Equity and research in oncology

The subtle balance between personalized medicine and accessibility to care

New surgical indications

Pushing boundaries to improve outcome

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Maastricht University

The Netherlands

Maastricht UMC+

Maastricht UMC+

No disclosures

Foundations Surgical Oncology

- Anatomy
- Biology of cancer
- Surgical technique
- Human physiology

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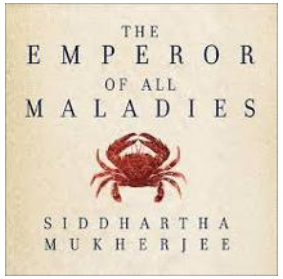
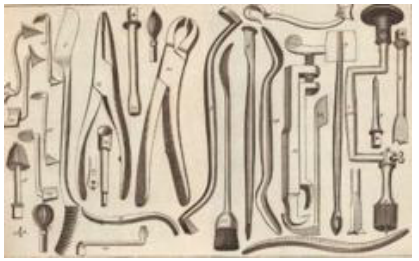
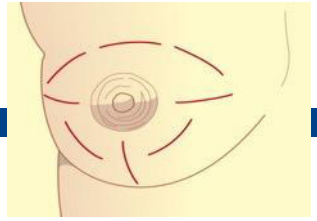


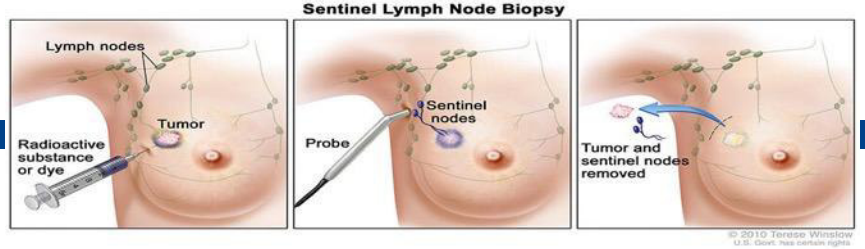
Brief history Surgical Oncology



- Ancient times: local excision
- 19th century: radical surgery
  - primary tumour and lymph nodes
- 20th-21th century: preservation organ/function

  Breast, sarcoma, anal cancer, oesophagus, head & neck, rectal cancer,..

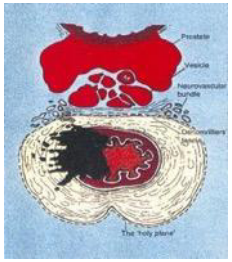


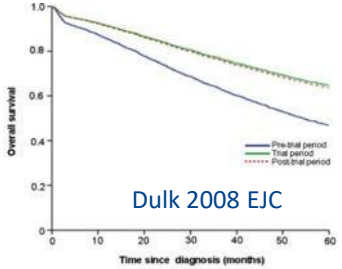


oncological outcome
functional outcome
morbidity

Rectal cancer treatment

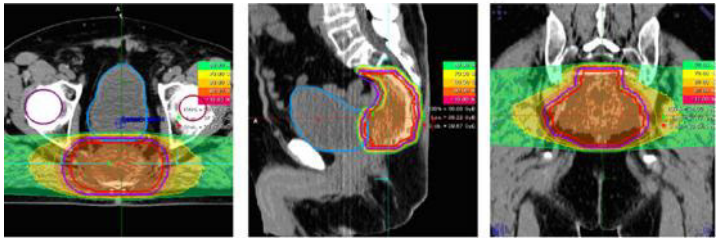
- Surgery: total mesorectal excision



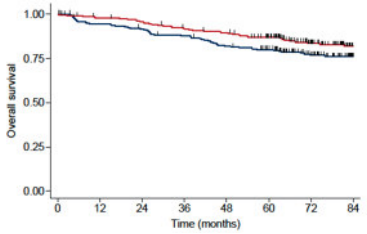


Dulk 2008 EJC

- Neoadjuvant radiotherapy



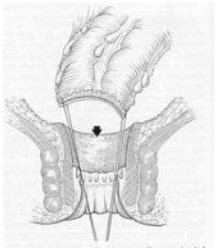
- Neoadjuvant chemotherapy



Conroy 2024 Ann Onc

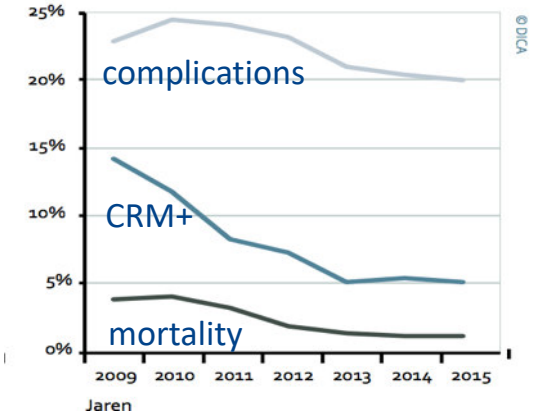
Improved outcome?

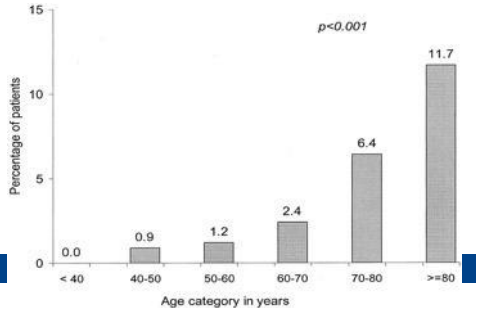
- Postop morbidity – mortality
- Anorectal/urogenital function ↓
- Body image
- Treatment goals
  - cure
  - remaining active
- Frail – elderly: remaining independent



Operative treatment has become safer

- Minimally invasive techniques
- Prehabilitation
- Improved perioperative care
- Frailty screening
- Geriatric co-management

