GUIDELINES AND AUDIT IMPLEMENTATION NETWORK

A Regional Multi professional Audit of the Management of Neutropenic Sepsis in Adults Receiving Systemic Anti-Cancer Therapy (SACT)

Project Leads:

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Audit Project Team:

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Audit Period June 2010

Final Audit Report September 2012

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Introduction: Background and Context

Systemic Anti Cancer Therapy (SACT), a term that includes cytotoxic chemotherapy, hormone therapy and novel targeted therapies is a commonly used treatment in the management of cancer.

A recent Northern Ireland Cancer Network (NICaN) review of chemotherapy service demonstrated a 74% increase in SACT administration over four years. This increase is likely to continue as cancer incidence in the population grows due to demographic changes and as the availability of new treatment options, particularly life extending drugs, continues to expand. Cancer has recently overtaken cardiovascular disease as the biggest cause of death in Northern Ireland.

Neutropenic sepsis is a potentially life threatening condition for which timely intervention can be life saving. The 2008 NCEPOD report into patients dying within 30 days of SACT raised significant quality and safety concerns about the recognition and management of neutropenic sepsis. Furthermore, one of the recommendations of the 2009 National Chemotherapy Advisory Group report was that policies for management of neutropenic sepsis should be agreed across a network and readily assessable. This has since been supported by the Manual of Cancer Services Improving Outcome Standards for Acute Oncology Services which was produced in 2010.

A NICaN Neutropenic Sepsis Guideline had been written and was approved by the NICaN board for dissemination across the Network in July 2010. This guideline aims to reduce morbidity and mortality for patients presenting with neutropenic sepsis by raising recognition that it is a time-dependent condition and provides simple guidance on the management of patients within the first 48 hours of admission. It includes the standard of a door to needle time of one hour and gives guidance on the baseline observations that should be undertaken. It is written in a format that provides easy to follow clinical logarithms for clinical staff to follow.

The guidelines specify that any patient presenting to hospital within 6 weeks of SACT should be assumed to have neutropenic sepsis until proven otherwise.

Given the importance of this syndrome and the time-dependent nature of treatment it was felt critical to accurately assess implementation of the new guidance across the network.

An application was submitted by a small team from the Cancer Centre with agreement from the NICaN Chemotherapy Group that the four Cancer Units would nominate their own local multi professional project teams.

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Aims & Objectives

The aim of the audit was to improve the care of patients with neutropenic sepsis. The primary objective of the audit was to compare the management of patients who presented to Emergency Departments or cancer treatment day units and wards within the Cancer Centre or Cancer Units with complications of SACT focusing on neutropenic sepsis against the management specified in the NICAN guidelines. The audit focused on whether the initial medical assessment and investigations were performed and appropriate treatment given in a timely manner. Data was also collected regarding the primary cancer sites that were most associated with neutropenic sepsis, the number of patients admitted and length of admission for patients admitted with complications of SACT.

The Audit Team

A project team was recruited which would ensure multi-professional representation from across the region.
The team lead was Dr. Paula Scullin who was one of the principle authors of the NICaN Neutropenic Sepsis Guidelines, with Dr Jane Hurwitz undertaking to lead on the collation and co-ordination of the data capture and analysis across the Cancer Centre and four Cancer Units.
Other team members included
Janet Morrison, Macmillan Information and Support Centre manager
Sally Campalani, Senior Nurse, Cancer Services BHSCT
June McAuley, Chemotherapy Unit Manager, NHSCT
Ruth McDonald, Assistant Governance Manager, NHSCT
Caitlin McCoy, Chemotherapy Services Manager, SEHSCT
Elizabeth England, Cancer Service manager, WHSCT
Fiona Reddick, Oncology Nurse Specialist, SHSCT

Audit Design and Methodology

Audit Standards: The following audit standards were agreed with the NICaN SACT group

	Criteria	Target (%)	Exceptions	Source & Strength* of Evidence	Instructions for where to find data
1	Patients who have suspected neutropenic sepsis should have their first dose of antibiotics within 1 hour of entering the hospital.	100		C	NICaN Neutropenic sepsis policy
2	Patients who are within 6 weeks of SACT should have temperature, pulse, BP, RR, O2 sats on arrival in hospital and be commenced on an early warning score chart (EWSC)	100		C	NICaN Neutropenic sepsis policy
3	Patients who have suspected neutropenic sepsis should have medical assessment to identify potential sources of infection and appropriate investigations as specified in the NICaN guideline	100		C	NICaN Neutropenic sepsis policy
4	Patients who have neutropenic sepsis should be closely observed during the first 48 hours of admission with EWSC every 30 min until stable, then 3 hourly for first 24 hours then 6 hourly day 2	100		C	NICaN Neutropenic sepsis policy
5	Patients who have neutropenic sepsis should have appropriate monitoring of antibiotics and fluid & electrolyte replacement	100		C	NICaN Neutropenic sepsis policy

Audit Tool and Data collection

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An audit template was devised by the Cancer Centre team and agreed following consultation with staff from each of the four units (Appendix 1).

