Reducing the Door to Needle Time for Antibiotics in Suspected Neutropenic Sepsis using a Dedicated Clinical Pathway

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Neutropenic Sepsis

• Potentially fatal complication of systemic anti-cancer therapy

• Requires specialist, rapid input

• NICE Clinical Guidelines 151 advises door to needle time of less than 1 hour

• NHS Standard Contract for Cancer- clinical pathways for managing neutropenic sepsis are in place
Aim of Audit

• Initial retrospective audit
• Robust clinical pathway based on ‘Sepsis Six care Bundle’ for patients presenting with suspected neutropenic sepsis
• Reduce time to first dose of antibiotics
• Improve patient safety and clinical performance
• Adhere to NICE Guidance
Standard

- 100% patients presenting to an Oncology Helpline who have:
  - received chemotherapy within six weeks
  - infective symptoms and/or pyrexia of ≥38°C
  - receive antibiotics within one hour of arrival
Method

• December 2012-January 2013- Retrospective baseline audit

• 26 patients over six week period
  Arrival time
  Time antibiotics given
  Patient demographics
  Cancer details
  Aim of treatment
  Regime of chemotherapy
  First/Second line treatment or other
  Need for ITU/HDU admission
  Outcome- continuation of chemotherapy/cessation of chemotherapy/death
Patient Demographics

- Age range 31-78 (median 62.5)
- 42% male, 48% female
- Aim of treatment 65% palliative, 35% radical
- Primary disease:
  - 27% lymphoma,
  - 23% breast,
  - 11% GI,
  - 11% leukaemia,
  - 11% myeloma,
  - 11% gynae
  - 7% head and neck
Baseline Results of Door to Needle Time

- 32% of patients with suspected neutropenic sepsis received antibiotics within one hour of arrival to the dedicated oncology helpline.
Strategy for Change 1.

- Multidisciplinary Neutropenic Clinical Pathway with the principles of the Sepsis Six Care Bundle. ‘take three, give three’

✓ Take:  blood cultures
         lactate and bloods,
         urine output;

✓ Give:  IV fluids,
         100% O₂,
         IV antibiotics
Neutropenic sepsis pathway

**NEUTROPENIC SEPSIS PATHWAY**

This pathway is intended for all adult patients presenting with suspected neutropenic sepsis.

Neutropenic sepsis should be suspected in any **unwell** oncology patient within 6 weeks of systemic anti-cancer treatment; and any **unwell** Haematology patient (regardless of whether they are having current treatment or not).

**KEY POINTS:**
- Pyrexia / fever may not be present
- Treat as a medical emergency. Give first dose antibiotics as soon as possible and within 60 minutes of arrival.
- Do not wait for a neutrophil count before giving the first dose antibiotic.

Assess - are any one of the following symptoms present?

- **Pyrexia of 38°C** (or a recent history of pyrexia)
- **NEWS** equal to or greater than 3
- **Clinical Suspicion of Infection** – (check for CVC and PICC lines)
- **'Cold Sepsis' Symptoms** (> 36°C and unwell)

If yes to any one of the above assessments – initiate the ‘Sepsis Six’

**SEPSIS SIX TASKS:**

<table>
<thead>
<tr>
<th>TASK</th>
<th>TIME DONE</th>
<th>REASON TASK NOT DONE</th>
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<tbody>
<tr>
<td>1. <strong>100% Oxygen</strong></td>
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<td>- Prescribe and give 15l/min via facemask with reservoir</td>
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<td>2. <strong>IV fluid bolus</strong></td>
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<td>- Give a 500ml - 1000ml bolus of Hartmann's. Larger bolus may be required e.g. if systolic BP less than 90 or lactate greater than 4, consider 20ml/kg. Discuss with Senior.</td>
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<td>3. <strong>Blood Cultures</strong></td>
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<td>- Take cultures before first dose antibiotic (but do not delay antibiotic if blood cultures are)</td>
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<td>- Take peripheral and CVC cultures if possible.</td>
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<td>- Culture other sites as clinically indicated e.g. sputum, urine, wound etc.</td>
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<td>4. <strong>IV antibiotics</strong></td>
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<td>- Use Trust antibiotic guidelines (under NEUTROPENIA GUIDELINES)</td>
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<td>- Ensure the &lt; 60 minute ‘Door to Needle’ time</td>
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<td>- Nurses can use the Trust TAZOCIN PGD - (if signed off)</td>
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<td>5. <strong>Blood + Lactate</strong></td>
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<td>- FBC, U&amp;E, LFT, CRP; Coting (INR and APPT)</td>
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<td>- Lactate on arterial or venous sample</td>
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<td>- Group and Save sample; Glucose sample</td>
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**6) Monitor Urine Output**

Consider catheter if severe sepsis. Monitor output hourly. Dip urine and send MSU/CSU.

