Scope: To provide guidance for the management of radiotherapy reactions to non radiotherapy trained medical staff

Responsibilities: Non radiotherapy medical staff

Definitions:
LA – Linear Accelerator (treatment unit)
ADL - Activities of Daily living

1  Context

1.1 Acute radiotherapy reactions can occur during the course of radiotherapy or in the weeks immediately following treatment. Certain radiotherapy patients are deemed category 1 patients (see below)-that is they should not miss a day of radiotherapy since the tumour control is worse if the overall treatment time is prolonged. Thus it is important in these patients that their Consultant Clinical Oncologist is informed before the decision to miss a fraction of radiotherapy is made. In other patients the Consultant should be informed before 2 or more fractions are missed.

1.2 In all cases the relevant radiotherapy machine should be informed that the patient has been admitted as soon as possible. The RSCH machine telephone extension numbers are LA1 6601, LA2 6602, LA3 6603, LA4 6604, LA5 6605, LA6 6606, Brachytherapy 6615 or RT reception 6600.

1.3 Category 1 patients-receiving radical radiotherapy for:
- squamous cell carcinoma of the head and neck region
- non small cell carcinoma of the lung; small cell carcinoma of the lung
- carcinoma of the cervix, vagina or vulva
- carcinoma of the oesophagus
- squamous cell carcinoma skin
- bladder cancer
- high grade glioma

1.4 In general the following guidelines should be taken as a step-wise progression with the subsequent steps being added in to existing therapies. Treatment should occur within the multidisciplinary team setting including site specialist nurses, palliative care, dietitians, speech and language therapy etc.
2 Procedure

2.1 Acute Skin Reactions

The main principle of skin care in radiotherapy patients is to keep the skin well moisturised and to keep a skin reaction moist. It is important to use creams and dressings which do not contain metal since these can increase the radiotherapy reaction due to possible interaction between the metal and the X-rays. Soap in general should be avoided once moist desquamation is present, aqueous cream can be used as a soap substitute or 'Simple' soap. The patient should not have a thick layer of cream on at the time of radiotherapy as this in turn will worsen the skin reaction. Aluminium deodorants can be used unless they cause skin irritation.

2.1.1 Grade 1

Faint erythema or dry desquamation
Aqueous cream, Aloe vera gel
Apply 2-3x daily, wash off/fully absorbed before radiotherapy administered

2.1.2 Grade 2

Moderate to brisk erythema; patchy moist desquamation; mostly confined to skin folds and creases; moderate oedema
Intrasite gel or impregnated gauze such as Geliperm, Aloe vera, apply 2-3x daily, wash off/fully absorbed before radiotherapy administered. Steroid cream may be considered by Consultant Oncologist on unbroken skin
Around anus-proctosedyl ointment, instillagel (especially before bowel opening)
Consider simple oral analgesia

2.1.3 Grade 3

Moist desquamation other than skin folds and creases; bleeding induced by minor trauma or abrasion
Check for candida-if suspected start oral fluconazole 50mg od for 10-14 days, 100mg od if immunosuppressed
Assess for the presence of infection (including swab), especially if skin reaction suddenly worsens over 1-2 days or comes on earlier in the RT course than expected. If infection is suspected commence oral fluoxacillin 500mg qds and augmentin 625mg tds. If anaerobic infection is suspected add in metronidazole. In perineum start prophylactic ciprofloxacin 250mg bd and continue until moist desquamation healed (prophylactic ciprofloxacin was used in the anal cancer ACT 1 and 2 trials.) Use sensitive skin moist toilet wipes or gauze with aqueous cream to wipe after toileting. In the anal area procotosedyl suppositories or predfoam enemas can also be used.
Morphine sulphate in Intrasite, syringes for topical application, 10mg in 10ml. Apply top bd. Only available from RSCH pharmacy. Outpatient prescribing to be done only by members of the oncology team when the hospital pharmacy is open.

Regular oral analgesia-work up from ibuprofen, codeine, morphine

2.1.4 Grade 4

Skin necrosis or ulceration of full thickness of dermis; spontaneous bleeding from involved site
Admit and discuss with Consultant asap
Manage as above with plenty of analgesia, consider IV fluids if insensible losses high/oral intake poor

2.2 Un-controlled nausea/vomiting

Unlike the delayed onset of many radiotherapy associated symptoms, radiotherapy induced nausea and vomiting occurs soon after radiation is commenced, usually within hours of the first fraction. In general prophylaxis of nausea and vomiting is best. Therefore patients receiving radiation to their central abdomen should have prescribed Ondansetron 8mg to be taken ½ hr before radiotherapy starts with a further 8 mg dose later in the day if needed.

