

Breast cancer radiotherapy

PATIENT'S GUIDE



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Updated 2024

Outlines

What is radiotherapy

Schedule

Evidence

- Breast conservation surgery
- Mastectomy
- Regional nodes

Toxicities

Types of radiotherapy

Types of breast radiotherapy offered in SAM

3D/IMRT

Partial breast (for very low risk tumours)

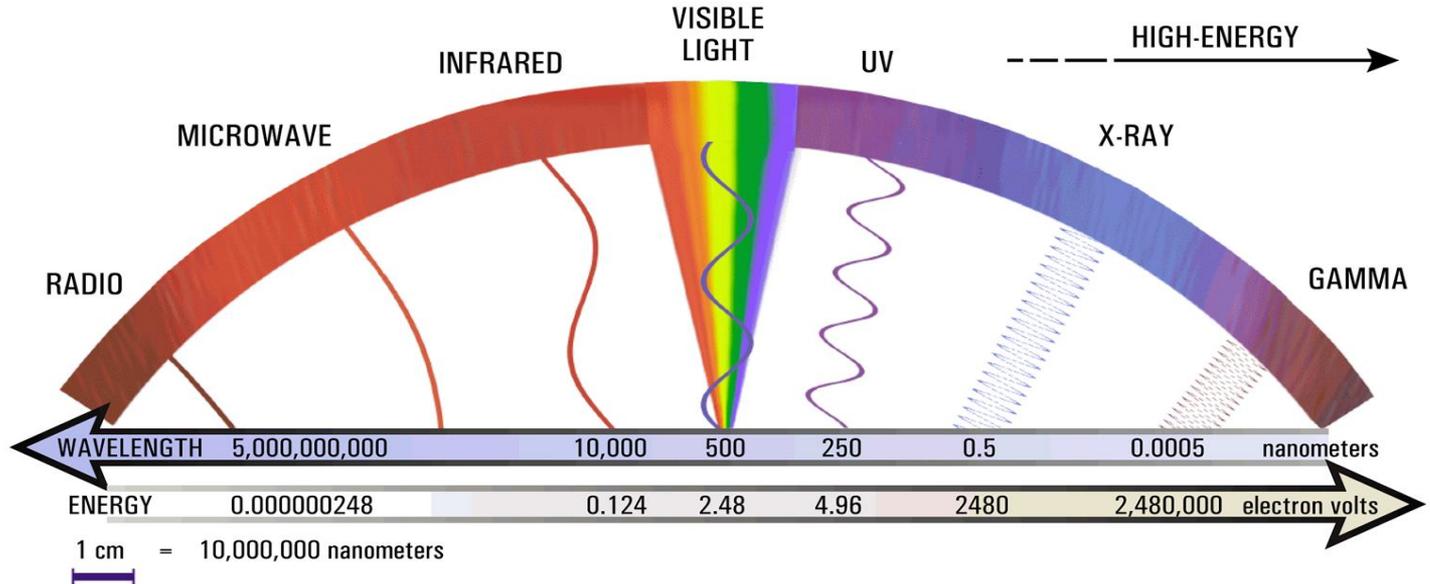
VMAT

- Breath-holding/gating
- Tattoo-less, temporary tattoos

What is radiotherapy?