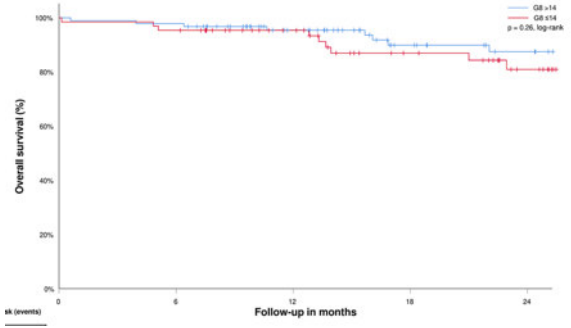




Marijnen et al. JCO 2002

	2011-2012		2015-2016
• Overall	2.3%	→	1%
• >80 asa1-2	5.1%	→	2.8%
• >80 asa3-4	6.4%	→	4.3%

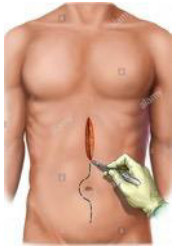
de Neree tot Babberich 2018 EJSO

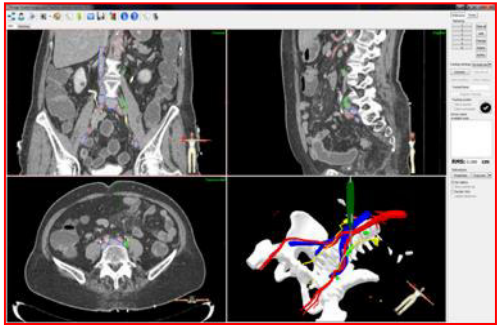


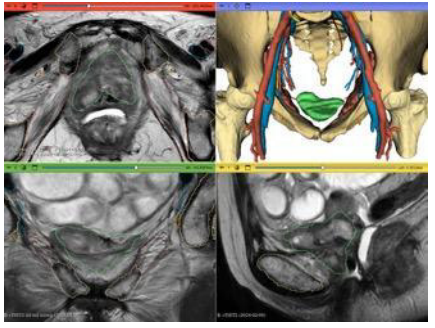
Ketelaers 2023 J Geriatric Onc

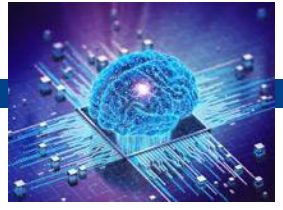
Technical progress

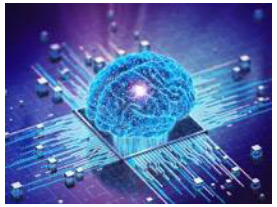
- Surgical technique
  - Minimal invasive
  - New approaches
  - Energy devices
- Surgical Imaging
  - Navigation
  - Localisation
  - Optical imaging
- Artificial Intelligence





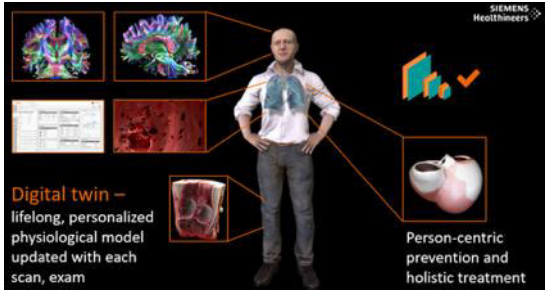


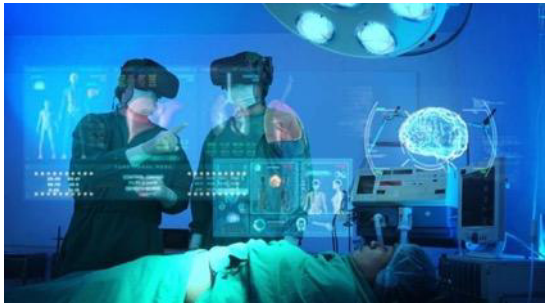




More on AI

- Multimodal diagnosis
- Multimodality treatment
  - Digital twin
  - Predicting outcome: survival, complications, QoL
  - MDT??
- Preoperative planning and precision surgery
- Intra-operative guidance
- Postoperative care
- Patient interaction – information – preparation
- Virtual research



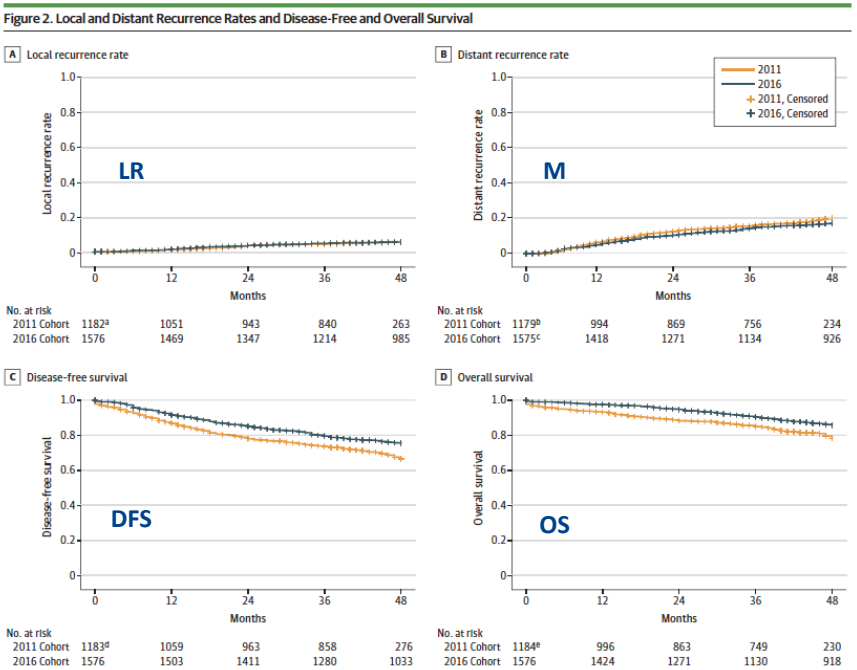


oncological outcome
functional outcome
morbidity

Do we need RT when we have good surgery?