Data was collected over a 6-week period beginning on June 1st 2011.

Data was initially analysed within each Trust and subsequently sent centrally for regional analysis.

General findings

1. **Volume of Patients with Neutropenic sepsis and Trust of Admission**

Table 1		
Location	**Number of patients**	**%**
Belfast Health and Social Care Trust (BHSCT)	28	53
Northern Health and Social Care Trust (NHSCT)	11	21
South Eastern Health and Social Care Trust (SEHSCT)	11	21
Southern Health and Social Care Trust (SHSCT)	1	2
Western Health and Social Care Trust (WHSCT)	2	4
Total	53	

Comment: 53 patients were identified as admitted with neutropenic sepsis throughout the network. The discrepancy in the numbers of patients admitted by each of the Cancer Units probably means that not all patients were captured. The process of data collection in future audits will be reconsidered to try to improve data capture.

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2. **Primary cancer site of patients who were admitted with Neutropenic sepsis**

Table 2		
Primary site	**Number of patients**	**%**
Breast malignancy	16	30
Non Hodgkin's Lymphoma	9	17
Acute Myeloid Leukaemia	6	11
Germ cell tumours	5	9
Lower Gastro-intestinal malignancy	4	8
Sarcoma	4	8
Genito-urinary malignancy	2	4
Chronic Lymphocytic Leukaemia	2	4
Head & Neck malignancy	1	2
Myeloma	1	2
Acute Lymphoblastic Leukaemia	1	2
Gynaecological malignancy	1	2
Upper Gastro-intestinal malignancy	1	2

Comment: The most common primary site of cancer in these patients was breast cancer (30%). This is not a surprising finding as breast cancer is one of the most common cancers and the relatively higher risk of neutropenic sepsis from cytotoxic regimens used to treat this disease is well recognised.

3. **SACT cycle number in patients admitted with Neutropenic sepsis**

Table 3		
Cycle number	**Number of patients**	**%**
1-3	32	60
4-6	14	26
6+	2	4
Post bone marrow transplant	2	4
unknown	3	6

Comments: The majority of patients developed neutropenic sepsis during their first 3-cycles of SACT (60%). It is recognised that neutropenic sepsis is most likely to occur with the first cycle of SACT and this is important to highlight in patient education.

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4. Route and Time of Admission of Patients with Neutropenic sepsis

4a. Route of Admission of Patients with Neutropenic sepsis

Table 4a		
Route of admission	**Number of patients**	**%**
ED	32	60
Outpatient chemotherapy unit	6	11
Direct to ward	4	8
Current inpatient	11	21

4b. Time of Admission of Patients with Neutropenic sepsis

Table 4b		
Time of admission	**Number of patients**	**%**
09.00-17.00	21	40
17.00-00.00	27	51
00.00-09.00	5	9

4c. Helpline use in Patients Admitted with Neutropenic sepsis

Table 4c		
Helpline contacted?	**Number of patients**	**%**
Yes	29	55
No	7	13
n/a	7	13
unknown	10	19

Comment:

Route of Admission

Across the region the majority of patients (60%) were admitted via the Emergency Department (ED). A further 20% of patients developed neutropenic sepsis while receiving inpatient care for another complication of SACT. This highlights the importance of maintaining a high index of suspicion for development of neutropenic sepsis in patients admitted for other complications of SACT such as nausea and vomiting.

Time of Admission

The majority of patients were admitted outside the standard working day (60%). This is of concern given that staffing levels and cover of all services is reduced out of hours at a time when these patients are most likely to present.

Helpline contacted?

The helpline was not contacted in all cases. It is difficult to capture the reasons that some patients do not contact the helpline in a retrospective audit but use of the helpline is important to stress in patient education.

5: Length of admission in patients admitted with Neutropenic sepsis

Table 5		
Length of admission	**Number of patients**	**%**
1 - 5 days	25	47
6 - 10 days	10	19
10+ days	15	28
died on ward	2	4
unknown	1	2

The duration of admission varied for this group of patients as detailed in the above table. Two patients died during their admission within the audit period, highlighting the significance of this condition. There is some variability in length of stay reflecting the multifactorial nature of problems in cancer patients' admissions such as those patients with advanced disease.

