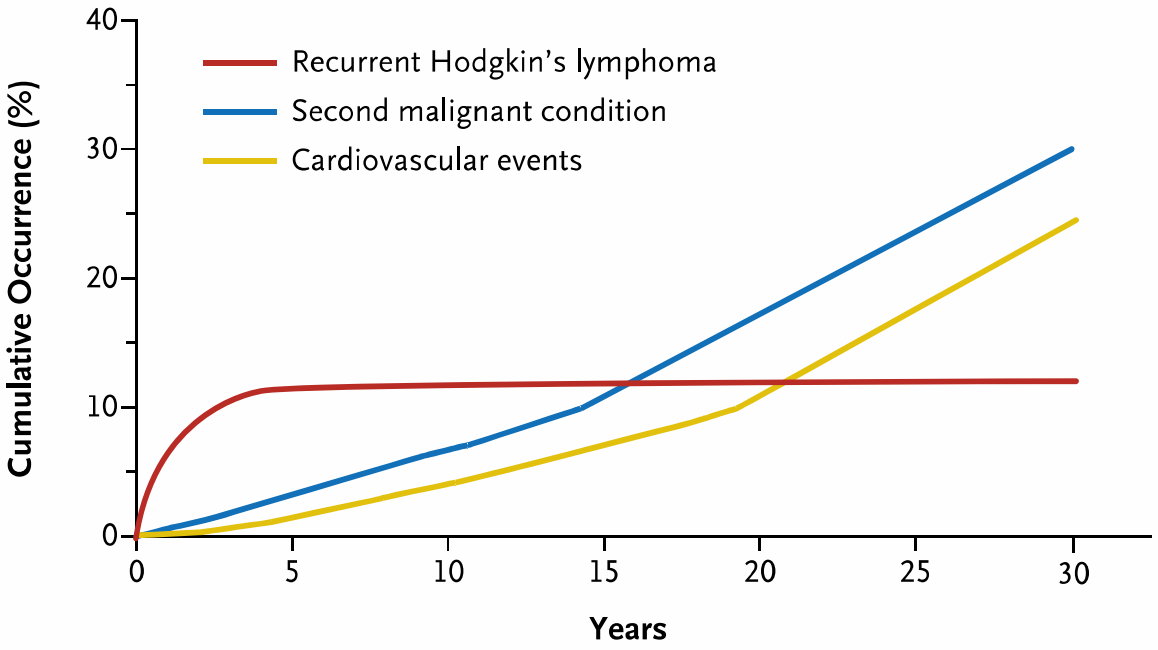
# DISCLOSURE

Barbara Botto

No disclosure

# The price of success: Long term complications




***Armitage J, NEJM 2010***

## Heart toxicity

- ❑ **Anthracycline base chemotherapy**
- ❑ **Mediastinal radiotherapy**

# How to prevent Heart Toxicity…?

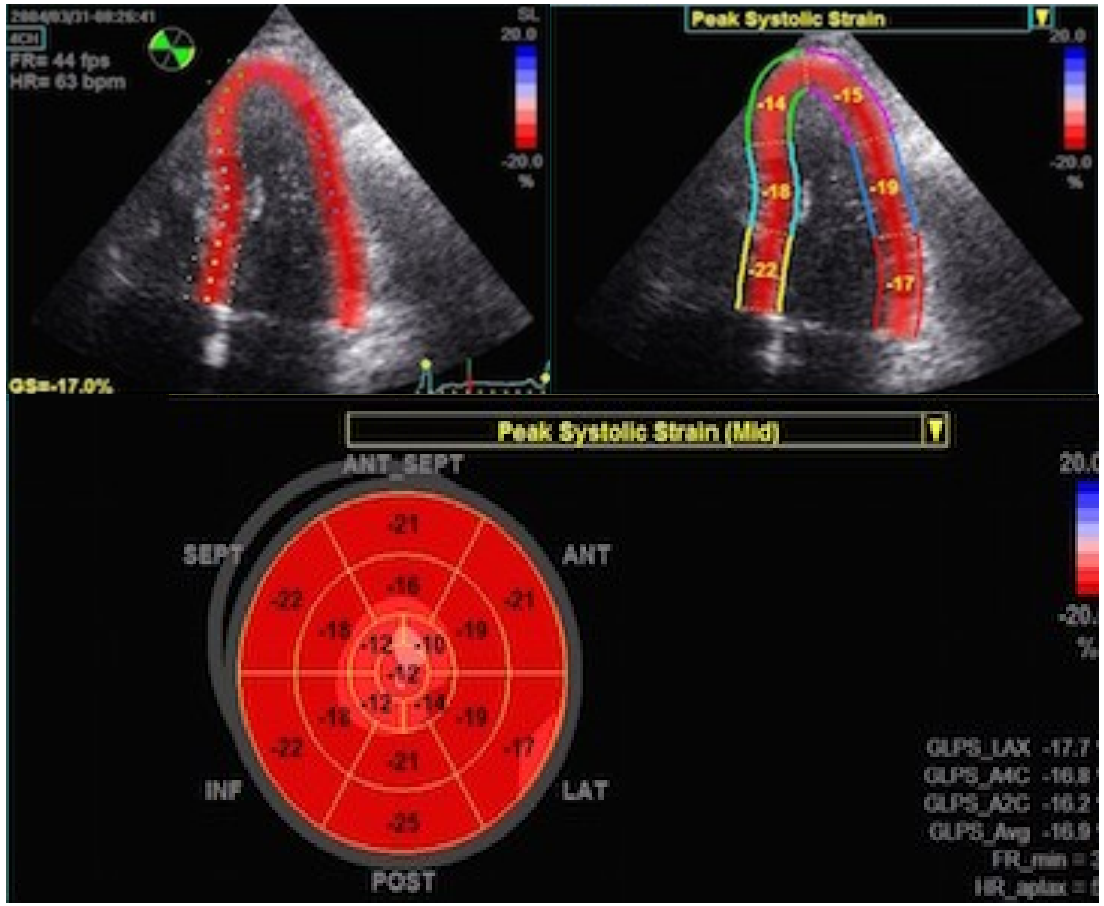
## PRIMARY PREVENTION

- Management of cardiac risk factors
- Avoidance/reduction of cardiotoxic treatments
- Technical improvement
- Cardioprotective drugs