- Dutch cohort 2011 vs 2021
- cT1-3N0-1M0, CRM-
- Guideline: more restrictive RT

- 87% → 37% neoadj RT
- Similar oncological outcome
- Better functional outcome?



Hazen, 2024, JAMA Oncol

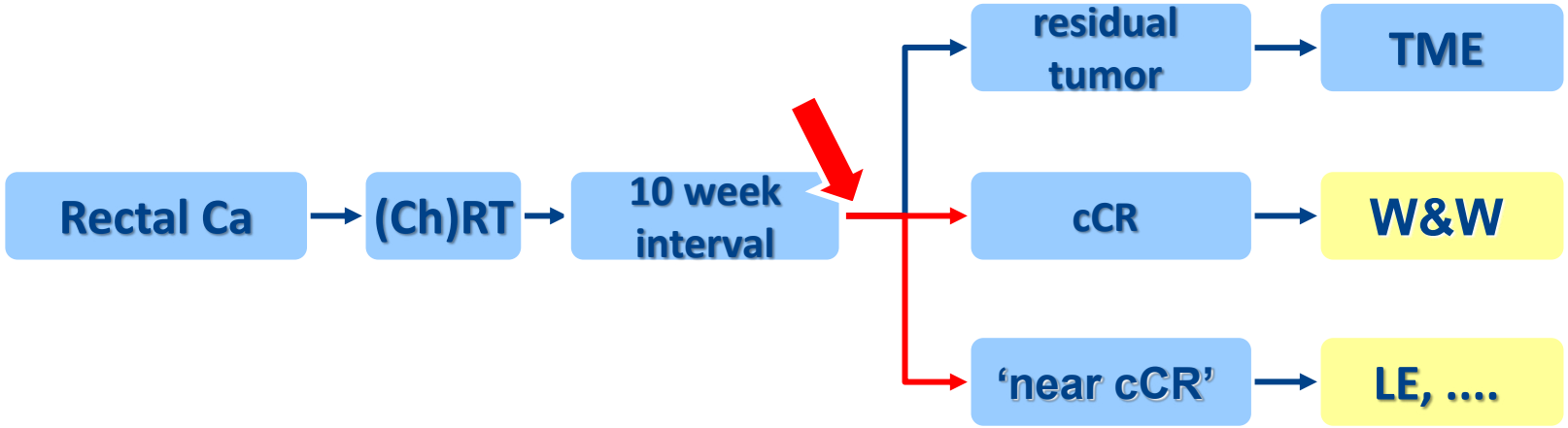
Do we need surgery when we have good RT?
Watch & Wait

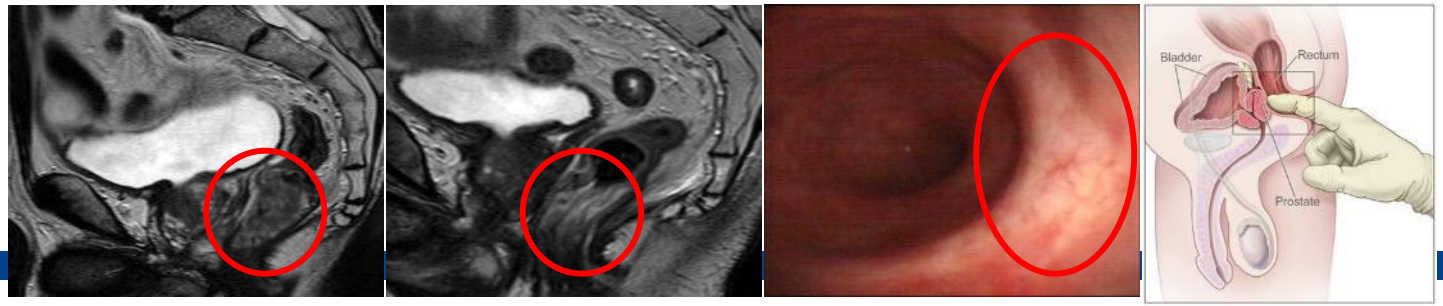
Large tumors

- ‘standard RTx’
- oncological indication
- **secondary** organ preserv.
- Watch & Wait

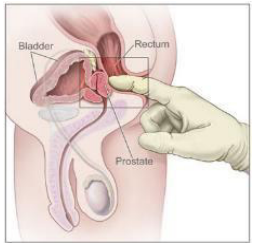
10-25%

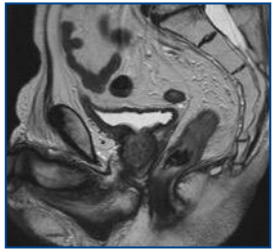
Secondary organ preservation





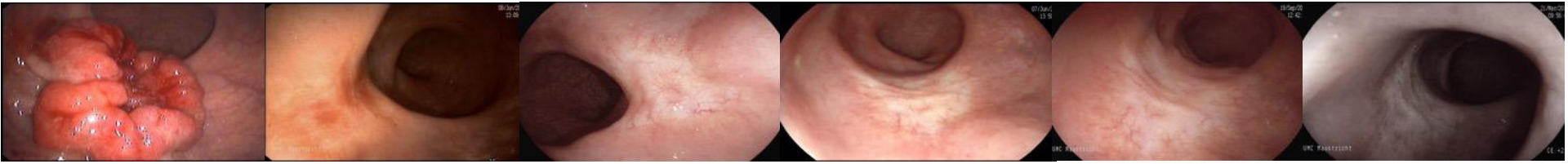
Watch & Wait: follow-up

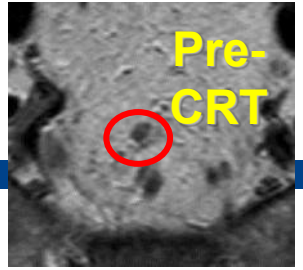


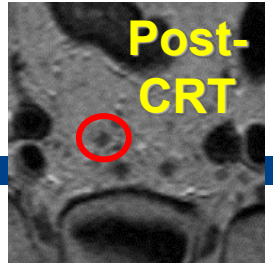


Year 1	Year 2	Year 3	Year 4	Year 5
4x MRI	2x MRI	1x MRI	1x MRI	1x MRI
4x Endoscopy	4x Endoscopy	2x Endoscopy	1x Endoscopy	1x Endoscopy

