

Acute GI effects of radiotherapy

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Learning Objectives

Acute Radiotherapy Effects

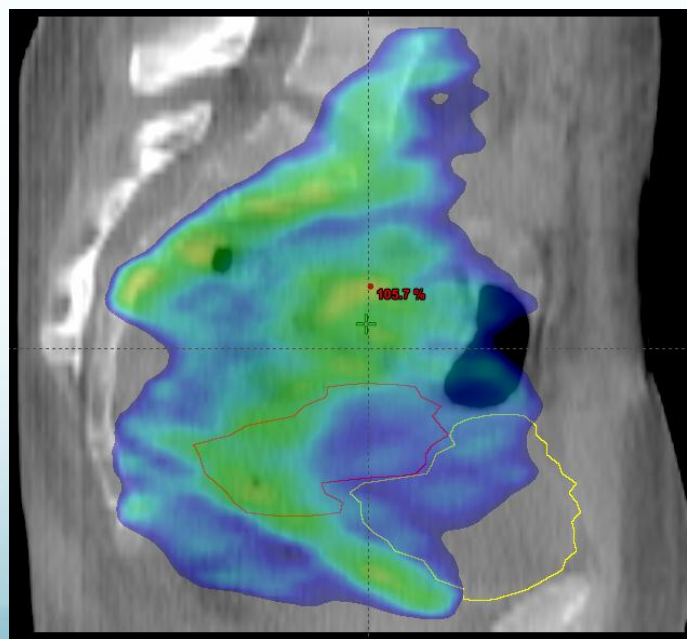
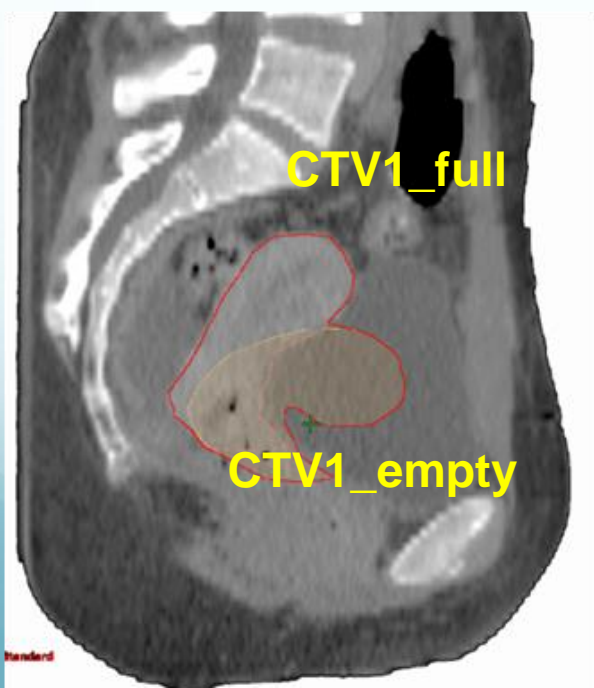
To learn about

- Presentations of GI toxicity
- Consequences of GI toxicity
- Treatment of GI toxicity
- Prevention of GI toxicity

Clinical Case

MJ aged 48

- Stage 3B adenoCa cervix
- Pelvic radiotherapy with IMRT
- Concomitant cisplatin and infusional 5FU



Clinical course

- Initial mild constipation
 - Analgesia induced
- Nausea during week 1
- Mild diarrhoea week 3
- More diarrhoea week 4
- Severe diarrhoea week 5, urinary frequency, anal pain

Presentation and Treatment

Radiotherapy Induced Nausea and Vomiting

- Pathophysiology unknown
- Rates with standard RT alone 28-39%
- Risk depends on
 - Location
 - Size of field
 - Dose
 - Type of RT
 - Patient factors F>M

