Acute Oncology & Intensive Care
Who should we admit?

Phil Haji-Michael
The Christie, Manchester
The “patient journey” & Cancer

- Long time to an anticipated poor outcome
- Relatively well until a final decline
- May well have discussed last wishes with their family
- Palliative care planning and hospice care

Changing outcomes for cancer

MD Anderson Ovarian Carcinoma Survival: All Stages
Median survival time (years), by period of diagnosis and cancer\textsuperscript{1}
For some cancers the natural history is becoming more like a chronic relapsing remitting disease.
Despite large improvements for leukaemia (9-fold) and myeloma (6-fold) the median survival time still remains low with patients diagnosed in 2007 predicted median survival time at 3 and 2 and half years respectively.
"You’ve got six months, but with aggressive treatment we can help make that seem much longer."
Is survival alone the most important issue?

“You’ve got six months, but with aggressive treatment we can help make that seem much longer.”
Oncology peer review (NCAT)

- Oncology patients identified early
- Reviewed by an oncologist <24hr
- Acute Oncology Team
- Policies & protocols
  - (Neutropenic sepsis, Cord compression, unknown primary)
- “I hour target” for sepsis
The Acute Oncology Team

The “new game” in town
AOT costs >£100k/yr per trust

However most effect on diagnostic and disease progression pathways

Who does this work already?
New cancer diagnosis

- If obvious primary, fairly clear cut
  - Referral to an MDT
- Unknown primary
  - Many delays to diagnosis & referral
  - Very short life expectancy
  - Usually GI adenocarcinoma
  - Now have an Unknown Primary MDT
Non oncological problem

• Need to know disease status
  – Changing rapidly for some cancers
  – Difficulty in contacting team

• Still some resistance to manage appropriately because of the cancer label
  – E.g. PCI for STEMI
Disease related

• Spinal Cord compression
  – May be presenting feature in 20% of cases
  – Often missed, or picked up late
  – Backache & progressive neurology.
  – Loss of bowel & bladder function rarely recovers
  – Need steroids, MRI imaging
  – Traditionally single shot radiotherapy but this is changing towards neurosurgery particularly for selected patients.
Disease related

• SVCO
  – Odema, Distended veins, cough
  – Lung CA (lymphoma, breast)
  – Steroids initially
  – Radiotherapy and/or Stenting
What are oncology emergencies?

<table>
<thead>
<tr>
<th>Type</th>
<th>Acute Trust</th>
<th>Christie</th>
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</thead>
<tbody>
<tr>
<td>New cancer diagnosis</td>
<td>25%</td>
<td>2%</td>
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<tr>
<td>New non-oncological problem</td>
<td>31%</td>
<td>6%</td>
</tr>
<tr>
<td>Treatment toxicity</td>
<td>13%</td>
<td>74%</td>
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<tr>
<td>Disease progression</td>
<td>31%</td>
<td>18%</td>
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</table>
## Competencies

<table>
<thead>
<tr>
<th>Reason</th>
<th>%</th>
<th>GIM</th>
<th>Reason</th>
<th>%</th>
<th>GIM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unwell</td>
<td>3.4</td>
<td>x</td>
<td>Pain</td>
<td>6.5</td>
<td></td>
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<tr>
<td>Lines</td>
<td>1.5</td>
<td>x</td>
<td>Diarrhoea</td>
<td>2</td>
<td>x</td>
</tr>
<tr>
<td>Treatment</td>
<td>2.3</td>
<td></td>
<td>Dehydration</td>
<td>1</td>
<td>x</td>
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<tr>
<td>Blood Tx</td>
<td>7.6</td>
<td></td>
<td>Seizures</td>
<td>0.5</td>
<td>x</td>
</tr>
<tr>
<td>Nutrition</td>
<td>3</td>
<td></td>
<td>Extravasation injury</td>
<td>0.5</td>
<td></td>
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<tr>
<td>Fever</td>
<td>41</td>
<td>x</td>
<td>Hypercalcaemia</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Shock</td>
<td>2</td>
<td>x</td>
<td>Constipation</td>
<td>2</td>
<td>x</td>
</tr>
<tr>
<td>Nausea &amp; Vomit</td>
<td>6</td>
<td>x</td>
<td>Falls</td>
<td>0.5</td>
<td>x</td>
</tr>
<tr>
<td>Short of Breath</td>
<td>2.6</td>
<td>x</td>
<td>Collapse</td>
<td>0.5</td>
<td>x</td>
</tr>
<tr>
<td>Jaundice</td>
<td>0.5</td>
<td>x</td>
<td>DVT</td>
<td>0.5</td>
<td>x</td>
</tr>
<tr>
<td>Ascities</td>
<td>2</td>
<td>x</td>
<td>Mucositis</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Renal Failure</td>
<td>1</td>
<td></td>
<td>MSCC</td>
<td>0.5</td>
<td>x</td>
</tr>
<tr>
<td>Adverse Reaction</td>
<td>1</td>
<td>x</td>
<td><strong>Total GIM (%)</strong></td>
<td><strong>73</strong></td>
<td></td>
</tr>
</tbody>
</table>