Pre CRT | 2 mths | 9 mths | 14 mths | 17 mths | 23 mths

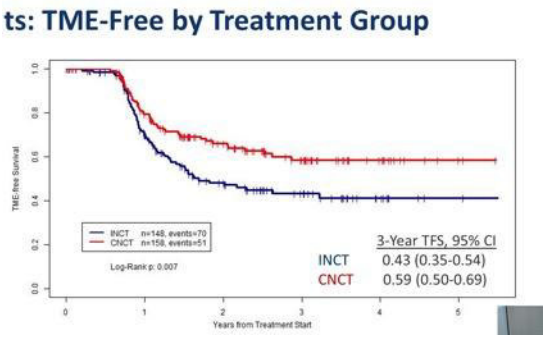






TME in organ preservation era

- OPRA-TNT (US): intermediate tumours
  - ChRT + 5FU/oxali vs 5FU/oxali + ChRT
  - 3yr organ preservation: 58%vs 43%

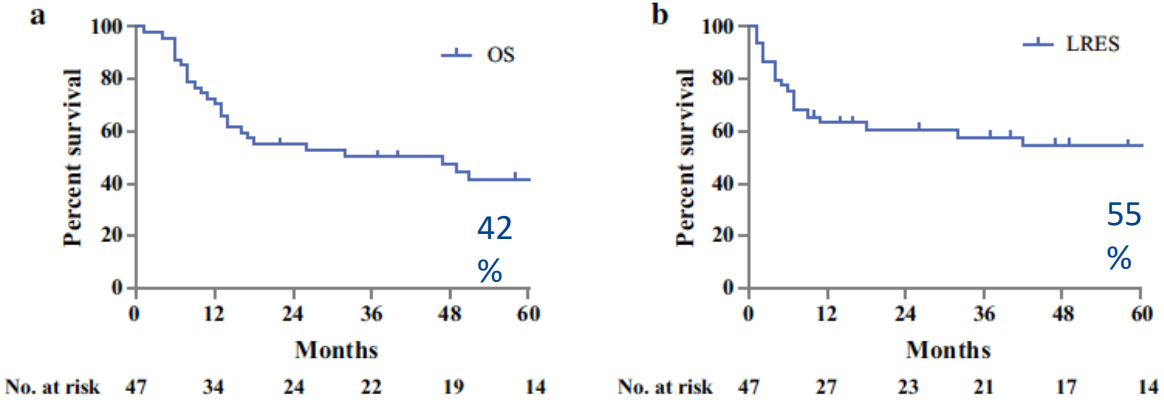


- Outcome after TME
  - 90% R0!!
  - Local recurrence 12%
  - Distal recurrence 24%
  - Combined recurrence 7%

Garcia Aguilar, 2022, JCO

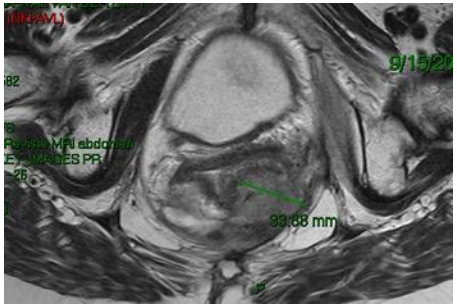
Anal cancer: outcome of salvage surgery

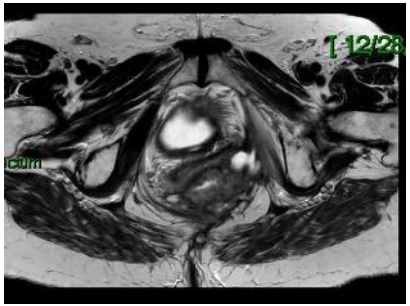
- 30 yr period Erasmus Rotterdam UMC – NL: 47 patients
- R0 resection 81%
- Mortality 0%, major morbidity 30%, perineal wound problems 32%