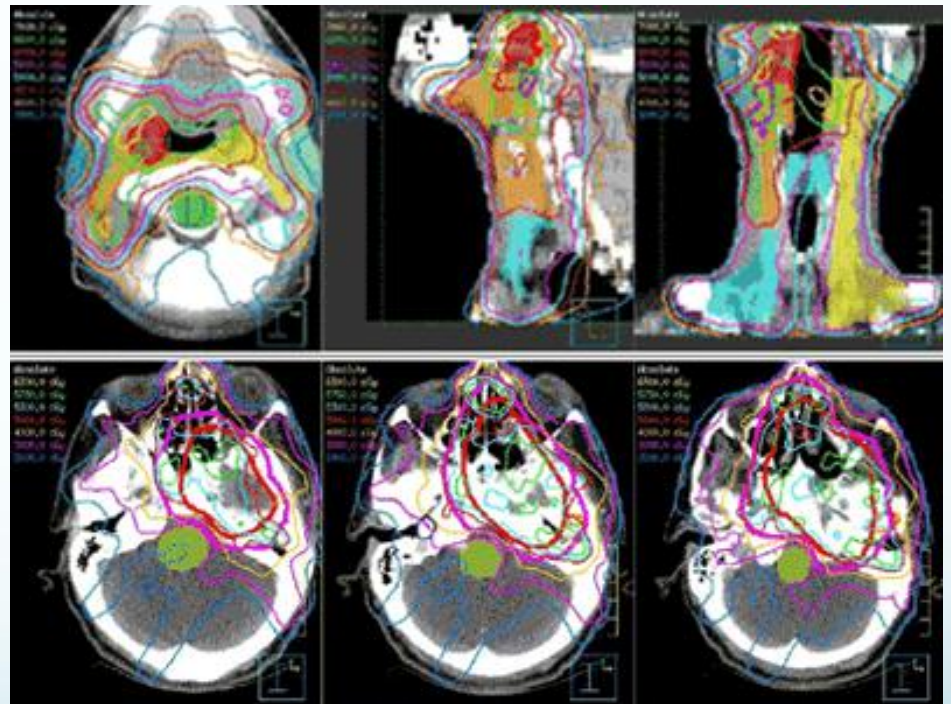
Emetogenic Potential	Risk of emesis w/o antiemetic prophylaxis	Location
High	>90%	Total-body irradiation (TBI), total nodal irradiation (TNI)
Moderate	60-90%	Upper abdominal irradiation, hemibody irradiation (HBI), upper body irradiation (UBI)
Low	30-60%	Cranium, craniospinal, head and neck, lower thorax, pelvis
Minimal	<30%	Breast and extremities

Treatment of RINV

- 5 HT3 receptor antagonists appear to be preferred agent
- Possibly combined with steroids if high risk
- Prophylaxis appears better than rescue
- Benefit highest in first week of RT
- NK-1 receptor inhibitors not widely studied but appear to be safe

Upper GI Effects

- Care on Treatment
 - Nutrition
 - regular dietician review
 - NG/PEG feeding
 - Dental hygiene
 - Skin nurse assessment
 - Speech and Language review
 - Physician review



RT associated diarrhoea

- 17,000 patients pa in UK undergo pelvic RT
- Up to 80% develop GI symptoms
 - Increased frequency
 - Urgency
 - Change in stool consistency
 - Pain
 - Bloating

Management

- No recognised guidelines
- Grade 1
 - Hydration, consider low irritant fibre diet, stool bulking
 - Prn loperamide
- Grade 2
 - Regular loperamide
- Grade 3
 - Consider admission
 - Consider opiates, octreotide
 - Stool cultures
- Grade 4
 - Admission, IV fluids

Consequences

Late Radiation Gastrointestinal Toxicity

- Incidence of late toxicity is correlated with acute toxicity
- One million people in UK have survived abdominal or pelvic cancer
- 90,000 suffer from pelvic radiation disease
- 50% of these suffer symptoms sufficient to inhibit daily living