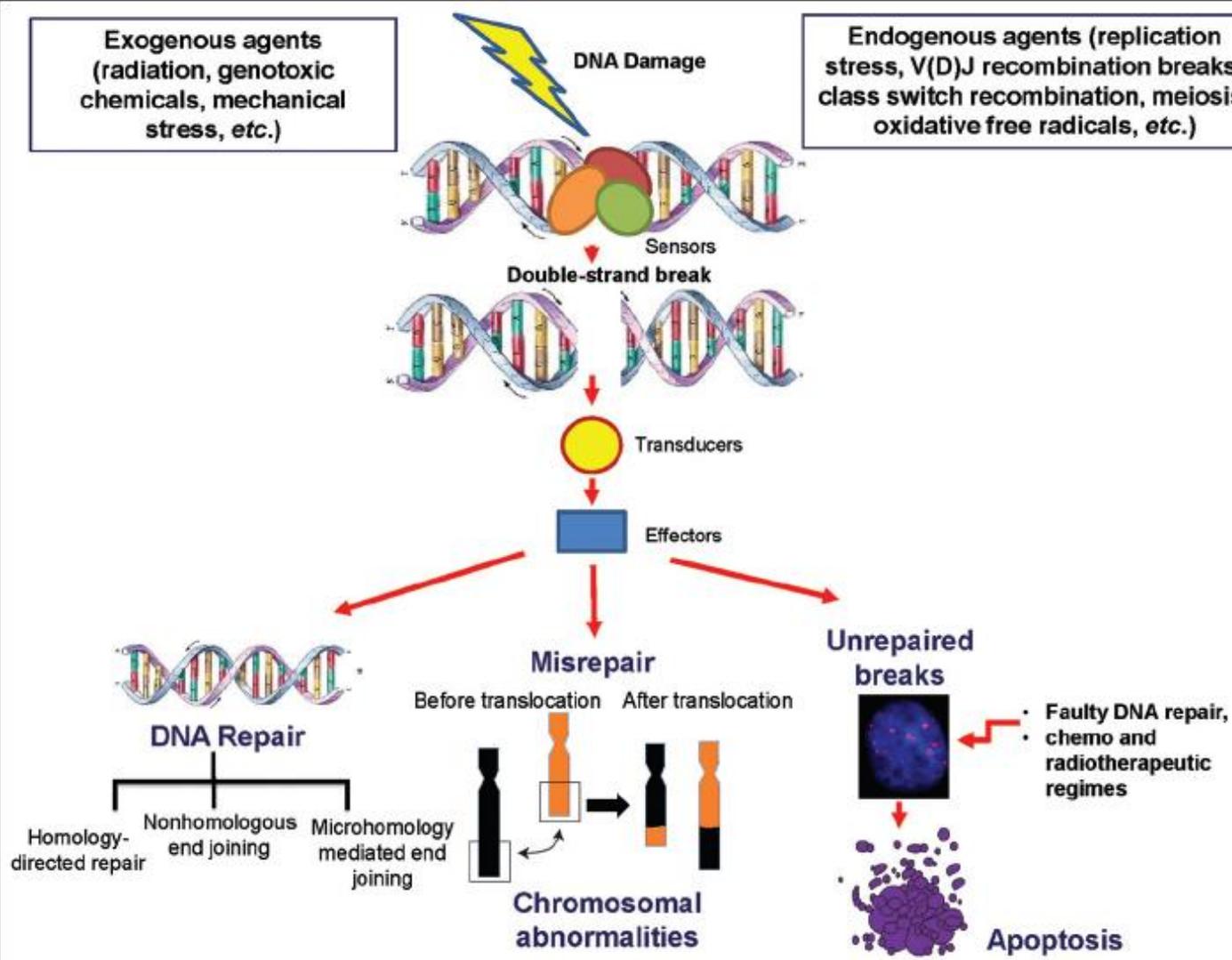
High energy x-ray

DNA damage



Exogenous agents
(radiation, genotoxic
chemicals, mechanical
stress, etc.)

Endogenous agents (replication
stress, V(D)J recombination breaks,
class switch recombination, meiosis,
oxidative free radicals, etc.)



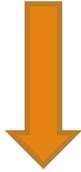
Schedule

Consultation

CT simulation

Planning

Treatment starts



1 week

1st week | 2nd week | 3rd week | 4th week*boost optional for higher risk

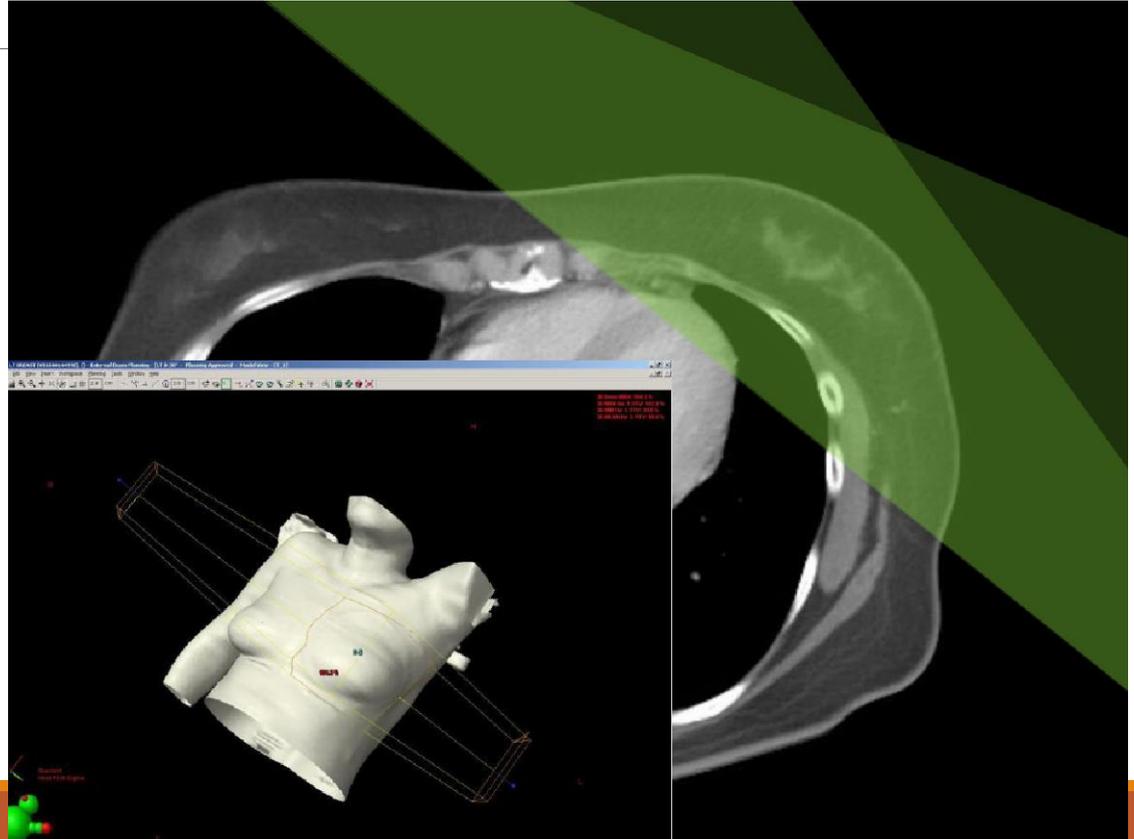
Daily 15x

Daily 5x (low risk breast cancer)