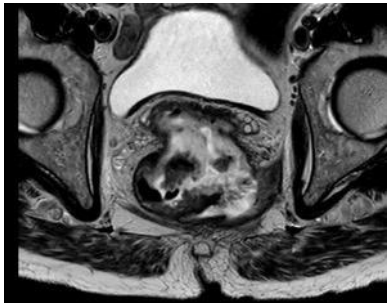


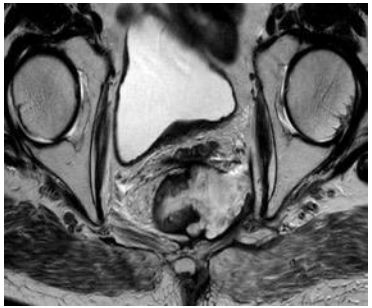
Hagemans 2018 Ann Surg Onc

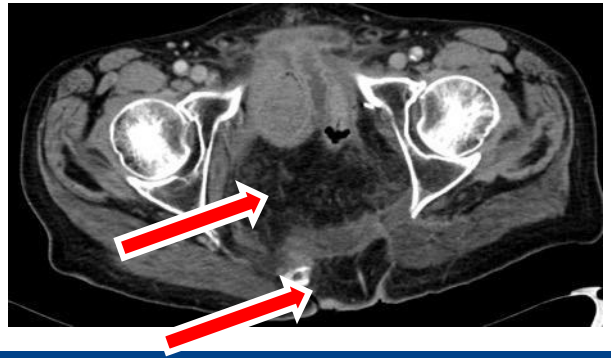
Anal cancer salvage surgery case

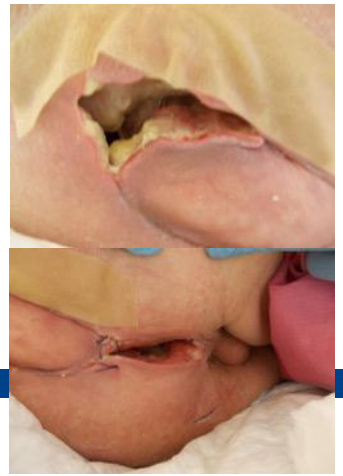












Maastricht UMC+

Do we need surgery when we have good RT?
Watch & Wait

Even smaller
- local excision
  - Completion TME?
  - RT?
  - Follow up?
- **primary** organ pres.

Small tumors
- 'additional RTx'
- functional indication
- **primary** organ pres.
- +/- local excision

Large tumors
- 'standard RTx'
- oncological indication
- **secondary** organ preserv.
- Watch & Wait