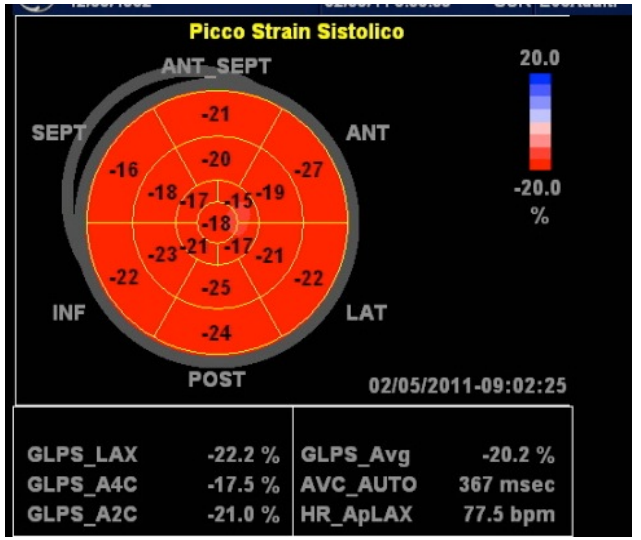
## SECONDARY PREVENTION
**(early diagnosis)**

- Diagnostic tools
  1. Biomarkers *(Troponine, NTproBNP, miRNA)*
  2. Echocardiography
  3. Cardiac MRI
  4. Coronary angiography CT scan

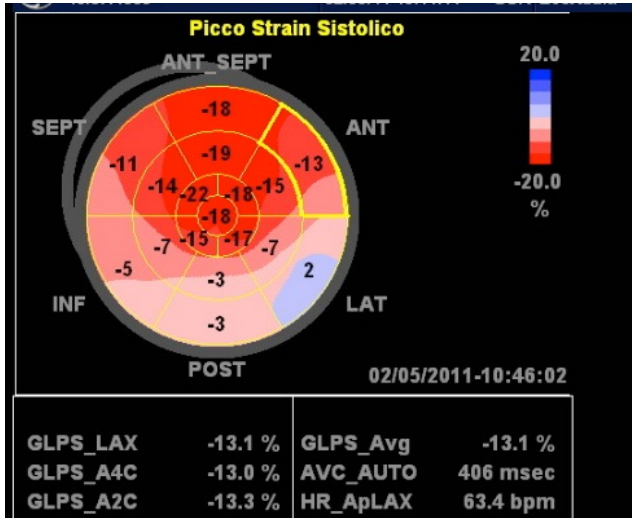
# Advanced echocardiography: Global Longitudinal Strain (GLS)



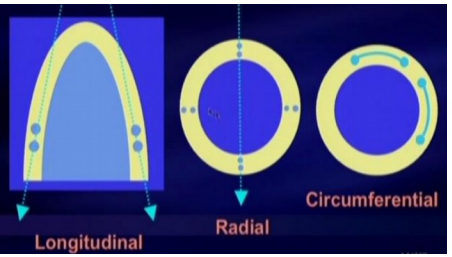

**Normal**
**GLS systolic peak**

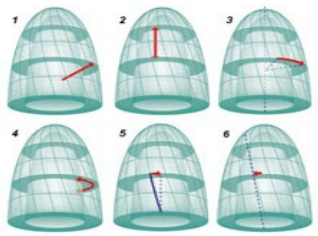


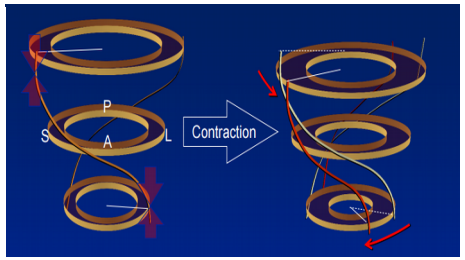

**After STEMI**
**GLS systolic peak**



# CARDIOCARE Project



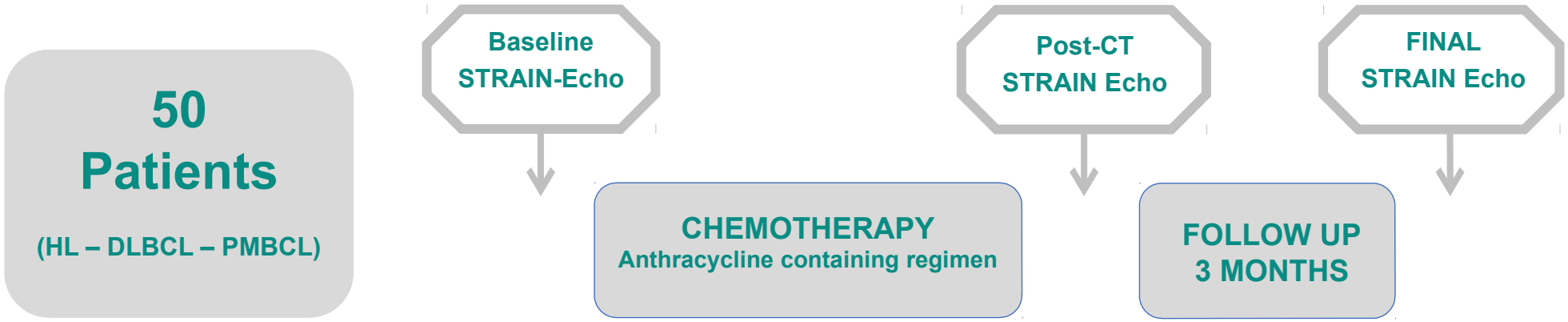



***Aim**: To evaluate with GLS (Global longitudinal strain) early and subclinical chemo/radiation-induced heart alterations in patients affected with HL, DLBCL or PMBCL*