Prevention

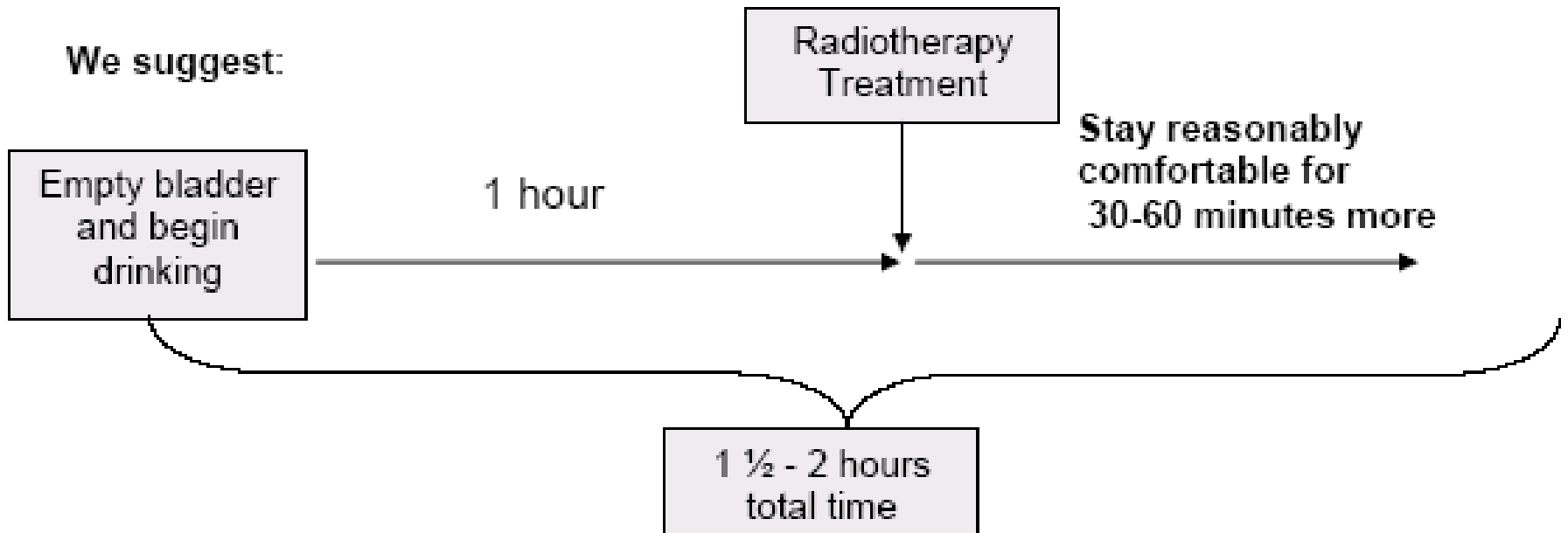
Lifestyle Modification

- Retrospective studies show increased GI symptoms in
 - Smokers
 - High BMI
 - Physically inactive