2.2.1 Grade 1

Loss of appetite without alteration in eating habits. 1 episode vomiting 24 hrs
Ondansetron 8mg bd po

2.2.2 Grade 2

Oral intake decreased without significant weight loss, dehydration or malnutrition; IV fluids indicated ≤ 24 Hrs. 2-5 episodes vomiting 24 hrs
Add metoclopramide 10mg tds
Assess whether IV hydration or IV antiemetics needed

2.2.3 Grade 3

Inadequate caloric or fluid intake; IV fluids, tube feeding or TPN indicated ≥ 24 hrs. ≥ 6 episodes vomiting in 24 hrs
Admit for hydration and IV antiemetics
Consider 3rd line antiemetics such as levomepromazine, haloperidol or cyclizine

2.2.4 Grade 4

Haemodynamic collapse
Resuscitate as appropriate
2.3 Uncontrolled Diarrhoea

Diarrhoea is expected with most pelvic radiotherapy. If the lower pelvis is irradiated (eg prostate only fields) this may be more of a sensation of tenesmus than change in stool calibre. Thus fybogel one sachet od may help to bulk the stool. Patients should be advised to take loperamide 2-4mg at the onset of diarrhoea with a further dose approximately 4 hours later if the diarrhoea continues. The patients can receive dietary advice from the Oncology dietitians, dietary advice from other sources should be avoided as it may result in inappropriate dietary modifications.

Radiotherapy induced diarrhoea will typically take several weeks to commence and usually increase gradually in severity. Thus the reaction will reach its maximum 7-10 days after the end of radiotherapy. It is important that regular motility agents are continued until this time and tailed off gradually. If the stool frequency is controlled on regular treatment it is because of that treatment thus the drugs should not be stopped abruptly or the diarrhoea will return. Always remember that constipation with overflow can present with loose watery stools.

In ostomy patients loperamide melts or tablets appear to be more effective than capsules.

2.3.1 Grade 1

Increase of <4 stools per day over baseline; mild increase in ostomy output over baseline
Commence loperamide 2-4mg if not already started.
If taking prn loperamide change to a regular regime- use a 2-4 mg increase on the previous daily cumulative dose and give this in divided doses half an hour before meals bd, tds or qds.

2.3.2 Grade 2

Increase of 4-6 stools per day over baseline; IV fluids indicated <24hrs; moderate increase in ostomy output compared to baseline; not interfering with ADL
Add in codeine phosphate 30-60mg qds
Assess need for IV fluids
Send stool cultures but do not withhold loperamide until results known a unless very strong clinical indication if infection rather than RT reaction
2.3.3 Grade 3

Increase of ≥7 per day over baseline; incontinence; IV fluids ≥24 hrs; hospitalisation; severe increase in ostomy output compared to baseline; interfering with ADL
Admit for IV fluids
Regular loperamide and codeine phosphate
Assess whether chemotherapy is also being administered and may be precipitating such a severe reaction
Discuss further measures with Consultant—you may need to exclude colitis using CT scanning

2.3.4 Grade 4

Haemodynamic collapse
Resuscitate as appropriate

2.4 Uncontrolled Mucositis

Mucositis mostly occurs in patients having radiotherapy to the head and neck region. It generally develops two weeks after commencing radiotherapy and begins to resolve two weeks after the completion of radiotherapy. Resolution of mucositis can take longer in patients who are undernourished or who have superadded infections. In these cases either the nutritional deficiencies need to be addressed or the infection (fungal, viral or bacterial) treated.
For further information refer to the Network mucositis policy

2.4.1 Grade 1

Erythema of mucosa
Difflam mouthwash (Corsadyl mouthwash not recommended)

2.4.2 Grade 2

Patchy ulcerations or pseudomembranes; symptoms not interfering with ADL
Add soluble aspirin mouthwash 300mg qds
Soluble paracetamol 1g qds may be required to facilitate a normal dietary intake
Gelclair may provide relief, those may be less effective in RT induced mucositis.
Assess for candidal infection—if suspected start fluconazole 100mg od PO or via PEG for 14 days.
2.4.3 Grade 3

Confluent ulcerations or pseudomembranes; bleeding with minor trauma; symptoms interfering with ADL
Substitute paracetamol with soluble cocodamol 30/500 qds (may require laxatives)
If this does not provide adequate relief oramorph 10mg 4hrly po/peg may be required or fentanyl patches with oramorph for breakthrough pain.
Enteral feeding should be considered, seek dietetic advice
May require hospital admission for PEG/RIG/NGT
Note. Fentanyl should not be used if patients using Emend (aprepitant) as an anti-emetic due to potentially fatal interaction