6. Results against audit standards

Standard 1: **Patients who have suspected neutropenic sepsis should have their first dose of antibiotics within 1 hour of entering the hospital.**

The key audit standard was to assess compliance with the 1-hour door-to-needle time for first-dose of antibiotics. This standard was only met in 15% out of a target of 100% cases. The raw data does not provide detail on the possible causes for this level of compliance, however based on informal feedback from those involved in the care of these patients outside of this audit, it is postulated that lack of recognition of the time-dependent nature of this condition, staffing pressures, varying or unpredictable patient workload in acute areas such as the ED, deficiencies in communication and lack of timely access to key medication were all contributing factors.

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Given that many of these patients are admitted outside of the standard working day when medical cover is reduced and that informal feedback suggests that delays in medical assessment and prescription of antibiotics can contribute to failure to meet the one-hour target, consideration could be given to alternative models of delivering this care. A potential solution may be to utilise appropriately trained non-medical practitioners for assessment and management of these patients such as prescription and initiation of antibiotic therapy. It might be useful to incorporate this when commissioning new services particularly Acute Oncology.

Time to first antibiotic dose in patients admitted with Neutropenic sepsis

Table 6.		
Time to first antibiotic dose (hrs)	**Number of patients**	**%**
0 - 1	8	15
1 - 2	15	28
2 - 3	9	17
> 3	20	38
unknown	1	2

Standard 2: **Patients who are within 6 weeks of SACT should have temperature, pulse, BP, RR, O_2 saturations on arrival in hospital and be commenced on an Early Warning Score Chart (EWSC)**

This standard was met in the majority of cases of patients who were subsequently diagnosed with neutropenic sepsis but in almost 30% of patients an early warning score chart was not recorded as having been started.

Initial observations in patients admitted with Neutropenic sepsis

Table 7A		
Initial observations	**Number of patients**	**%**
Temp.	53	100
Pulse	52	98
BP	53	100
O2 Sats	53	100
AVPU	46	87
EWS	38	72

Data on observations completed on patients who were admitted for treatment of a complication of SACT other than neutropenic sepsis are available from the Belfast, Northern, Southern and South-Eastern Trusts. One hundred and three patients were admitted; 56 to the Cancer Centre BHSCT, 27 to the NHSCT, 8 to SHSCT and 12 to the SEHSCT.

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Table 7B: Initial observations in patients who were admitted with complication of SACT other than Neutropenic sepsis

Initial observations	Number of patients	%
Temp.	101	98
Pulse	100	97
BP	100	97
Sats	97	94

Standard 3: **Patients who have suspected neutropenic sepsis should have medical assessment to identify potential sources of infection and appropriate investigations as specified in the NICaN guideline**

Most patients had examination of cardiovascular, respiratory and abdominal examinations. Mouth and throat examinations (which can often be sources of infection in patients with neutropenic sepsis), were not recorded in over 25% of patients. Not all patients are recorded as having had a full blood count which is probably a recording error. There was no blood test or infection screen investigation which was recorded as having been performed in all patients but not all tests are necessary for each patient, for example, an MSSU may not be required in asymptomatic patients with negative dipstick urine testing. In future audits a more defined dataset focusing on key investigations would be more useful for purposes of comparison and assessing quality of care.

Table 8: Initial medical assessment in patients who were admitted with Neutropenic sepsis

Initial examination	Number of patients	%
CVS	51	96
Respiratory	51	96
Abdominal	51	96
Mouth	40	75
ENT	29	55
CNS	30	57

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Table 9: Initial investigations (bloods) in patients who were admitted with Neutropenic sepsis

Initial Investigations (bloods)	Number of patients	%
FBC	52	98
U+E	51	96
LFT	48	91
Bone profile	41	77
Coag screen	36	68
CRP	49	92
Glucose	40	75
Arterial blood gas	4	8

Table 10: Initial investigations (infection screen) in patients who were admitted with Neutropenic sepsis

Initial Investigations (infection screen)	Number of patients	%
Blood cultures	40	75
Sputum cultures	13	25
CXR	42	79
Swabs	18	34
MSSU	25	47

Standard 4: **Patients who have neutropenic sepsis should be closely observed during the first 48 hours of admission. This should consist of EWSC monitoring every 30 minutes until stable, then 3 hourly for first 24 hours and then 6 hourly until 48 hours after admission.**

Regular recording of observations and use of EWSC was recorded in all but 1 patient.

Table 11: Adherence to guidelines in first 48hrs in patients who were admitted with neutropenic sepsis

Adherence to guidelines in first 48hrs	Number of patients	%
Regular observations	52	98
EWS chart	53	100

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Standard 5 Patients who have neutropenic sepsis should have appropriate monitoring of antibiotic levels and fluid & electrolyte replacement.