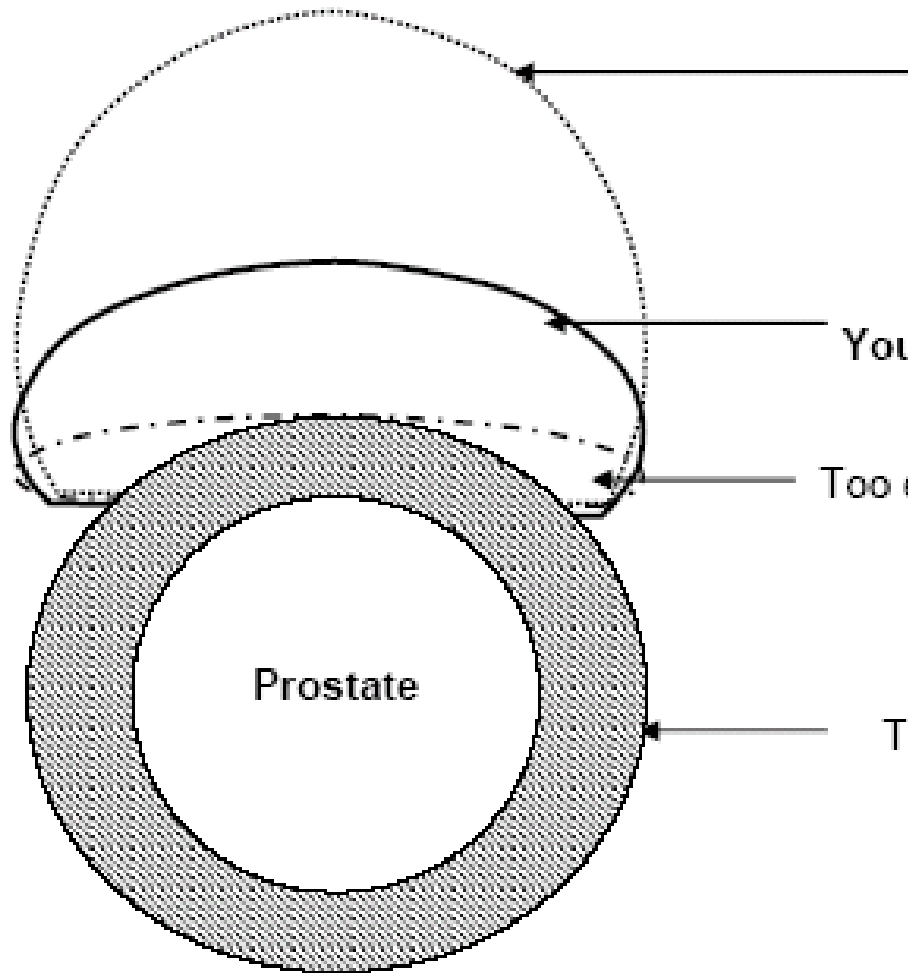
Diet

- Probiotics
 - Meta-analysis of 6 trials
 - Decreases acute diarrhoea
 - Doesn't appear to affect stool consistency/need for loperamide
- Fibre
 - Traditionally low fibre diet advised-no evidence for this-may worsen toxicity
 - Early results of Fibre study show high fibre may be beneficial
- Elemental diet
 - May decrease diarrhoea but unpalatable and don't result in weight improvement

Bladder Filling Protocol



A comfortably full bladder



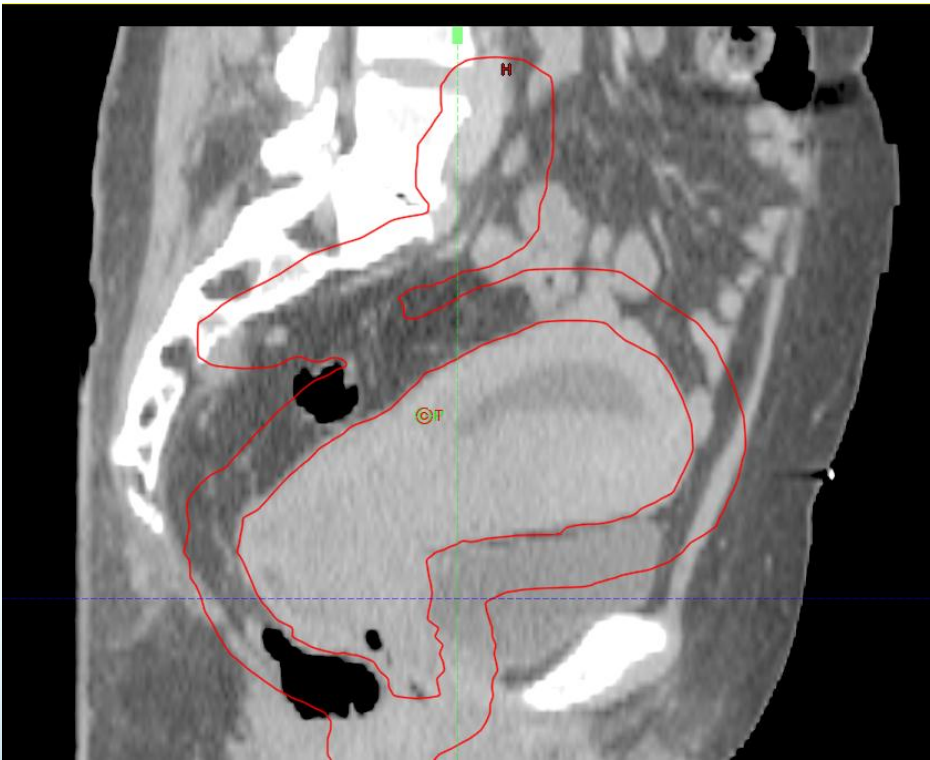
Too full- you will be uncomfortable and you may not be able to stay still, the treatment could be less accurate.