All Acute Oncology admissions to the Christie Nov 2010
Treatment toxicity

• Neutropenic sepsis
• Also drug and radiotherapy induced complications
  – Mucositis
  – Pneumonitis
  – Cardiac toxicity
  – D&V
• Tendency for the newer agents to have strange and idiosyncratic side effects
Changes in Oncology treatment

- **G-CSF**
  - Neutropenia is now **NOT** an independant predictor of outcome following ICU admission
  
  Azoulay E, ICM 2000

- **Chemotherapy**
  - IL2 infusions for melanoma ⇒ Hypotension
  - Herceptin for Breast cancer ⇒ Cardiomyoapthy
  - Retinoic acid for AML M3 ⇒ ARDS/MOF
  - Retoximab for NHL & AML ⇒ Prolonged WCC↓
  - Melphalan for Myeloma ⇒ Lung fibrosis
Oncological Sepsis

Proportion surviving

Days following admission

- Neutropenic sepsis
  - 30 days: 93.7%
  - 1 year: 58.2%

- Non-Neutropenic sepsis
  - 30 days: 92.5%
  - 1 year: 47.6%
Infection

• Follow sepsis guidelines & NCAT targets
• Need broad spectrum cover
• Give early and send cultures
• Remove focus if possible
• If fever > 3 days consider adding antifungals

• Need senior micro advice
  – PCP, viral, further samples, local sensitivities
Timing of antibiotics

Kumar, CCM 2006;34(6):1589-96
Choice of antibiotics

Natural history of Sepsis Organ Failure

<table>
<thead>
<tr>
<th>Organ System</th>
<th>Peak Dysfunction Day</th>
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</thead>
<tbody>
<tr>
<td>Cardiovascular</td>
<td>Day 0</td>
</tr>
<tr>
<td>Respiratory</td>
<td>Day 1</td>
</tr>
<tr>
<td>Renal</td>
<td>Day 2</td>
</tr>
<tr>
<td>Coagulation</td>
<td>Day 3</td>
</tr>
<tr>
<td>Musculoskeletal</td>
<td>Day 3-4</td>
</tr>
<tr>
<td>GIT &amp; Liver</td>
<td>Day 5-7</td>
</tr>
<tr>
<td>CNS</td>
<td>Day 0-last to resolve</td>
</tr>
</tbody>
</table>
ICU outcome in Cancer

Solid tumor ICU outcomes

- Lung: ICU Mortality (%)
- Breast: ICU Mortality (%)
- Ovarian: ICU Mortality (%)
- Leukemia: ICU Mortality (%)
- Lymphoma: ICU Mortality (%)

Hospital Mortality (%) for:
- Lung
- Breast
- Ovarian
- Leukemia
- Lymphoma

ICU Mortality (%) for:
- Lung
- Breast
- Ovarian
- Leukemia
- Lymphoma
Changes in ICU management

Non-Invasive Ventilation

Mortality (%)

- Azoulay E, CCM 2001
- Hilbert G, NEJM 2001

Management if FiO2 > 60%

Facemask oxygen
Non-Invasive Ventilation
Shock management

- Pericardial & pleural effusions common
- Thromboembolic disease
- Sepsis related myocardial depression
- Iatrogenic cardiomyopathy
  - Anthracycline chemo
  - Left chest radiotherapy
  - Trastuzumab
Can we predict poor outcome?

• Most ICU scoring systems have a ROC of 0.8-0.9. Meaning only 50% of death is predictable
  Kopterides et al AJCC 2011;20:56-66

• What is the ghost in the machine?
  – Previous treatment history
  – Response to treatment Lecuyer et al CCM 2007;35:808-814
  – Reversibility
Is bedside clinical assessment any better?

30 day mortality (%)

- Too sick for ICU
- Admitted
- Too well for ICU

The “ICU Trial”

• Not for ICU
  • Patient refusal
  • Palliative care as the only treatment
  • Bedridden patients

• For ICU
  • Early phase treatment for bulky disease
  • Tumor lysis syndrome
  • In disease remission
  • Previously untreated disease

• The rest

Lecuyer et al. CCM 2007;35:808–814
The ICU trial

Lecuyer et al. CCM 2007;35:808–814
The ICU trial

Lecuyer et al. CCM 2007;35:808–814
Summary

- Acute Oncology is an AIM subspecialty
- Outcomes of both the disease and complications are improving
- Complications of treatment are not just sepsis
- Acute Oncology outcomes are broadly set by the time of ICU admission
- We are poor at predicting outcome form ICU, in those cases a trial of ICU is needed
- This needs to go hand in hand with good end-of-life care