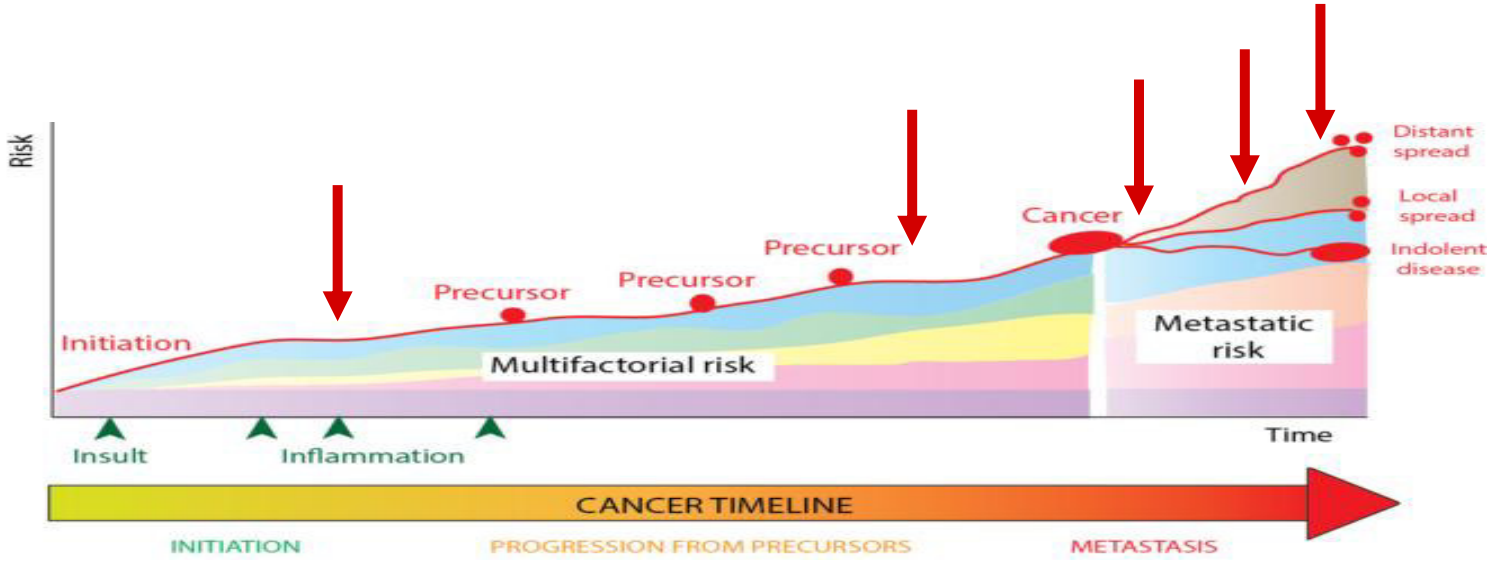
>75%

>50%

10-25%

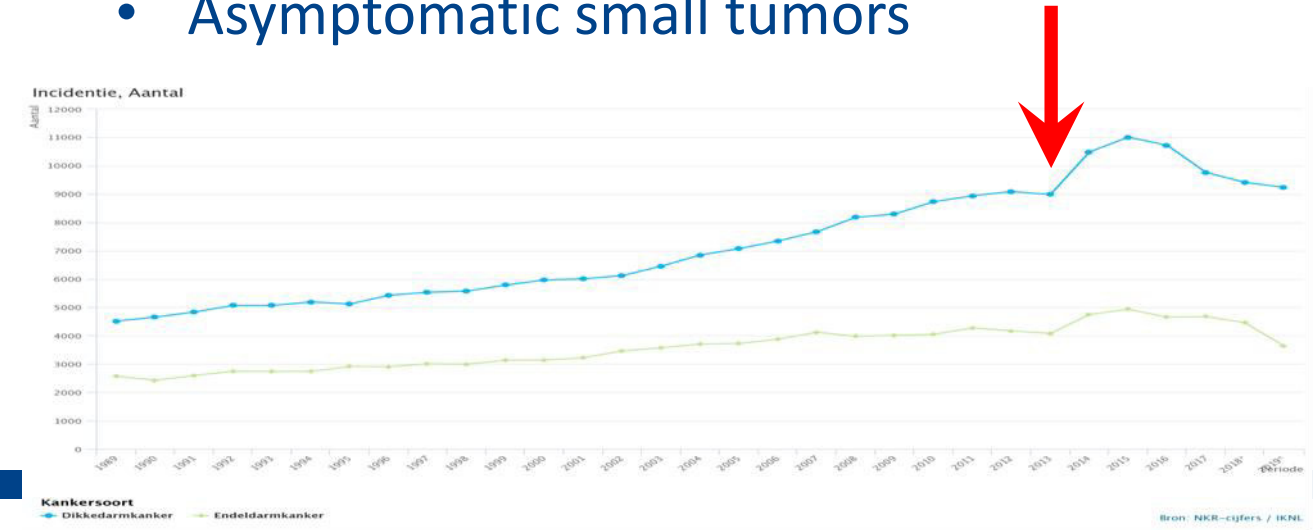
Organ Preservation

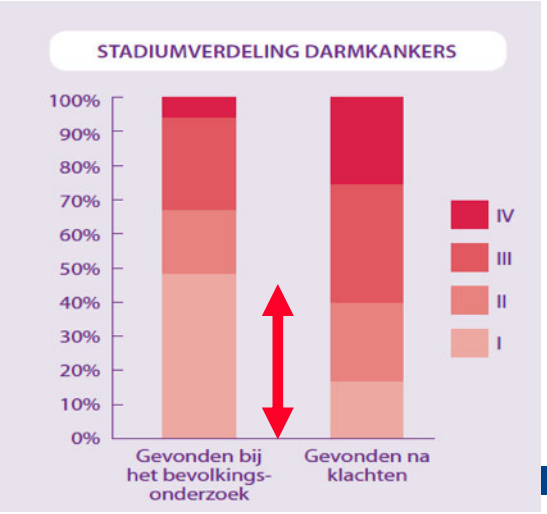
Where is the largest potential gain?



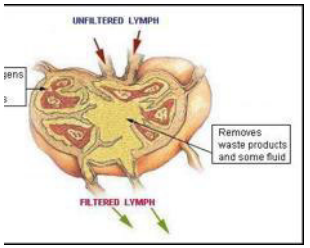
Bowel cancer screening

- Initial rise in incidence CRC, now ↓
- Adenoma → surveillance → prevention CRC
- Asymptomatic small tumors

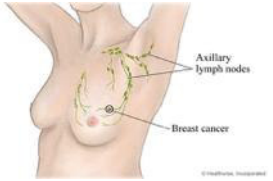


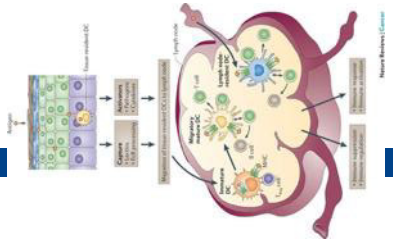


Lymph nodes – regional dissection



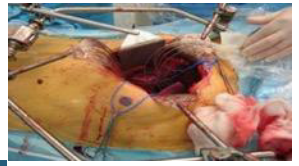
- Prognostic information
  - all solid tumours: lymph node metastases are risk factor for distant metastases (except maybe….)
  - can guide adjuvant therapy
- Therapeutic effect?
  - source of local recurrence
  - can we leave it in?
  - survival?
- Immunological role?

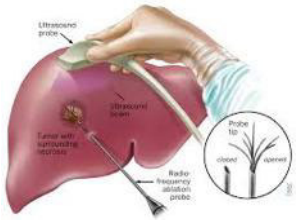


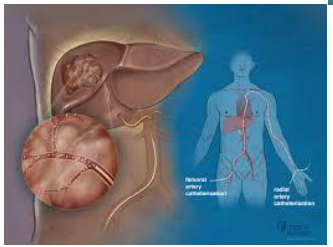


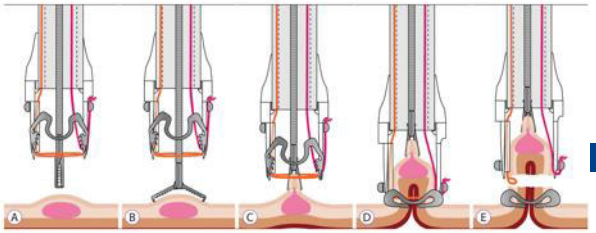
Locoregional therapy - progress

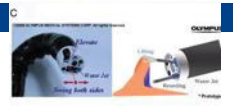
- Radiotherapy
  - External
  - Internal
- Interventional radiology
- Nuclear medicine
- Endoscopic procedures