About half full – just right!
You will be comfortable and most of your bladder will not be treated

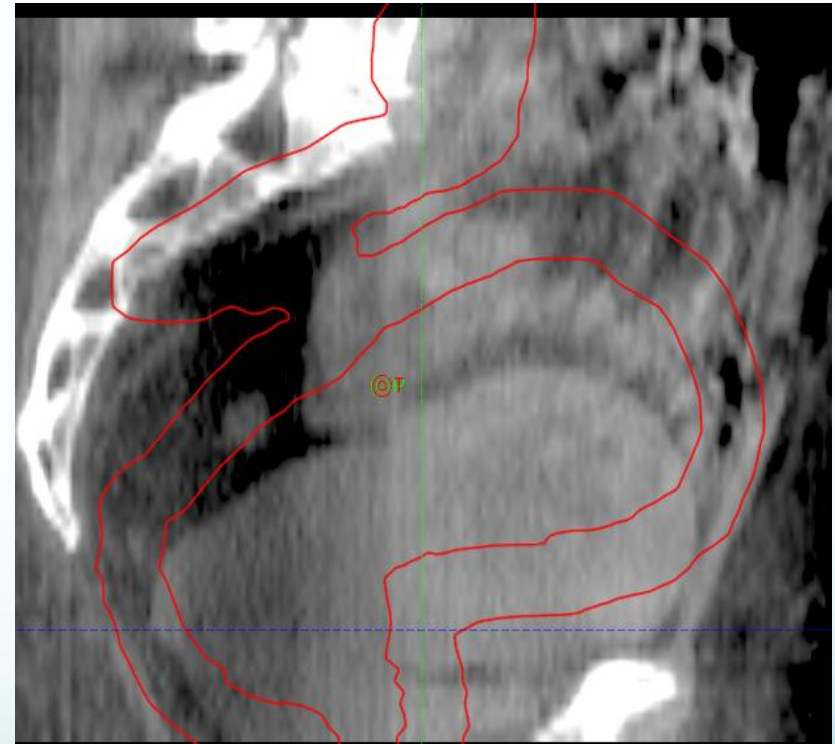
Too empty – too much bladder is treated.

Treatment area

Effects of empty bladder



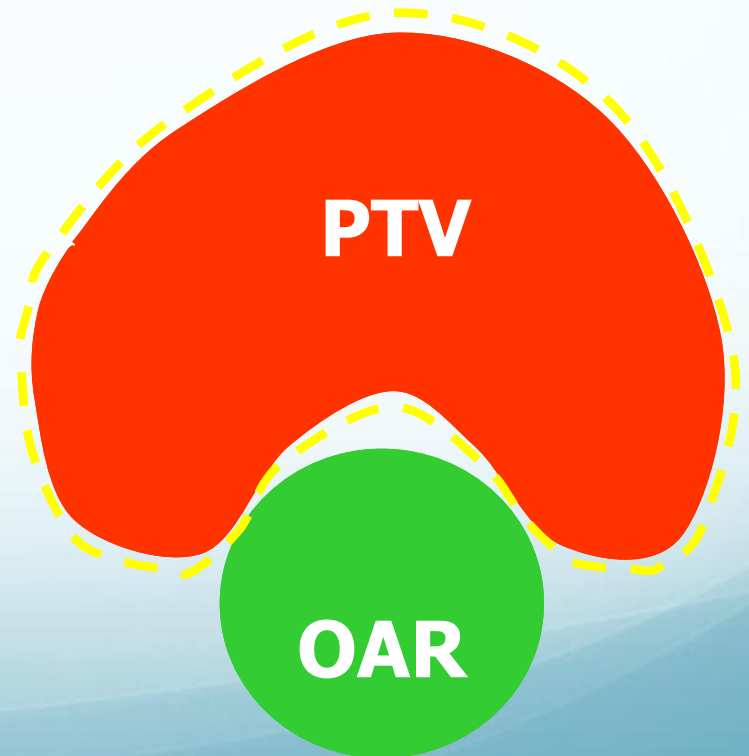
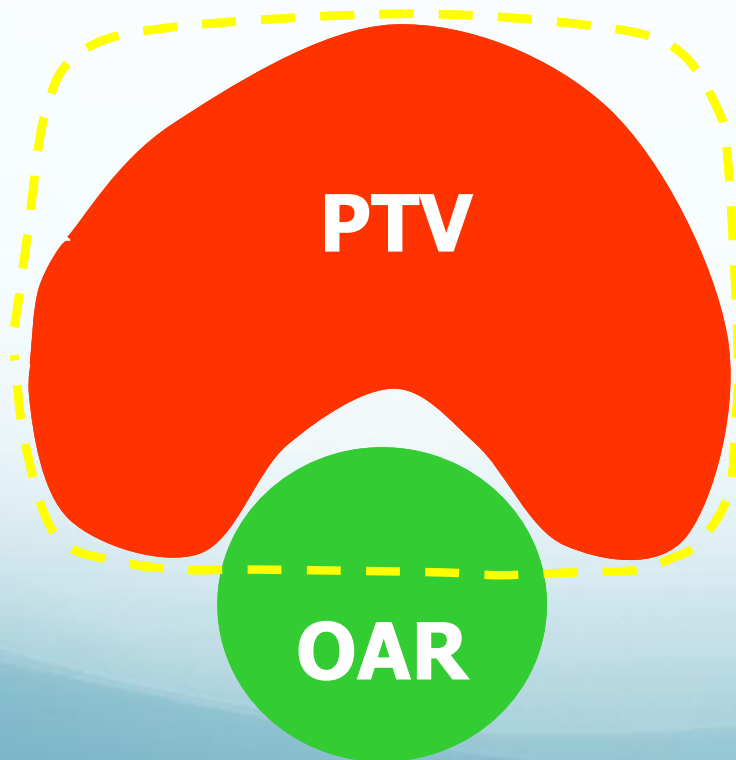
Small amount of bowel irradiated