2.4.4 Grade 4

Tissue necrosis; significant spontaneous bleeding
Admit, resuscitate
Liaise with appropriate surgical team

2.5 Acute radiation pneumonitis

Acute radiation pneumonitis is seen 1-3 months after completing a course of thoracic radiotherapy, typically after the patient has received 40 Gy or more to the lung. Shortness of breath and a non-productive cough are the common presenting symptoms. Physical findings usually are not prominent but occasionally moist crackles, a pleural friction rub, or evidence of consolidation may be present. A low grade fever can also be present. Treatment requires high doses of prednisolone (40-60mg od) with lansoprazole cover and should be tapered gradually depending on response. Pneumonitis due to infection should be considered as a differential diagnosis before starting patients on high dose steroids. PE and exacerbation of COPD lie within the differential but the subacute onset, chest X-ray changes and time-correlation with radiotherapy often point towards radiation pneumonitis. Typical changes of radiation pneumonitis on chest X-ray show shadowing in geometric shapes corresponding to the radiation field. Some patients will have ‘sporadic’ radiation pneumonitis with pneumonitis outside the radiation field due to lung hypersensitivity

2.5.1 Grade 1

Asymptomatic, radiographic findings only
Commence oral steroids e.g. prednisolone 40mg od with lansoprazole 30mg od cover. To be tapered gradually depending on response.
2.5.2 Grade 2

Symptomatic not interfering with ADL
Oral steroids e.g. prednisolone 60mg od with lansoprazole 30mg od cover
Contact Oncology Consultant within 24 hrs of admission/assessment

2.5.3 Grade 3

Symptomatic interfering with ADL; Oxygen indicated. Admit for oxygen. Start prednisolone as above if not on it already

2.5.4 Grade 4

Ventilatory support indicated
Resuscitate as appropriate
IV steroids

2.6 Acute syndromes caused by cerebral/spinal cord oedema

Cerebral oedema gives a characteristic headache, characterised by occurring mainly in the morning, especially on waking. These headaches are due to raised intracranial pressure, and are treated with steroids with proton pump inhibitor cover.

It is good practise to consider steroids in every patient undergoing radiotherapy to the brain. As a general guide, oral dexamethasone 4mg od should be used in the first instance, with titration according to response. After the end of radiotherapy, this should be tailed off, and a written dose reduction plan given to the patient and documented in the notes.

In patients presenting with limb weakness, parasthesia and/or bladder or bowel dysfunction spinal cord compression should be considered and the pathway for malignant spinal cord compression followed. If the patient is being treated for a known spinal cord lesion and presents with worsening of these symptoms then discussion with a neurosurgeon should be considered. Refer to the spinal cord compression guidelines for more information.

2.6.1 Grade 1

Mild headache not interfering with function; Asymptomatic weakness, determined only on physical exam;
For headache commence oral dexamethasone e.g. 4-8mg od with lansoprazole 30mg od cover. For limb weakness start dexamethasone 8mg bd with lansoprazole 30mg od cover
Analgesia for headache-codeine is particularly effective in this group
If already on dexamethasone, increase dose depending on present dose.
2.6.2 Grade 2

Mild headache interfering with function, requiring analgesics; Symptomatic weakness interfering with function; not interfering with ADLs
For headache commence oral dexamethasone e.g. 4-8mg od with lansoprazole 30mg od cover. For limb weakness start dexamethasone 8mg bd with lansoprazole 30mg od cover.
If already on dexamethasone, increase dose depending on present dose.

2.6.3 Grade 3

Marked headache, altered consciousness; Symptomatic weakness; interfering with ADLs
For dexamethasone 8mg bd + lansoprazole 30mg od. Consider admission

2.6.4 Grade 4

Comatose; disabling weakness
Resuscitate as appropriate
For dexamethasone 8mg bd + lansoprazole 30mg. May need to be IV if unable to take orally
IV mannitol could be considered on discussion with the Clinical Oncology Consultant

References:
Summary of Interventions for Acute Radiotherapy-Induced Skin Reactions in Cancer Patients: A Clinical Guideline recommended for use by The Society and College of Radiographers 2011

American Society Clinical Oncologists; Managing side effects: Diarrohea
Document seen and agreed by:

Lead Clinical Oncologist
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Dated……..09/12/2012…………

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(Signed)……..A Flynn………………
Dated……..20/12/2012…………