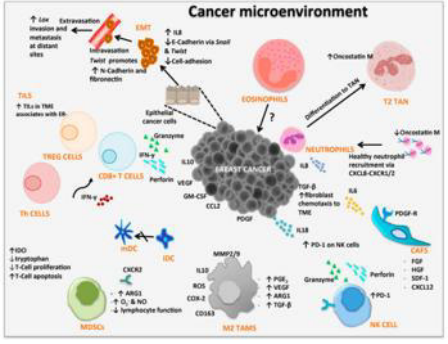


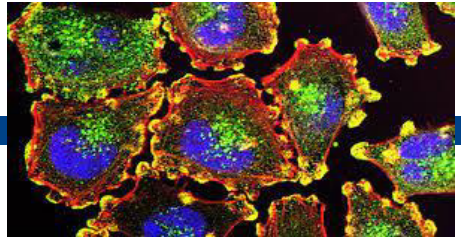


oncological outcome
functional outcome
morbidity

Biology, biology, biology

- Patient factors – frailty
- Genetics
- Tumour micro environment
- Immunology





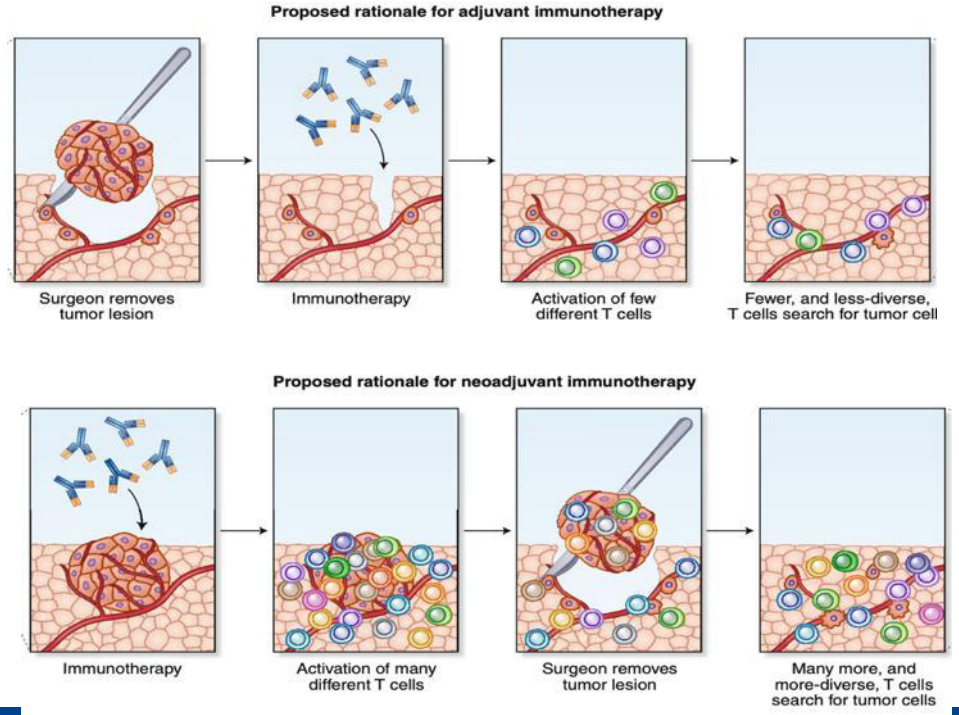
Progress in systemic therapy

Immunotherapy – targeted therapy

Melanoma, Lung cancer, Renal cancer, CRC, upper GI, breast,…

Immunotherapy in localised disease

before or after surgery?

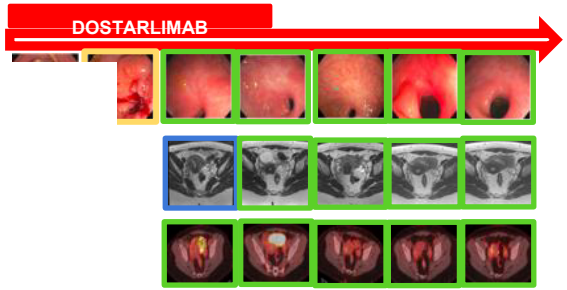


Neoadjuvant (before surgery)
Better recognition by the immune system when the tumor is still present
Treat micrometastases early
Easier removal of the tumor
Organ preservation
Potential for research and better understanding → improve treatment

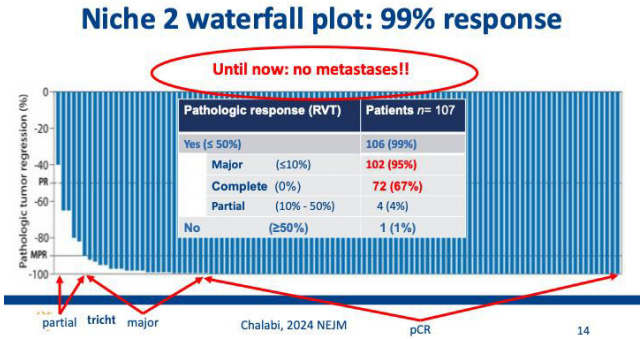
Adapted from: Versluis et al, Nat Med 2020

Immunotherapy – Colorectal cancer

- MSI tumours



Cercek, et al NEJM 2022

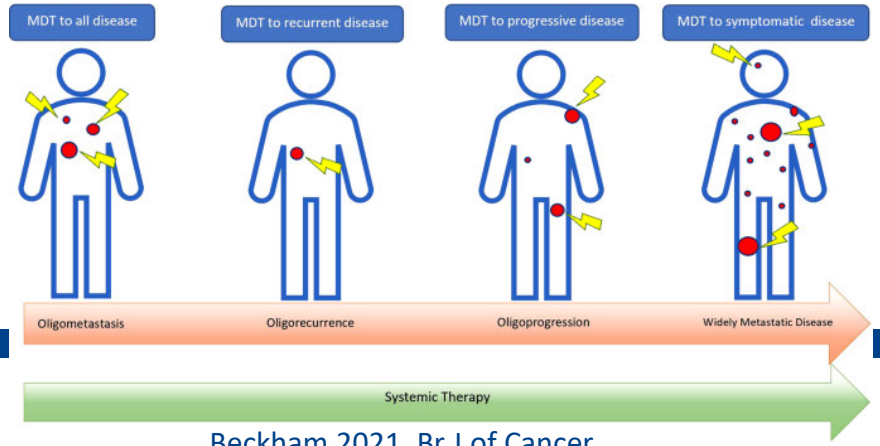


- MSS tumours
  + chemo
  + RT

Short course RT and short course ICI

Additional indications for surgery

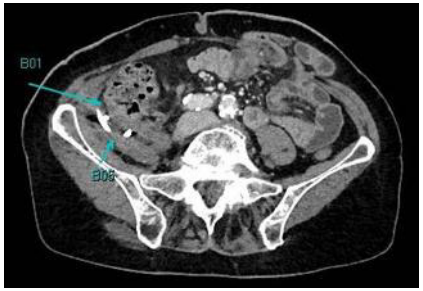
- Removing residual disease after neo-adjuvant therapy
  - Scarred, fibrotic tissue, anatomical planes?
  - Wound healing problems
- Complications of neo-adjuvant therapy
  - Stenosis, fistula, necrosis, ..
- Providing tissue
- Inoperable? Beyond cure?
  - Oligometastatic disease
  - Oligoprogression