Larger bowel volumes irradiated

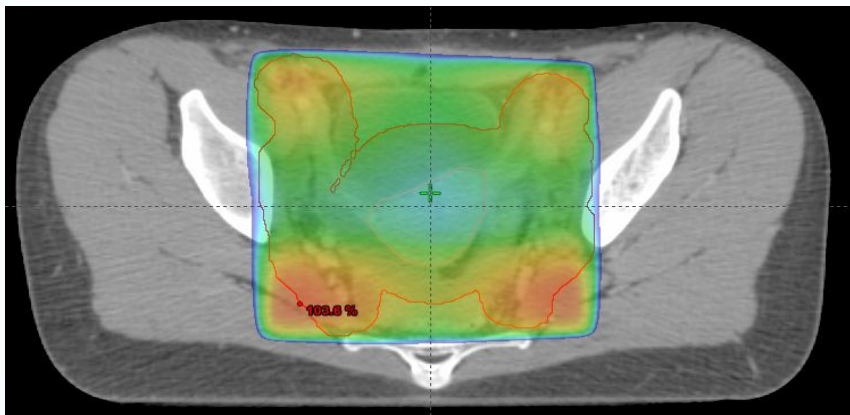
Prevention

- Theory-more conformal radiotherapy will automatically lower side effects and allow for dose escalation