CT simulation



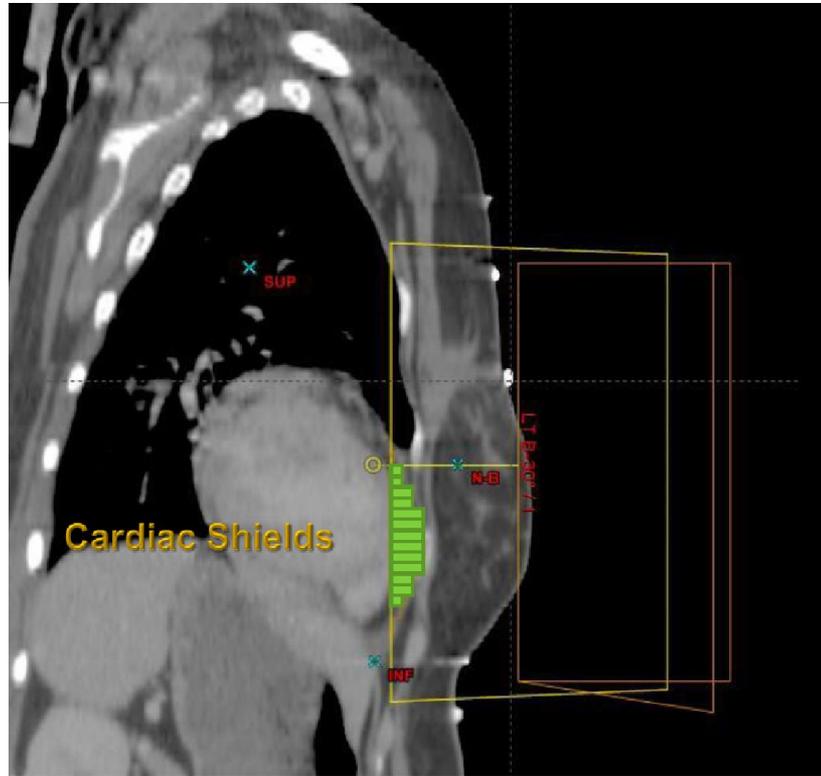
Radiotherapy planning



Radiotherapy delivery

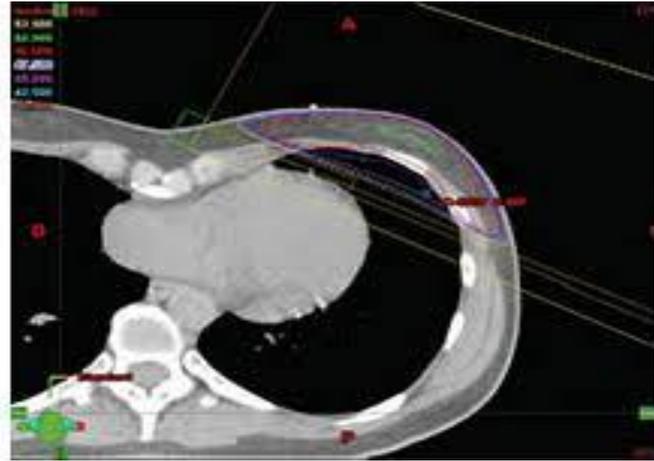


Cardiac shield



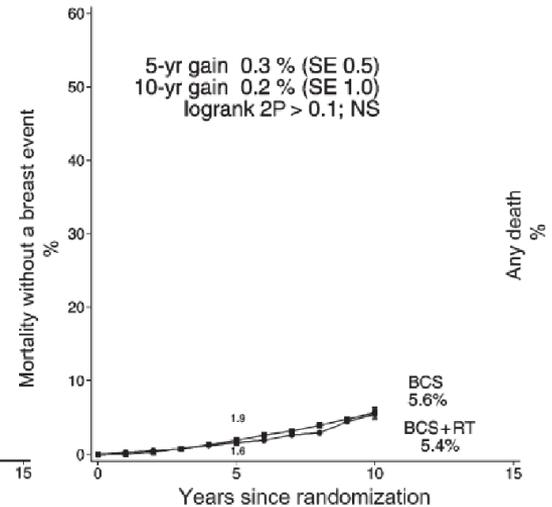
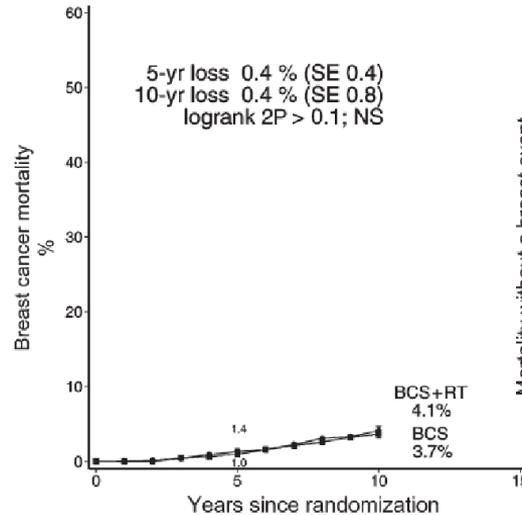
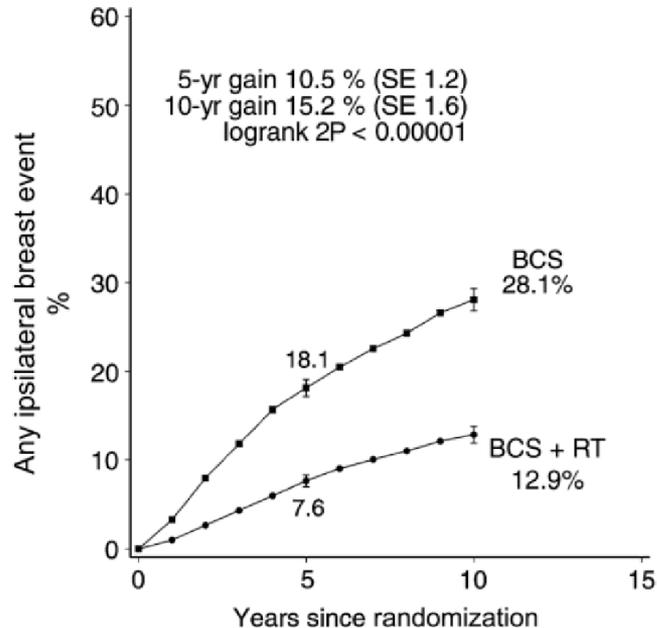
Breath hold