- Fluid balance chart YES/ NO
  - Catheter YES/ NO

Document below the tasks not completed within 1 hour and why

**AFTER THESE SIX TASKS, REMEMBER: MASCC SCORE**

- Scoring:
  a. Burden of illness: No or Mild symptoms = 5
  b. NO hypotension = 5
  c. No COPD = 4
  d. Solid Tumour or Haematology patient with no previous/current fungal infection = 4
  e. NO dehydration = 3
  f. Outpatient status at onset of fever = 3
  g. Age > 60 years = 2

Score ≥ 21 = low risk
Score ≤ 20 = high risk
(maximum score is 26)

IF SEVERE SEPSIS – (SEPSIS + SYSTOLIC BP < 90 mmHg - OR LACTATE > 2 - OR EVIDENCE OF ORGAN DYSFUNCTION) - OBTAIN A SENIOR CLINICAL OPINION.

CONSIDER CONTACTING ACUTE CARE RESPONSE TEAM ON BLEEP 1700

ONCOLOGY / HAEMATOLOGY ON-CALL CONSULTANTS ARE AVAILABLE THROUGH SWITCHBOARD

Date and Time:

<table>
<thead>
<tr>
<th>Role</th>
<th>Date and Time</th>
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<tbody>
<tr>
<td>Your name and role:</td>
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<tr>
<td>Senior Opinion obtained from:</td>
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<tr>
<td>Oncology / Haematology Opinion obtained from:</td>
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<td>Handed over to Dr:</td>
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Strategy for Change 1 (cont.)

• Antibiotics given without knowledge of neutrophil count.

• Act on suspicion of neutropenic sepsis

• Agreement with consultants and microbiologists
Strategy for Change 2.

- Patient Group Direction (PGD)
- Nurse Led Prescribing
- Delivery of First dose of Antibiotics
- Implementation through education
Strategy for Change 3.
• Multidisciplinary Team Education Programme

• All staff working in Oncology Department

• Health care assistants, nursing staff, junior doctors and senior medical staff

Ongoing strategy
• Prospective re audit
Prospective reaudit over 2 week period with implemented changes

• April-May 2013

• 97% of patients received antibiotics within one hour presenting to oncology helpline if suspected neutropenic sepsis (compared to 32% before changes implemented)
### Retrospective Audit prior to Clinical Pathway Implementation

- **<1 hour**: 32%
- **1-1.5 hours**: 11%
- **1.5-2 hours**: 5%
- **2-3 hours**: 11%
- **3-4 hours**: 5%
- **> 4 hours**: 11%

### Prospective Audit subsequent to Clinical Pathway Implementation

- **< 1 hour**: 97%
- **1-1.5 hours**: 3%
Discussion

• NICE guidance - expeditious use of antibiotics suspected neutropenic sepsis
  • Reduces morbidity
  • Reduces mortality

• Strategies for Change
  • Positive outcome for patients
  • Robust dedicated clinical pathway
Conclusions

• Dedicated clinical care pathway
• Education
• Cost neutral changes
• Radical change in patient pathway
• Meeting External Peer Review requirements

• Simple changes in clinical practice lead to big changes in patients care and outcomes
RED FLAG SEPSIS
Systolic B.P < 90 mmHg
Lactate > 2 mmol/l
Heart rate > 130 per minute
Respiratory rate > 25 per minute
Oxygen saturations < 91%
Responds only to voice or pain/ unresponsive
Purpuric rash

(Sepsis Trust Website)
Commissioning for Quality and Innovation (CQUIN) Guidance for 2015/16 (NHS England)

- 2a: The total number of patients presenting to emergency departments and other units that directly admit emergencies who met the criteria of the local protocol and were screened for sepsis.

- 2b: The number of patients who present to emergency departments and other wards/units that directly admit emergencies with severe sepsis, Red Flag Sepsis or Septic Shock (as identified retrospectively via case note review of patients with clinical codes for sepsis) and who received intravenous antibiotics within 1 hour of presenting.