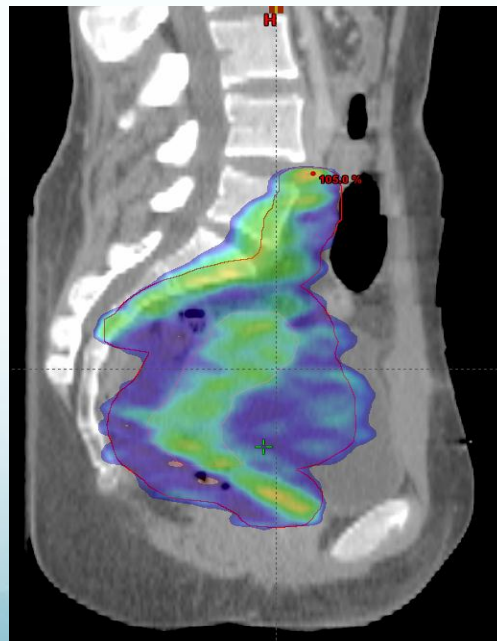
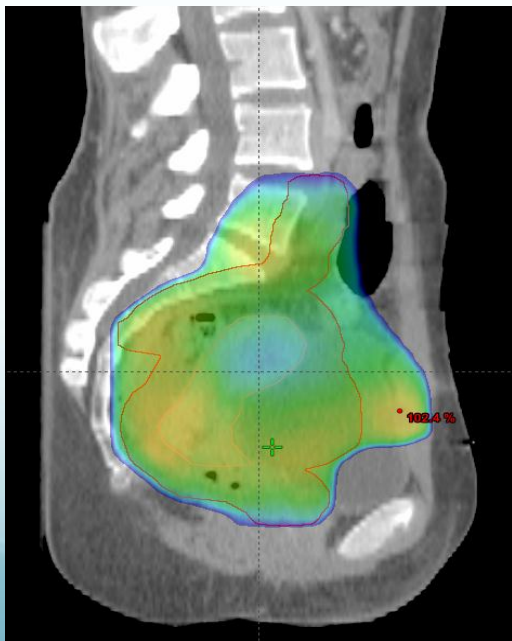
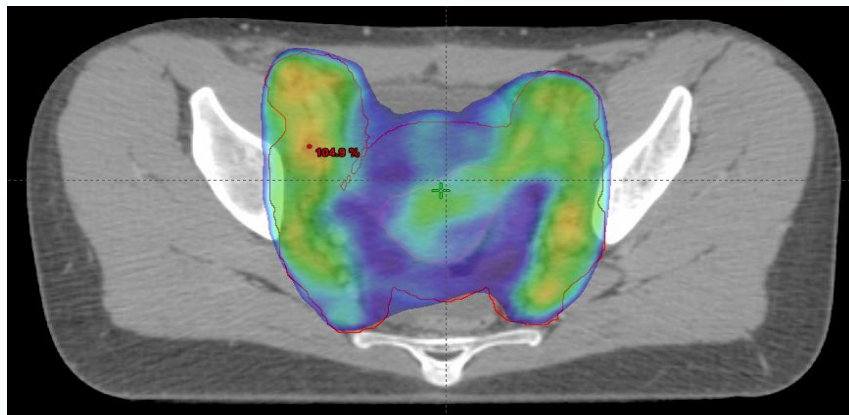