- SDX
 - Left sided tumours
 - Younger patients
 - Existing heart condition



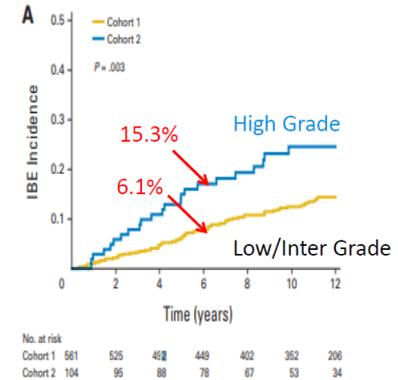
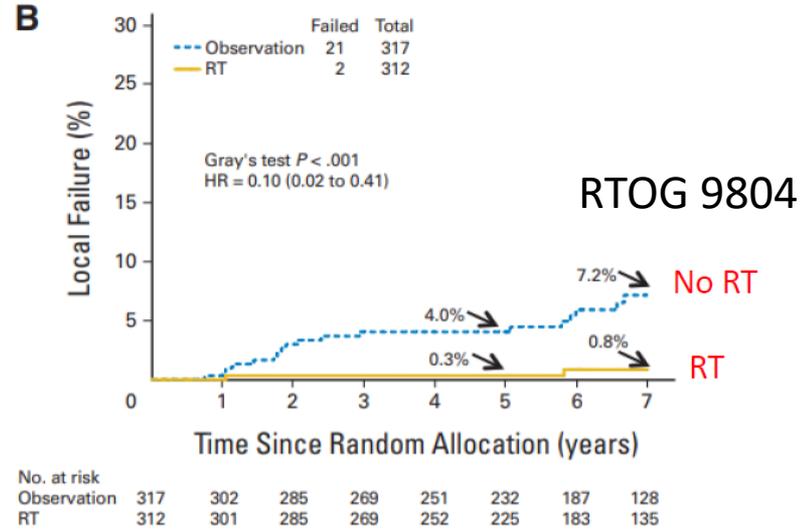
Evidence

- Non-invasive (DCIS)



DCIS

- Low risk DCIS may not need radiotherapy
 - Nomograms (risk calculators)
 - Tissue gene test
 - Take tamoxifen