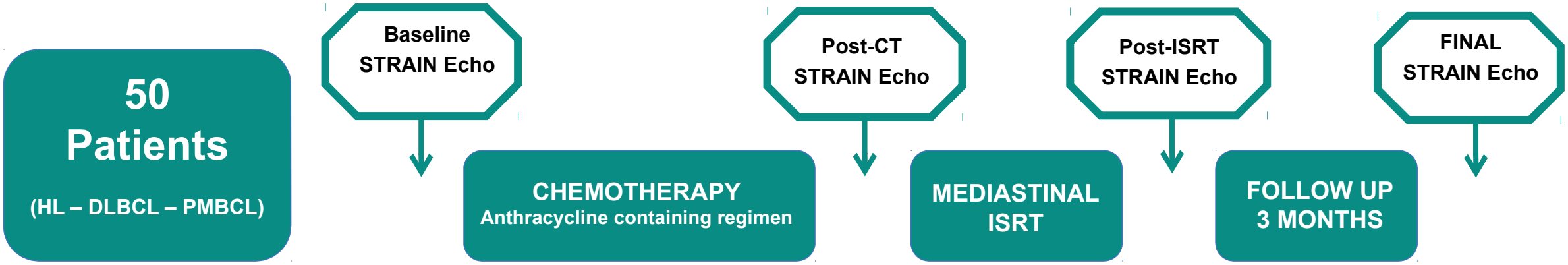
*GLS reduction > 15% considered as abnormal*

# CARDIOCARE Project

## Cohort A: CHEMOTHERAPY ALONE




## Cohort B: COMBINED MODALITY TREATMENT



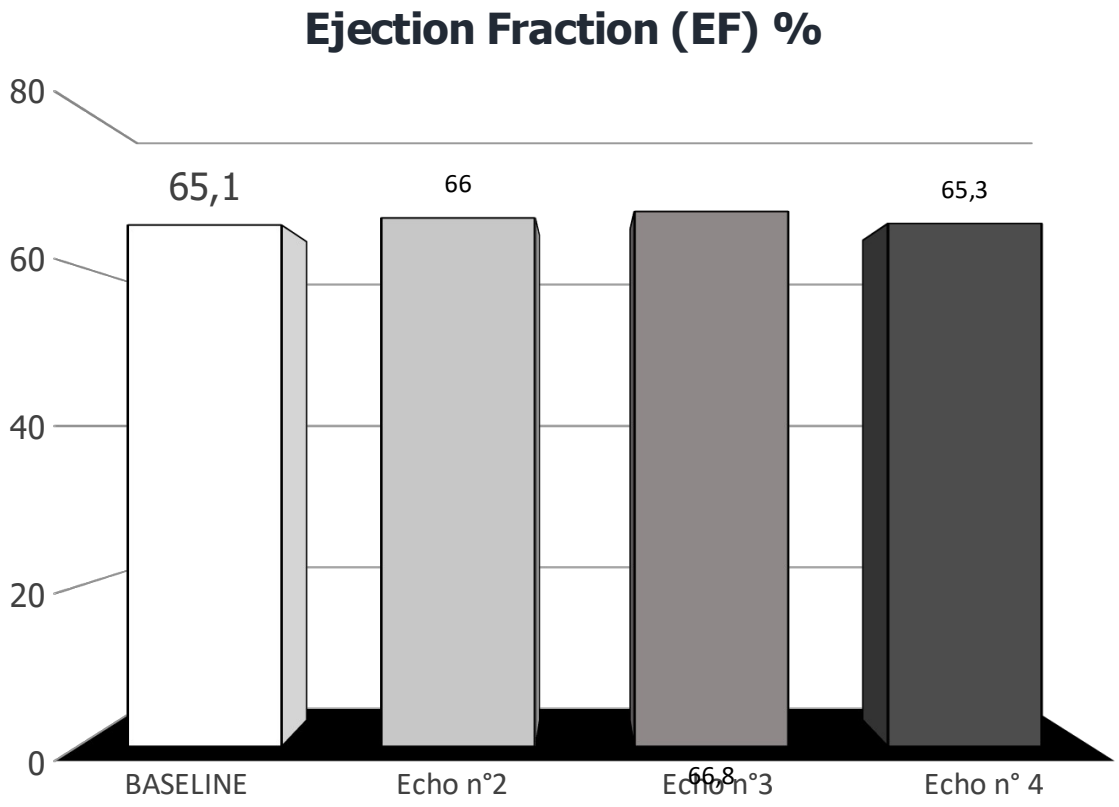
# POPULATION

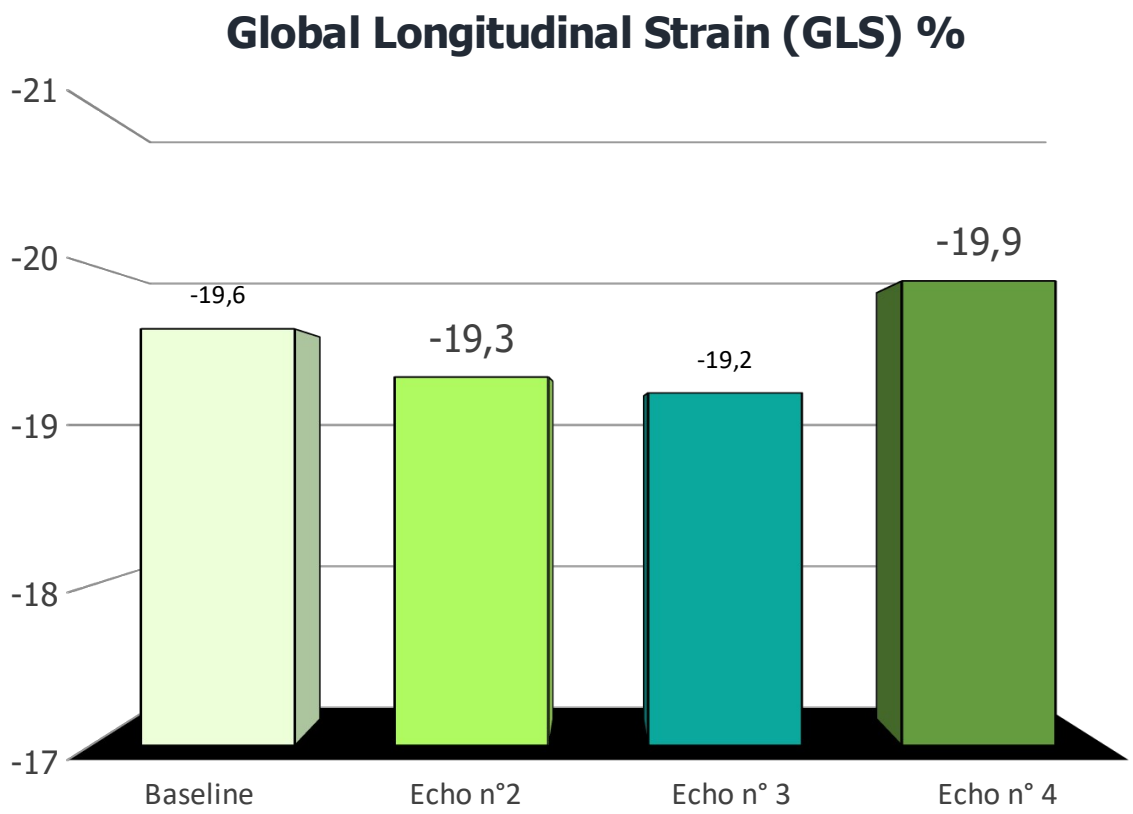
| Characteristics | Population N = 52 (%) |
|---|---|
| **Gender** | |
| Male | 16 (30,8%) |
| Female | 36 (69,2%) |
| **Median age** | 29,5 (range 19-69) |
| **PS ECOG** | |
| 0 | 47 (90,4%) |
| ≥ 1 | 5 (9,6%) |
| **Histology** | |
| HL | 36 (69,2%) |
| DLBCL | 9 (17,3%) |
| PMBCL | 7 (13,5%) |
| **Stage** | |
| I | 9 (17,3%) |
| II | 23 (44,2%) |
| III | 10 (19,2%) |
| IV | 10 (19,2%) |
| **B symptoms** | |
| Yes | 14 (26,9%) |
| No | 38 (73,1%) |
| **Mediastinal Bulky lesion** | |
| Yes | 21 (40,4%) |
| No | 31 (59,6%) |