Table 12: Adherence to fluid balance chart guidelines in first 48hrs in patients who were admitted with Neutropenic sepsis

Adherence to guidelines in first 48hrs	Number of patients	%
Fluid balance chart	49	92
Monitoring of Antibiotic levels where required	39/41	96

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Conclusions

During the six-week audit period 53 patients were admitted for treatment of neutropenic sepsis within the network. This equates to an average of 9 admissions each week or 459 each year. A significant proportion of inpatient stays were over 10 days which is clearly a significant health care burden. In addition, the majority of admissions occurred via Emergency Departments and outside of normal working hours which has implications for staff availability and staff training in non-specialist clinical areas.

The key audit standard was to assess compliance with the 1-hour door-to-needle time for first-dose of antibiotics. This standard was only met in 15% out of a target of 100% of cases. Possible reasons for this include lack of recognition of the time-dependent nature of this condition, staffing pressures, varying or unpredictable patient workload in acute areas such as the ED, deficiencies in communication and lack of timely access to key medication were all contributing factors. Reduced time to first-dose of antibiotics is known to improve outcomes and improvements must be made in meeting this standard.

Initial clinical observations and examination were recorded in the majority of patients. It would seem likely that all patients had observations and appropriate examination carried out but that documentation could be improved. Documentation of initial investigations was again less than would be expected with blood cultures recorded in only 75% of patients. The importance of documenting relevant clinical findings and results should be included in staff education and training, bearing in mind that some investigations may not be appropriate for individual patients. The ongoing care of patients during the first 48 hours of admission was compliant with the regional guidelines in the majority of cases.

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Recommendations

- To coordinate and implement this guidance in a structured approach across the region, including disseminating information to community based teams such as out of hours teams, rapid response teams and GP's to increase awareness of this life threatening condition.

- To develop a standardised training programme across the region tailored to the particular educational needs for key groups including ED, acute medical and cancer specialist teams.

- To ensure continued education of health care staff regarding early recognition and appropriate management of neutropenic sepsis, building this into induction and other training programmes.

- To consider the development of novel or additional patient education tools.

- To ensure the appropriate antimicrobial agents for treatment of neutropenic sepsis are kept as stock items in all relevant clinical areas.

- To consider the development of Patient Group Directives to allow appropriately trained non-medical practitioners to prescribe and administer antibiotics under protocol avoiding potential delay in waiting for medical cover out of hours.

- To develop an integrated care pathway for management of neutropenic sepsis within each Trust (see Post Audit Development section below)

- To perform re-audit after these measures have been implemented focusing on specific areas of concern with particular emphasis on time to first-dose antibiotics

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Post Audit Developments

Development and Implementation of Neutropenic Sepsis Care Pathway within BHSCT and planned implementation across the Network

After initial analysis of the results of the regional audit within the BHSCT and the recognition that some aspects of care were not meeting the regional guidelines, a multi-professional group was established to develop an integrated care pathway for patients admitted with suspected neutropenic sepsis. The project group was established under the leadership of Dr Scullin supported by the General Manager, Cancer Services, the Care Pathways Coordinator, and the Senior Nurse for Cancer Services. Crucially, the group involved representation from all those disciplines and speciality areas in which the pathway would be utilised including Oncology, Haematology, General Medicine and the Emergency Departments. The Care Pathway was tested and refined, and is used in most areas within the Trust. The Care Pathway has also been incorporated into the training and induction programmes in these areas. Work is ongoing to roll this out into full use within the inpatient haematology unit in BCH.

A re-audit over a 2-week period has shown an improvement in the 1-hour door-to-needle time for first-dose of antibiotics of 62%. The Neutropenic Sepsis Patient Care Pathway is in Appendix 2.

Subsequently the Neutropenic Sepsis Patient Care Pathway was presented at the Regional Acute Oncology Steering Groups for consideration of rollout across the network.

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Appendix 1

Management of Neutropenic Sepsis in Oncology and Haematology adults receiving SACT 1St June-12 July2011.final

Hospital number BPR / or H&C…….

Hospital/Unit…….

Cancer Diagnosis …….

Indicate the patient Specialty

- oncology
- haematology

Unscheduled admission via:

- Emergency Department
- Outpatients Department
- BWS / Day chemotherapy unit
- Direct to ward / ward …….
- Other

  Date and time of above …….

- Patient currently an Inpatient (Inpatient prior to development of suspected neutropenic sepsis) Admission date……..