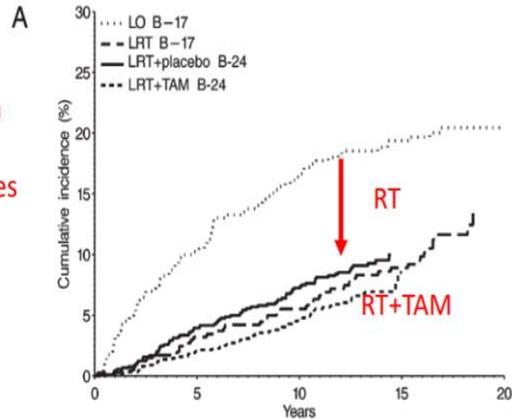


ECOG 5194

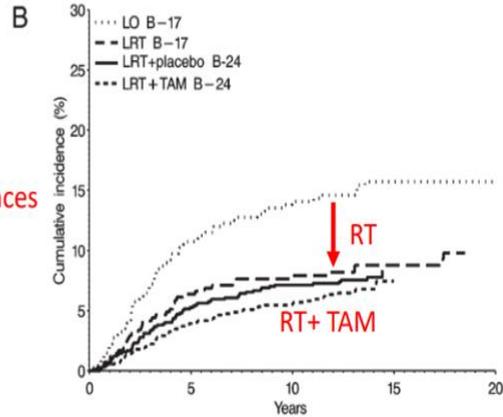
DCIS Radiotherapy + Tamoxifen

NSABP B-17 and NSABP B-24

Invasive in
breast
recurrences

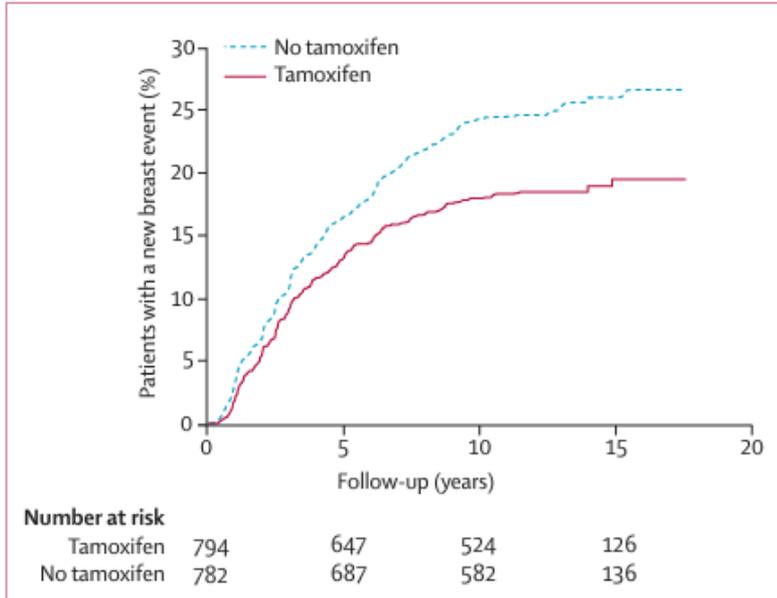


DCIS in
breast
recurrences



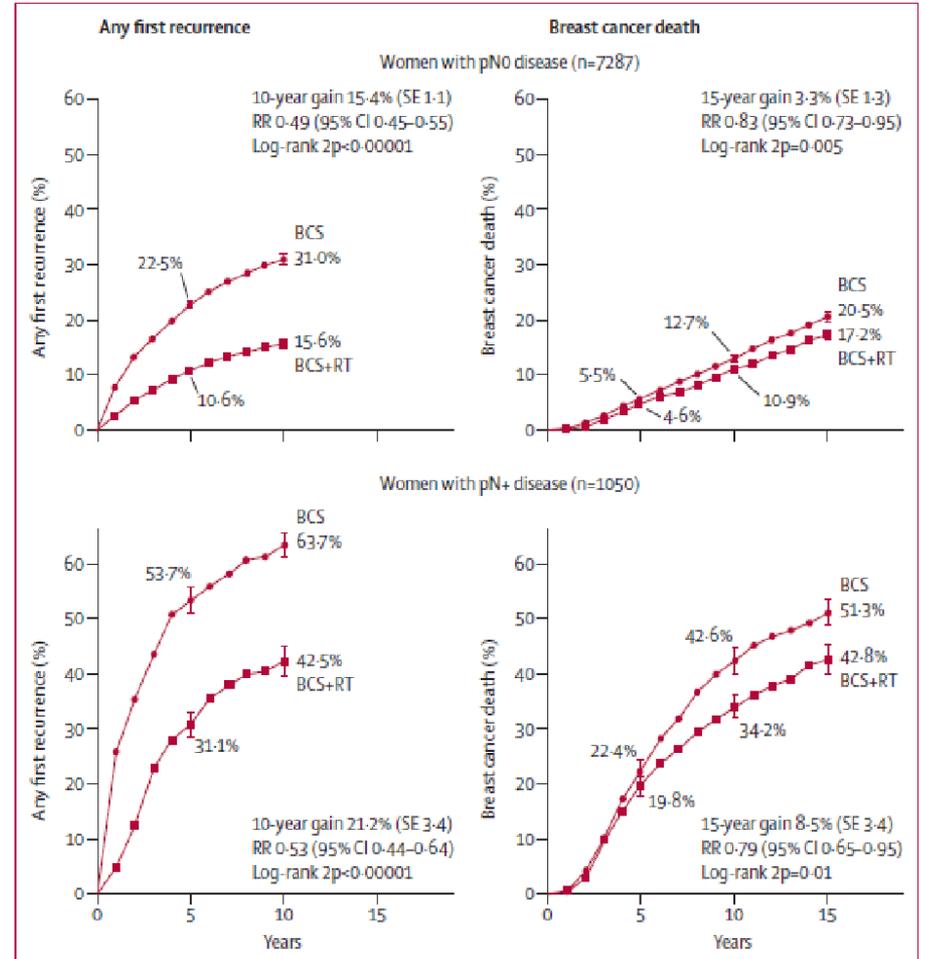
DCIS endocrine role

- Tamoxifen reduced ipsilateral and contralateral events