- **Patients enrolled to date: 77**
- Observation ongoing: 13
- Drop out for clinical reasons: 7
  *(progression, relapse, second cancer)*
- Drop out for technical reasons: 5
  *(e.g. impossible to acquire GLS parameters)*
- Patients included in this analysis: **52**
  *(observation completed)*

**24** in cohort A: Chemo alone
**28** in cohort B: Chemo + ISRT

# RESULTS (systolic parameters)

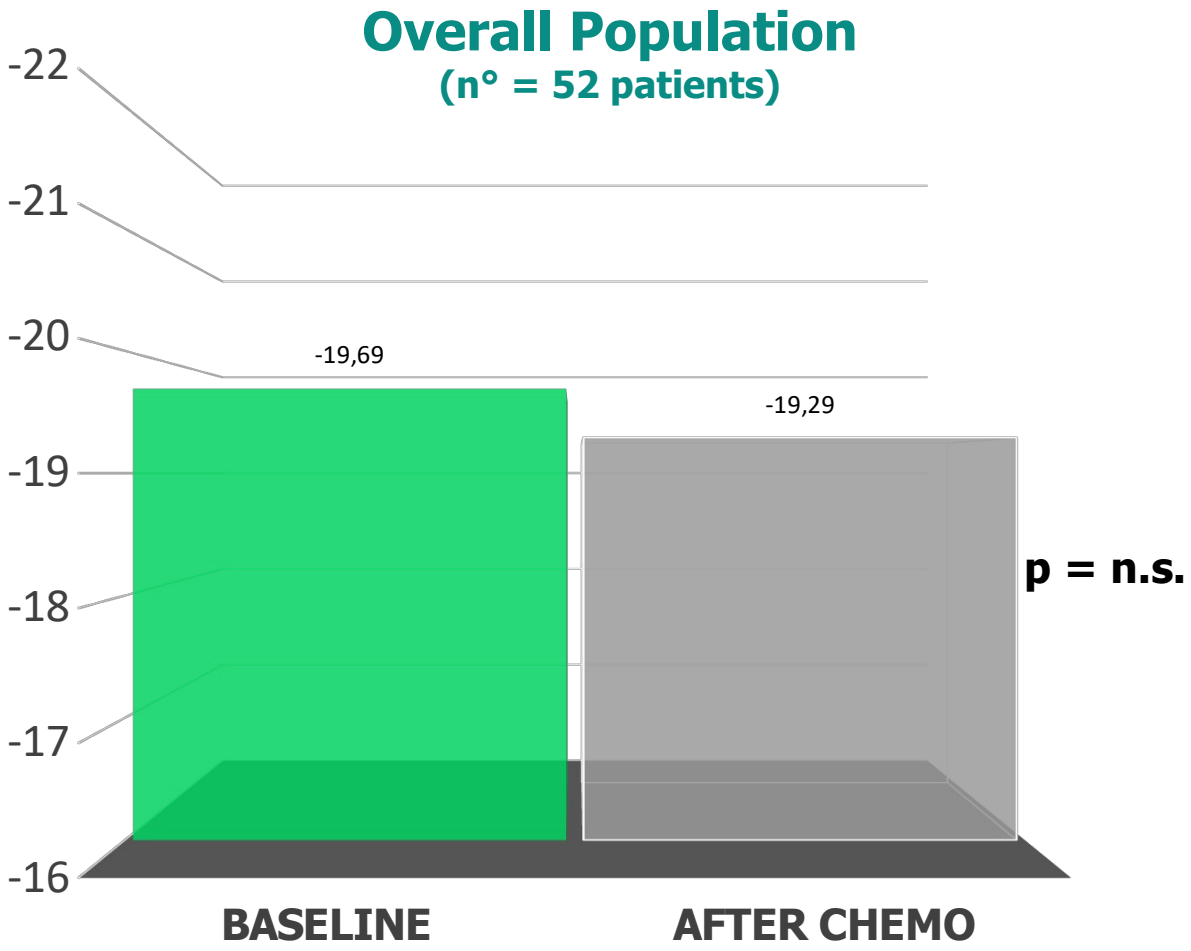


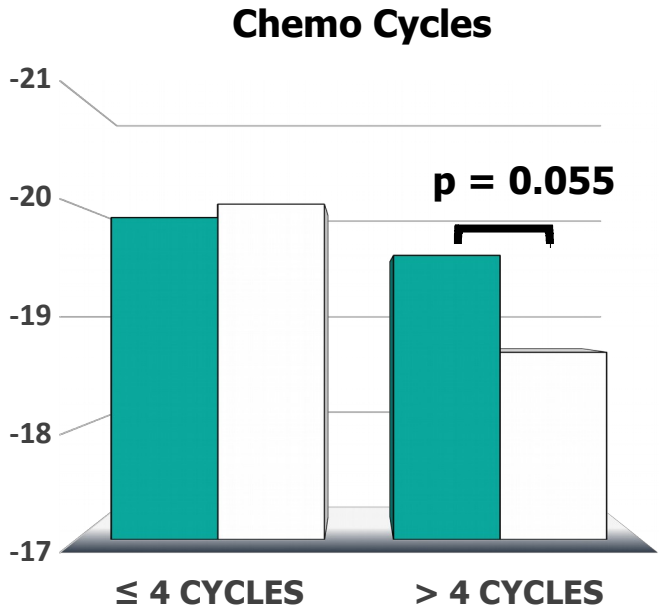
# RESULTS
## (GLS changes after chemo)