Dose distribution comparison: intact cervix

3D-CRT

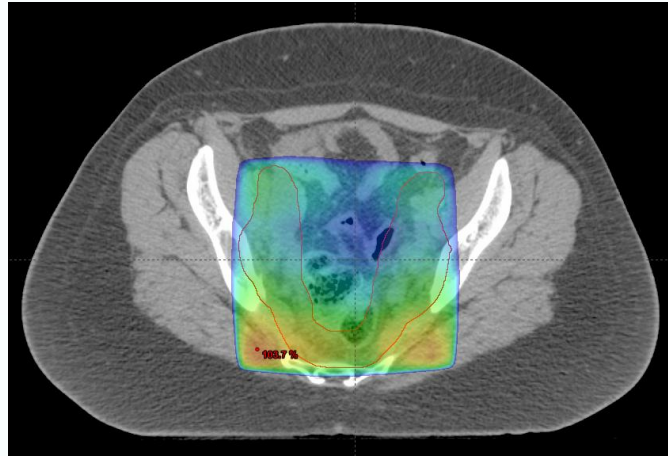


RapidArc

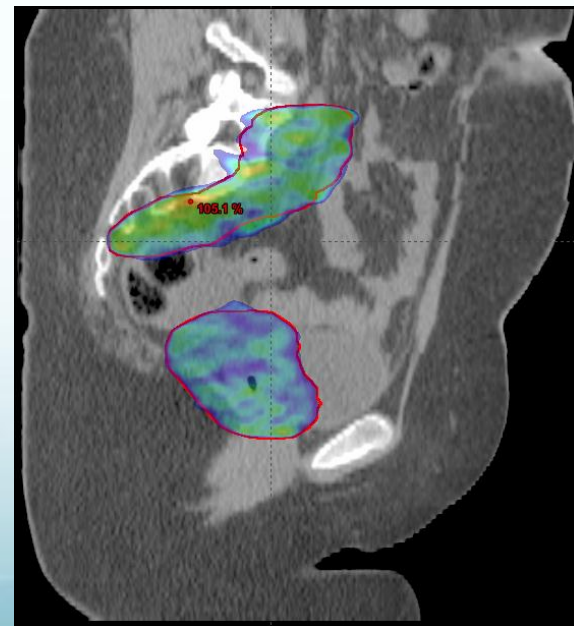
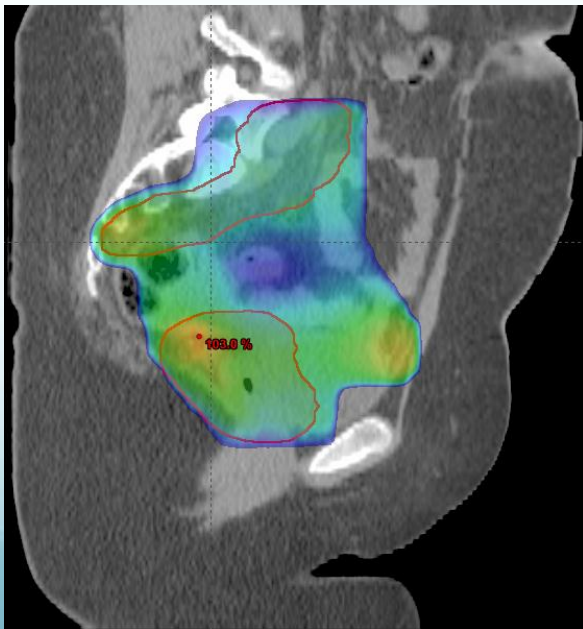
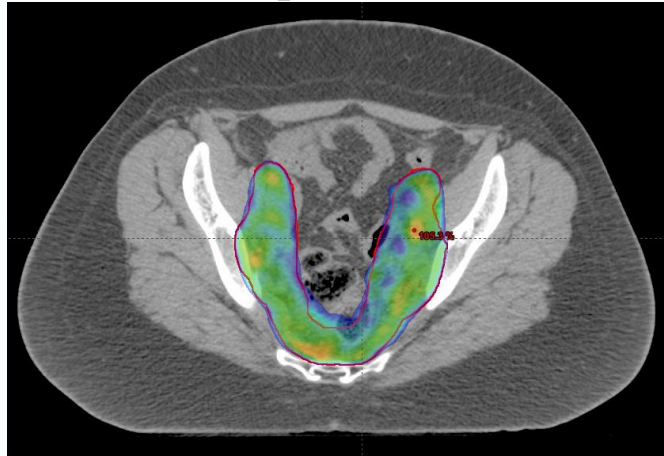


Dose distribution comparison: post-op case

3D-CRT



RapidArc



Pharmacological prevention

- Amifostine
 - Free radical scavenger
 - Reduces acute GI toxicity in 7 RCTs
 - Only 2 showed decreased late toxicity
- Statins
 - One prospective study showed decreased acute toxicity
- Anti-inflammatories
 - 5 RCTs-3 had increased toxicity-closed early
 - 2 had reduced diarrhoea
- Orgotein
 - Antioxidant superoxide dismutase
 - 3 RCTs show reduced acute GI toxicity

Don't appear to be useful

- Sucralfate enemas
- Butyrate enemas
- Misoprostol
- Octreotide
 - No benefit in prevention
 - Can be used in treatment
- Glutamine

Clinical Case



Clinical course

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Initial Management

Prior to RT

- Healthy balanced diet-no fibre modification
 - Treat constipation gently
 - Continue usual laxatives but prepare to tail off
 - Consider bulk forming laxative
- Good skin care esp in perineum
- Encourage good hydration
- Category 1 patient-the RT must continue!

Nausea

- 1st line with chemo
 - Ondansetron, dexamethasone domperidone
- 2nd line with chemo
 - Add appetitant
- Consider RINV
 - Ondansetron 8mg ½ hr before RT daily

Diarrhoea

- Initial
 - Move from normal diet to high fibre, low irritant
- Later
 - Add loperamide prn
- More severe
 - Regular loperamide
 - Consider codeine
- Severe
 - Consider admission
 - Stop 5FU
 - Ensure bladder filling and hydration
 - Treat anal pain-proctocedyl, predfoam

Conclusions

- Prevention is best approach
- Early treatment is essential
- Admit if symptoms not controlled at home
- More PROMS data needed to see effects of changing treatment modalities such as IMRT