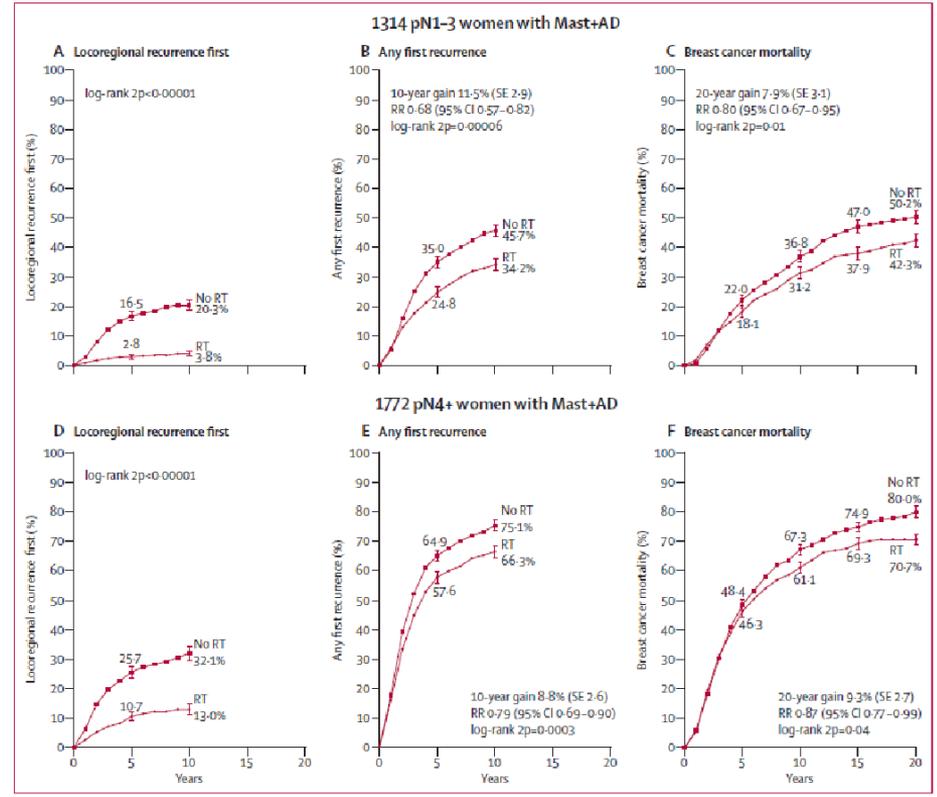
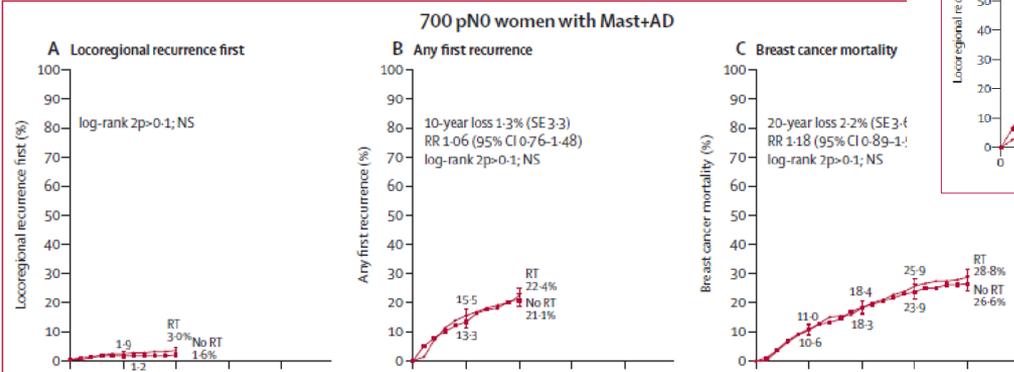
Evidence

- Invasive cancer
- Breast conserving surgery



Evidence

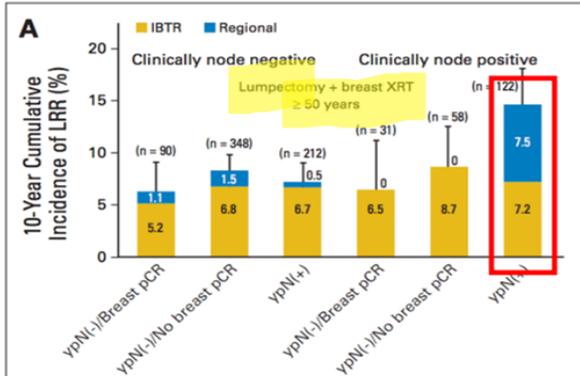
- Invasive cancer
- After mastectomy



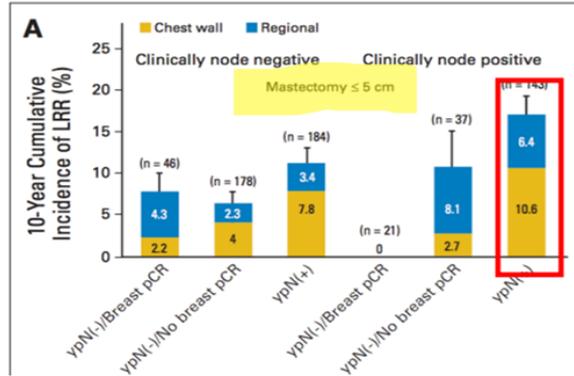
n=8k, EBCTCG MA

after neoadjuvant chemo

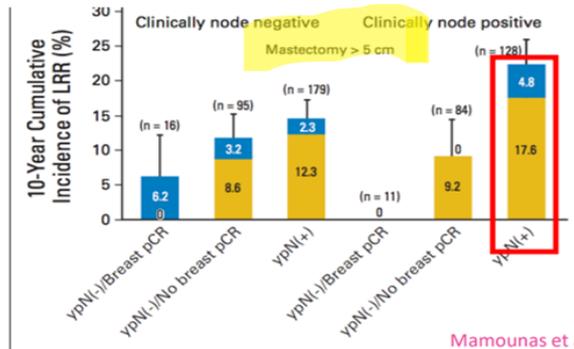
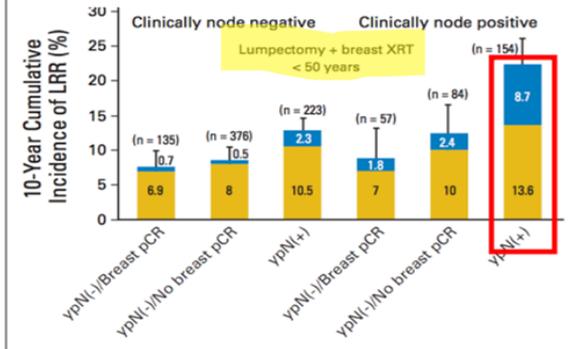
Lumpectomy