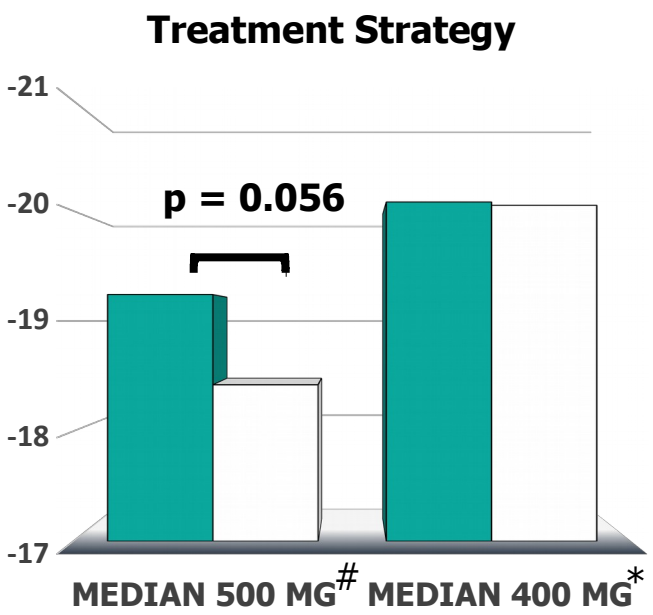
**DETAILS**

| | |
|---|---|
| ❑ **Regimen** | |
| ABVD | 36 (69,2%) |
| RCHOP | 16 (30,8%) |
| ❑ **Cycles (n)** | |
| ≤4 | 22 (42,2%) |
| 6 | 30 (57,8%) |
| ❑ **Anthracyclines cumulative dose (mg)** | |
| mean | 419,72 ±114,90 |
| median | 463,00 |
| min | 135,00 |
| max | 600,00 |



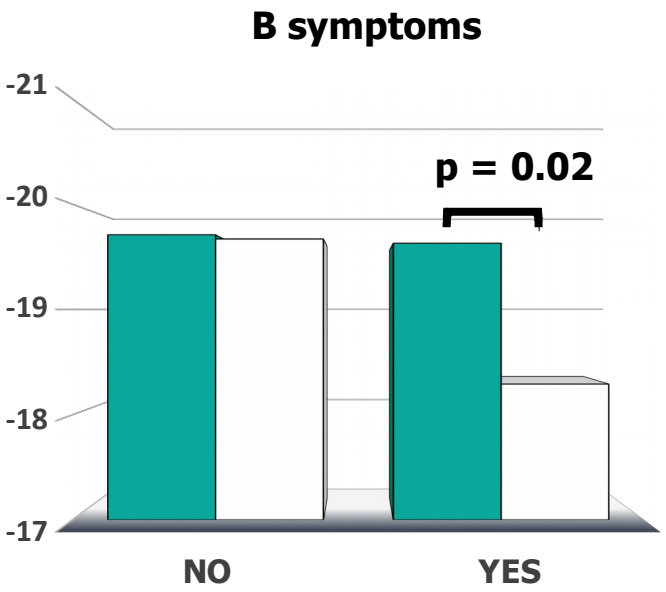
# RESULTS
## (GLS changes after chemo)
## Subgroup analysis