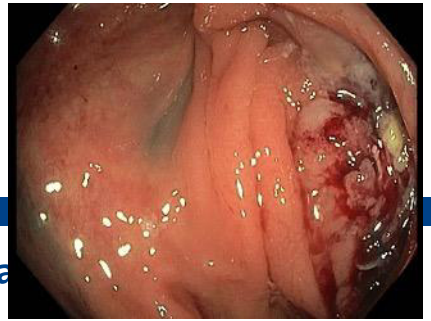


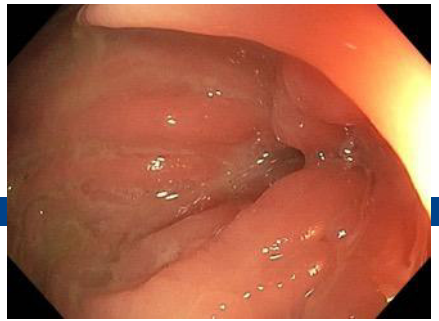
Beckham 2021, Br J of Cancer

Case – Surgical management complications

- 77 y/o lady right sided perforated sporadic MSI tumor
- Ileostomy, abces drain, double J → pembro → getting tired of it
- Do you resect the whole area?

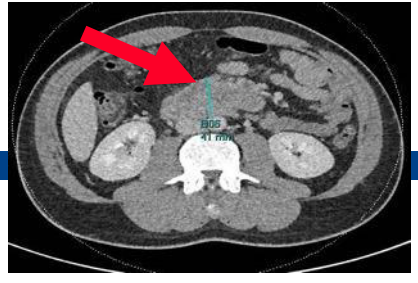




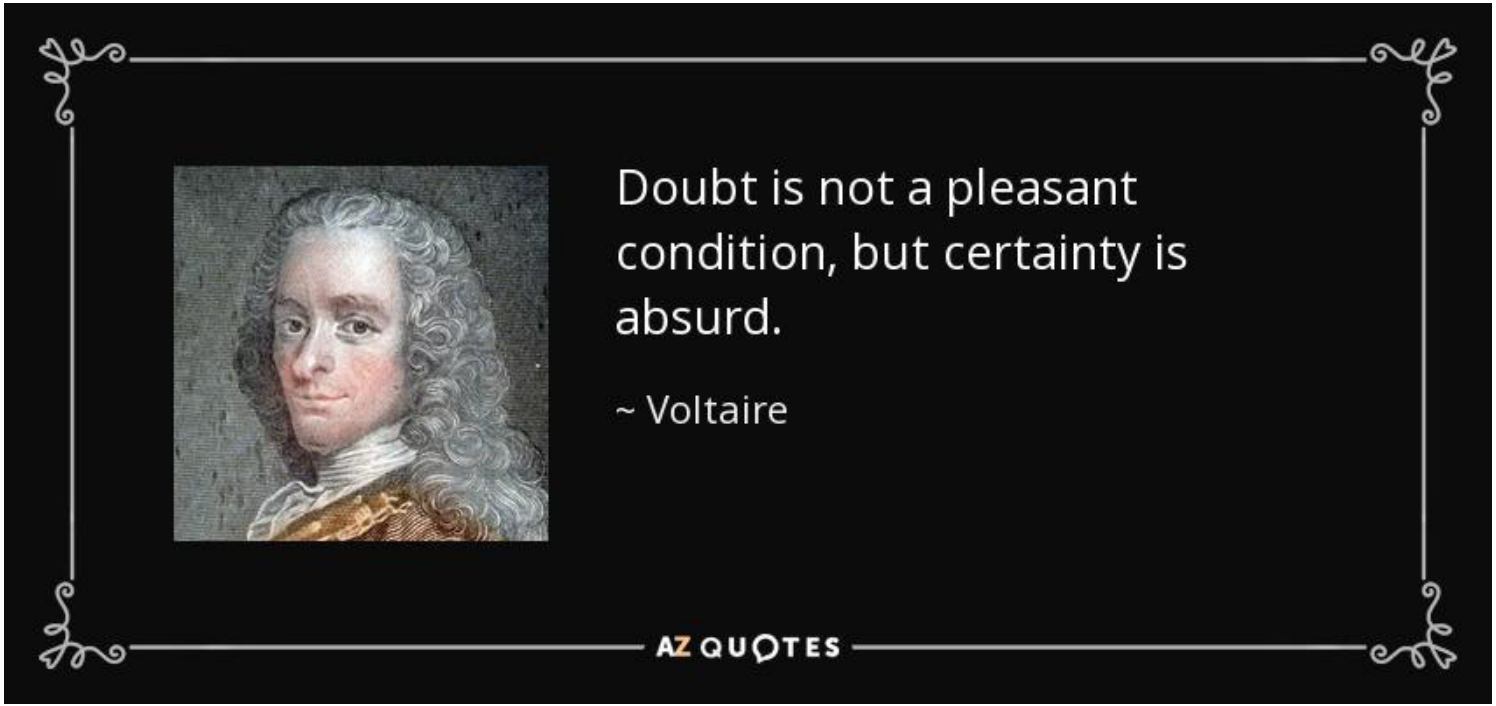


Case - Locally advanced or metastasized?

- 39 y/o man, large obstructing right tumor, ileostomy, Lynch
  - What do you tell him?
  - 2 yr pembro --> wants to get rid of stoma
- What are you going to resect?



Where is surgical oncology going?



Surgical Oncology tomorrow

- Conceptual changes
  - Increasing importance of functional outcome
  - Smaller tumours – lymph nodes?
  - ‘Adjuvant’ surgery?
  - Fixed strategy → adaptive strategy
- Additional indications
  - Metastatic disease – provide tissue
  - Treatment of complications
- Rediscovery of value of ’straight to surgery’