Mastectomy



In cN1 patients who remain ypN+, 10-year LRR is 14-22%



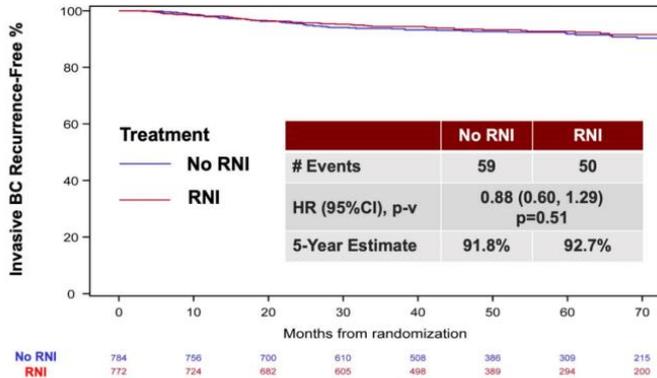
cN+ >> ypN1 needs RT

cN+ >> breast pCR +/-

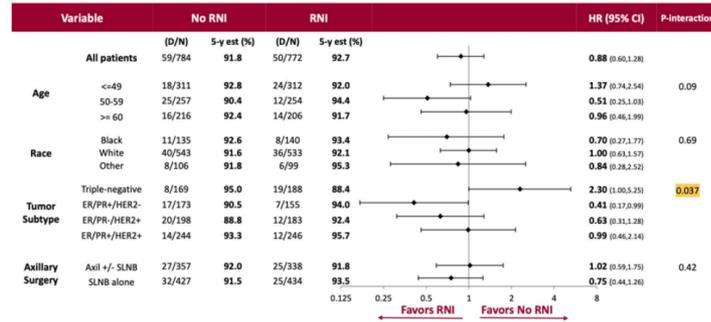
Pathological complete response after chemo

NSABP B-51

Isolated Loco-Regional Recurrence-Free Interval (ILRRFI)



IBCRFI – Exploratory Subgroup Analysis



Mamounas, SABCs Presentation, 2023

Especially good news for triple negative patients
Who achieve complete response

Side effects

- Short term
 - - skin redness
 - - fatigue
 - - mild cough

Week 4



Side effects

- Long term
 - Breast stiffness
 - Telangiectasia
 - Shrinkage
 - Hyperpigmentation
 - Lymphedema
 - Heart damage
 - Secondary cancer

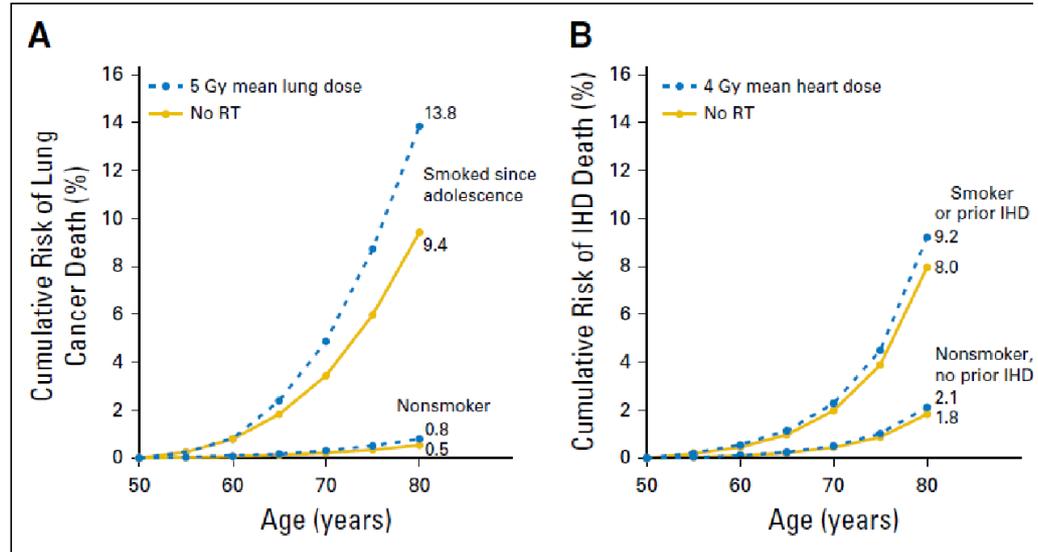
5.5 years later



Heart and lung side effects

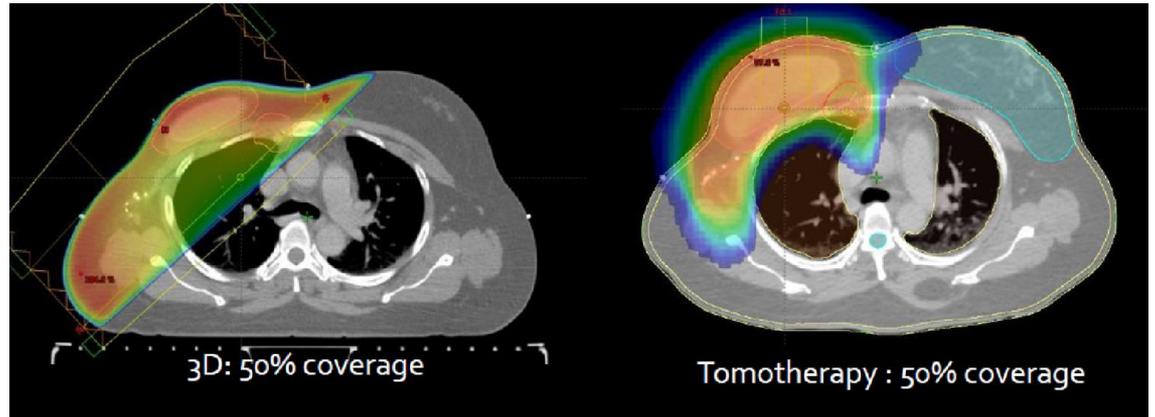
Non-smoker

- Lung cancer
- Absolute increase 0.3%
- Death from heart problem
- Absolute increase 0.3%