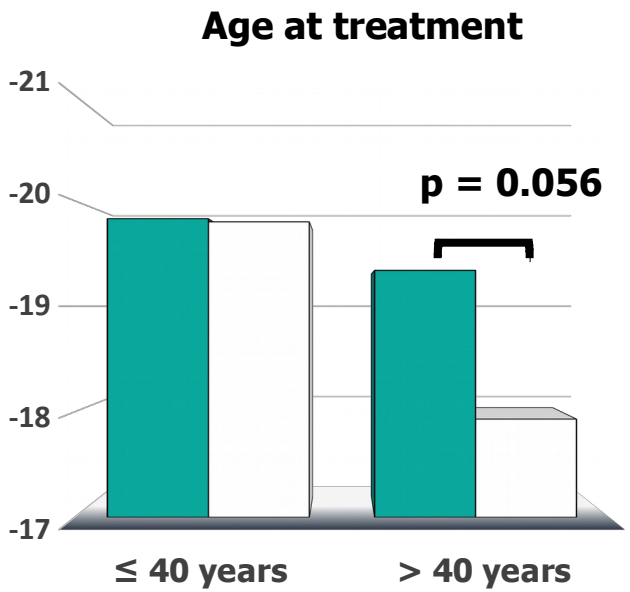


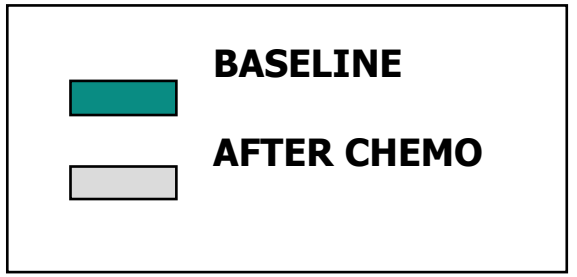




# median anthracycline dose: 500 mg

* median anthracycline dose: 400 mg

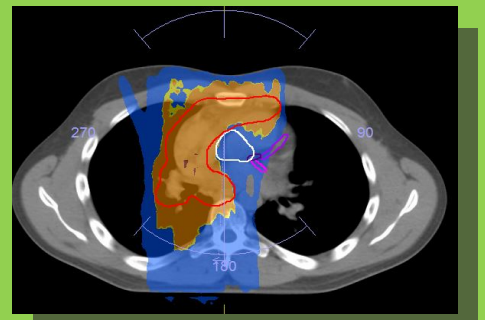


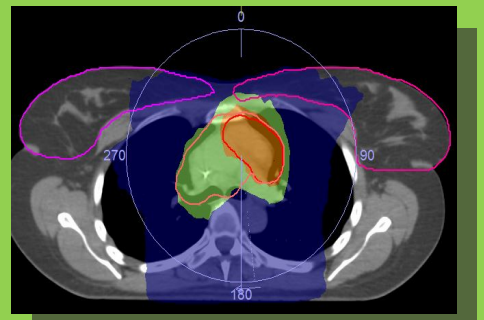



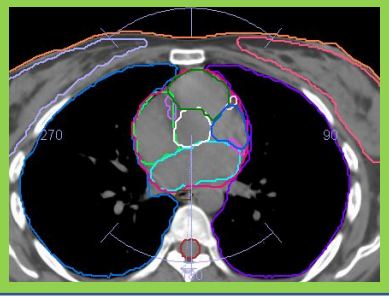
## DETAILS

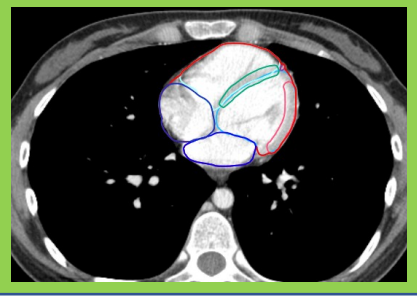
- CTV contoured according with ILROG guidelines (ISRT concept)
- RT technique IMRT/VMAT with comparative planning between different multi-arc approaches



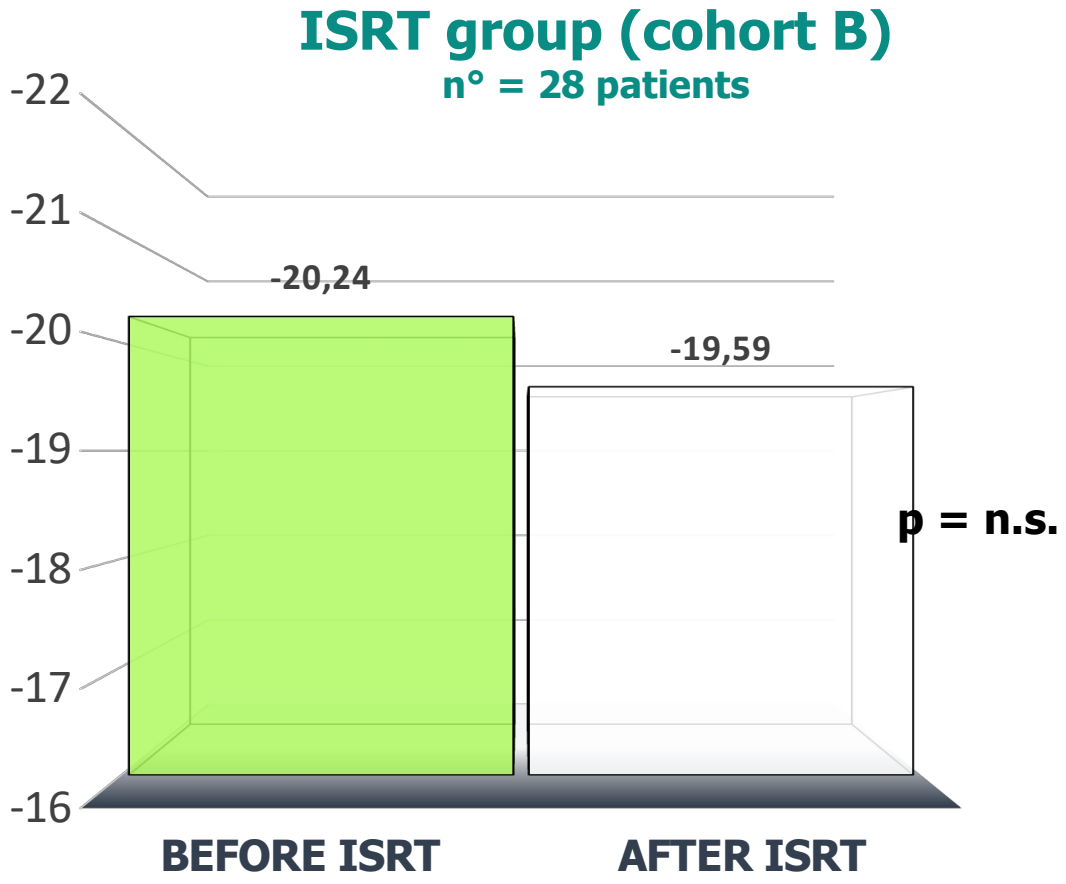




- Detailed contouring of all cardiac structures:
  1. **Coronary arteries** (LM, LAD, CX, RCA)
  2. **Valves** (aortic, pulmonary, mitral, tricuspid)
  3. **Chambers** (atria, ventricles, interventricular septum and lateral wall of the left ventricle)



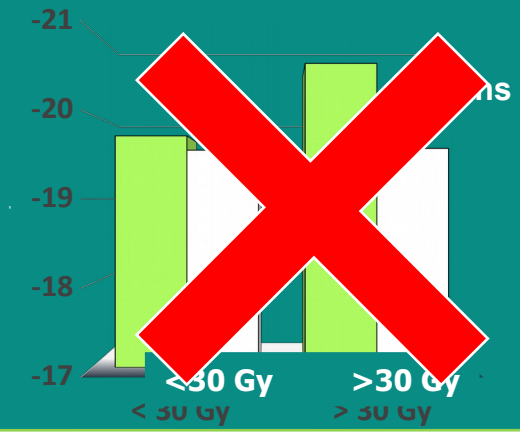
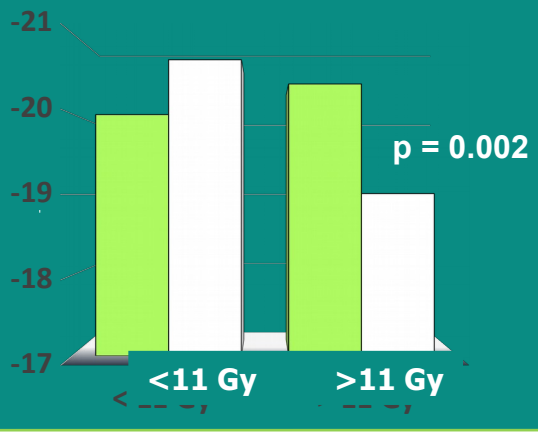
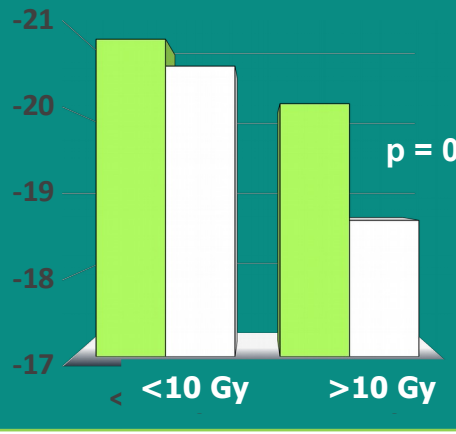
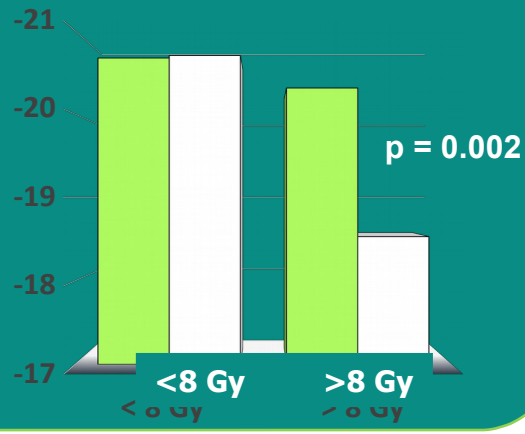
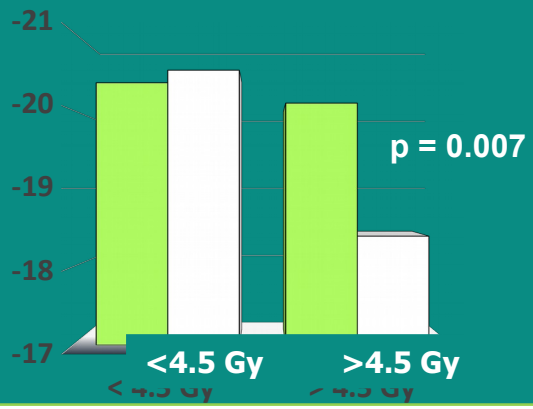
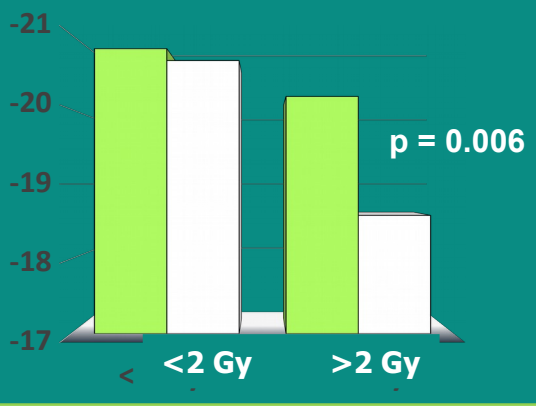
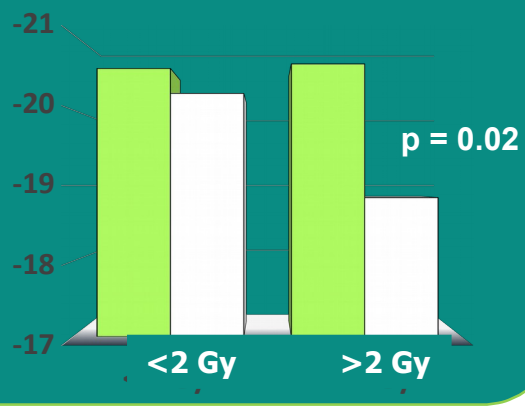
# RESULTS
## (GLS changes after ISRT)



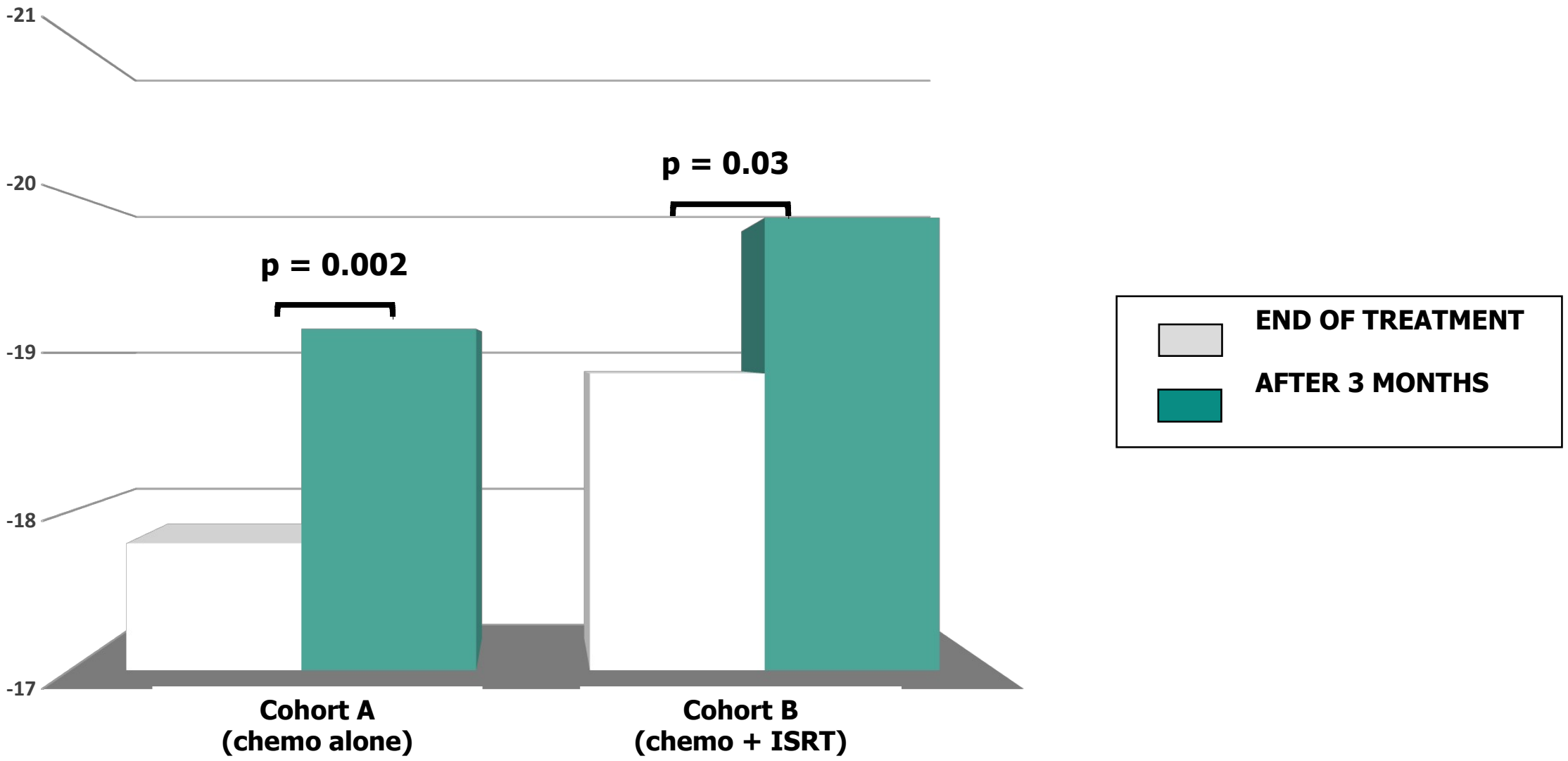
# RESULTS
## (GLS changes after ISRT) Subgroup analysis