Regional nodal irradiation

- For patients with nodal involvement
 - Internal mammary nodes
 - Supraclavicular nodes
 - Lower axillary nodes



Low risk breast cancer

- No adjuvant radiotherapy treatment
 - Partial breast 5# (1 week)
 - 3D
 - VMAT
-
- Definition of low risk differs
 - 40-50, >50
 - Small size, low grade, no lymphovascular invasion, clear margins

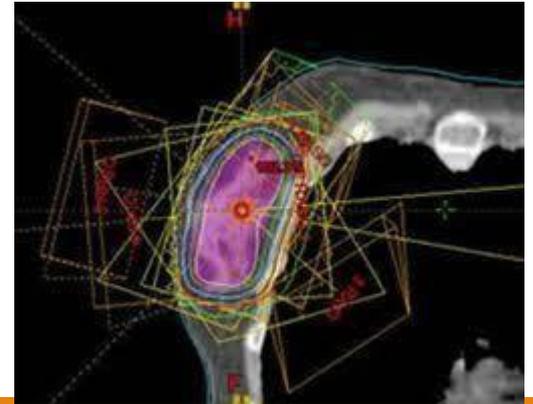
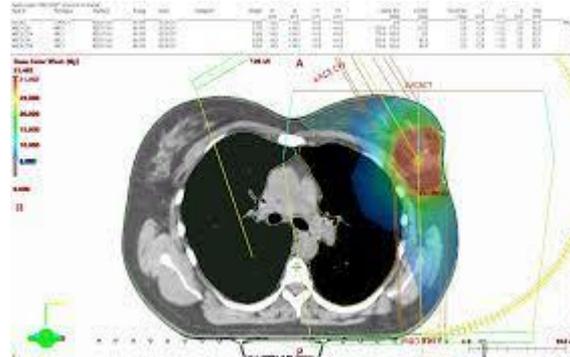
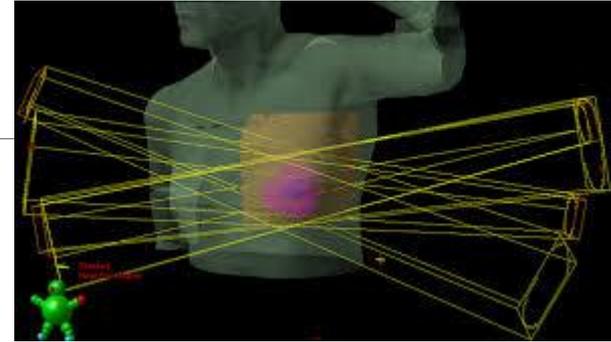
Partial breast radiotherapy

Florence trial showed excellent cosmetic outcomes and tumour control

5# daily

Suitable for low risk breast cancers

(ER+, low grade, Node-, small tumour)



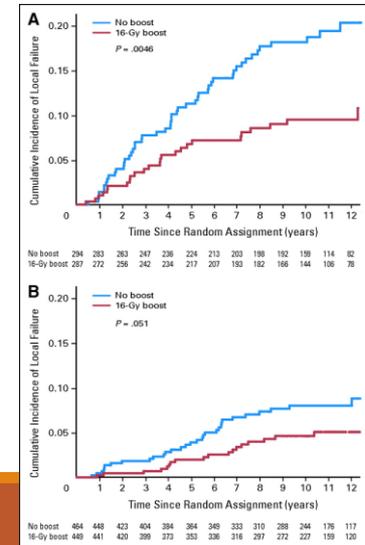
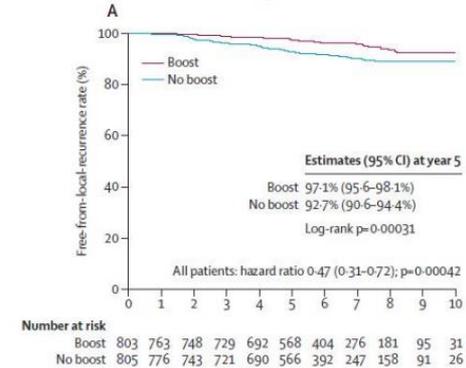
Boost

- Cancer
 - Younger patients, high grade, close margins

- DCIS
 - Younger patients, high grade, large

- Simultaneously or sequentially (10-13.35 Gy in 5 fractions)
- Drawbacks > Double fibrosis rates, worse cosmesis

BIG 3-07/TROG 07.01



Care during breast radiotherapy

- Diet: eat healthily in moderation
- May experience mild sore throat if receiving nodal irradiation
- Exercise: light-moderate exercise during, normal lifestyle after
- Avoid anti-oxidant supplements
- Apply only emollients and mild topical steroids as prescribed
- Bath with water without soap, dab dry

Follow up

- 4 -6 monthly for first few years
 - Alternate with surgeon, chemo-oncologist, radiation oncologist
- Mammogram yearly
- +/- endocrine therapy
- +/- bone modifying therapy
- +/- targeted therapy

Resources

- Singapore breast cancer support group
- Macmillan breast cancer patient information
 - Macmillan cancer support
 - Macmillan.org.uk

Prognosis

- AJCC stage + risk score
 - 1 point each for
 - ER –
 - HER 2 –
 - Grade 3
- Predict nomogram
 - Breast.predict.nhs.uk

Questions

- Ruxin.wong@proton.sg
- Updated 2023