BEFORE ISRT

AFTER ISRT

| | Whole Heart | Left Ventricle | Interventricular Septum | Lateral Wall |
|---|---|---|---|---|
| Max Dose |  |  |  |  |
| Mean Dose |  |  |  |  |

# RESULTS
## (GLS recovery 3 months after end of treatment)



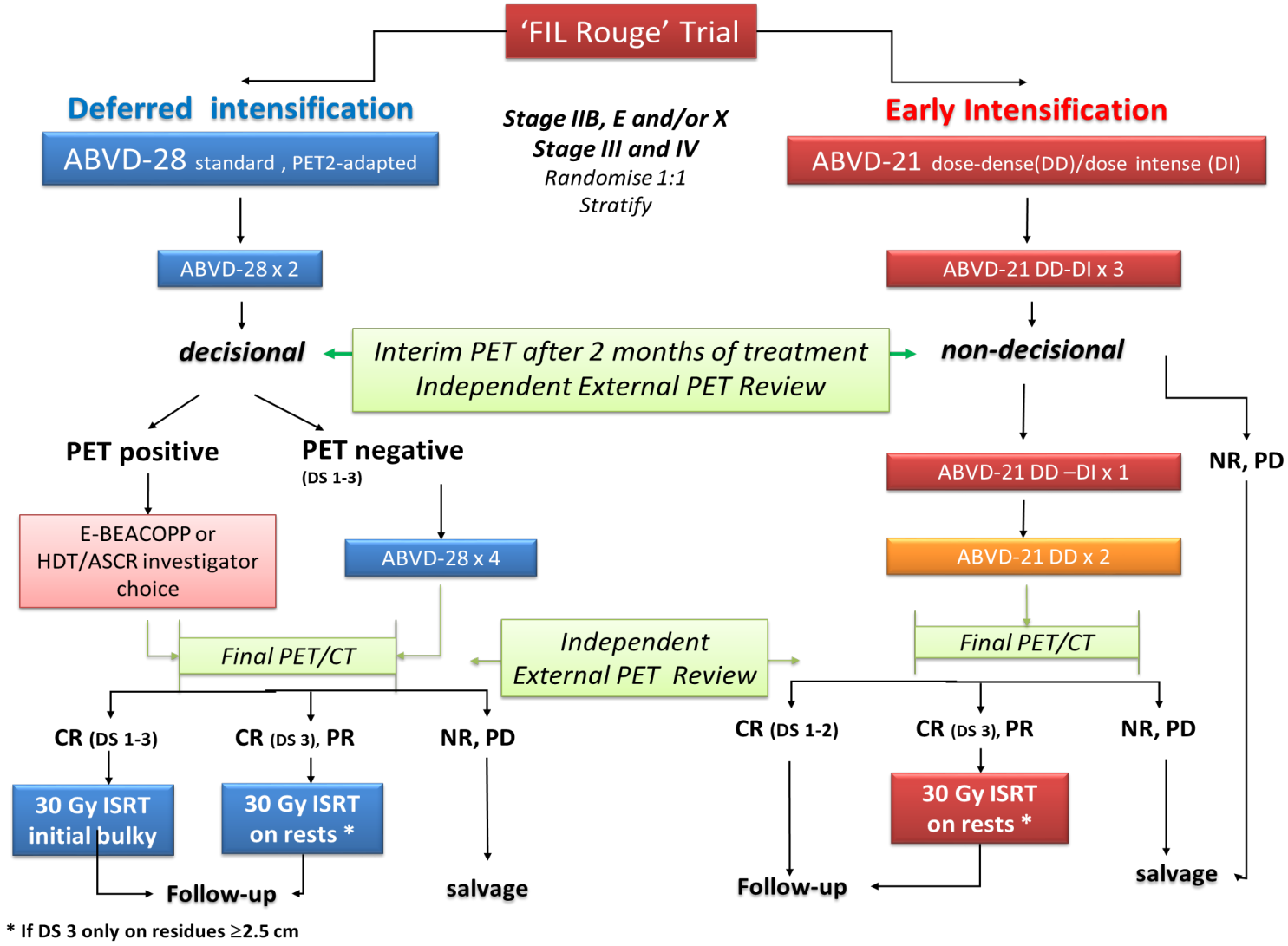
# CONCLUSIONS

- **GLS seems a promising** tool to detect **early** chemo and radiation induced **cardiotoxicity** in lymphoma patients.

- Preliminary results suggest a **correlation** of both **anthracyclines and radiation dose** with preclinical heart damage.

- The **completion of CARDIOCARE** study, and a **future correlation with clinical events** are needed to support and strengthen these preliminary assumptions.

# Frontline Advanced HD




Baseline STRAIN-Echo

Post CT STRAIN-Echo

Post RT STRAIN-Echo

Baseline STRAIN-Echo

Post CT STRAIN-Echo

Post RT STRAIN-Echo

Follow up STRAIN-Echo

# AKNOWLEDGMENTS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