Was a helpline / unit contacted prior to admission

- Yes / advice given……..
- No
- Don't know

Time medical staff contacted to see patient …….

Time oncology / haematology medical staff contacted…….

Currently an Inpatient that has developed suspected neutropenic sepsis

- Inpatient ward / state ward …….

  Date and time suspected neutropenic sepsis ……..

Currently receiving chemotherapy in the past 6 weeks.

- Yes
- No If no reason for admission _____

Chemo regime …….. Cycle no……. Date of last cycle ……

Number of days post last chemotherapy ……

Does the patient have a central line?

- yes
- no

  If yes what type ……..

Is patient on a clinical trial?

- Yes, if yes name trial ……
- No

Time from arrival to assessment ……..

INITIAL ASSESSMENT ON ADMISSION OR INPATIENT DEVELOPED SUSPECTED NEUTROPENIC SEPSIS

INITIAL ASSESSMENT:

Observation	Yes	No	N/A	Date and Time
Temperature				
BP				

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Pulse				
Oxygen saturation				
AVPU				
Ews Score _____				

SECONDARY ASSESSMENT /MEDICAL ASSESSMENT (signs of infection):

Examination	yes	No	N/A	Date and Time
Cardiovascular system				
Resp				
Abdomen				
mouth				
ENT				
CNS				
VAD central line				
Bowels				
Urinary				

INVESTIGATIONS

Blood Tests	Yes	No	N/A	Date and Time
FBC				
U+E				
LFT				
Bone				
Coag				
CRP				

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Glucose				
ABG				
Urinalysis MSSU/CSU				
Stool samples				

Septic Screen Blood cultures peripheral	yes	no	N/A	Date and time
Blood cultures central				
Sputum C+S				
Chest x-ray				
swabs				

INITIAL TREATMENT:

	Yes	No	N/A	Date and Time
IV access				
Oxygen commenced				
1st line antibiotics prescribed				
1st line antibiotics given				
IV fluid commenced				
GCSF commenced				

What antibiotic regime was given (drugs)

_____

If antibiotics not delivered within one hour from arrival to department/ or suspected symptoms if an inpatient please state number of hour's _____

Was the patient on GCSF prior to suspected neutropenic sepsis / if yes date started _____ date finished_____.

ONGOING CARE (48hrs post-admission):

If unscheduled admission time allocated a bed ……

	Yes	No	N/A	Date and Time
Regular observations				
Every 30 mins until stable				
Regular observations for 24 hrs				
Regular observations for 48 hrs				
Urine output/ Fluid balance chart				
EWS chart				
Antibiotic level monitoring				
Fluid replacement				

If unscheduled admission time allocated a bed _____

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Ward allocated a bed _____

Length of admission ……..days

Patient discharged to

- Home
- Hospice
- Transfer to another hospital
- Death
- Other _____

Comments

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Acute admissions in adults receiving SACT (non-neutropenic sepsis)

Hospital number. BPR / H&C……

Hospital/Unit ……

Indicate the patient Specialty

- Oncology
- Haematology

Cancer Diagnosis ……..

Date and time of presentation

……

Route of admission:

- A+E
- OPD
- BWS / Chemo day unit
- Direct to ward

☐ Other ……..

Is patient on a clinical trial?

☐ Yes, if yes name trial ……..

☐ No

Chemo regime …….. Cycle no……. Date of last cycle ……

Reason for admission

……
……..

INITIAL ASSESSMENT:

Observation	Yes	No	N/A	Date and Time
Temperature				
BP				
Pulse				
Oxygen saturation				
AVPU				
Ews Score _____				

Management

……
……

Length of admission ……..days

Oncology / haematology contacted? Yes No

Time oncology contacted ……..

Integrated Care Pathway for the Management of Oncology/Haematology Adult Patients *(18 yrs and over)* with Suspected Neutropenic Sepsis

Patient

Name: ……..

Ward: ……..... DOB: ..... Hosp H&C

No: …… No: ….....*(or affix label)*

Date: ..... Time of Arrival: ..... Location of 1st Assessment:

..... Oncology/Haematology Consultant:

.....

Patient Attends

Cancer Centre ☐ Antrim Cancer Unit ☐

Ulster Cancer Unit ☐ Altnagelvin Cancer Unit ☐

Craigavon Cancer Unit ☐ Haematology ☐ specify Unit: .....

Allergies

Yes ☐ **No** ☐

Initials: ..... Date: ..... Time: .....

Patient Information

This Integrated Care Pathway is a document detailing the management of adult patients who have presented with suspected Neutropenic Sepsis. It has been agreed and documented as the most common pathway that this care may follow. As an individual your health requirements may vary from those laid out in this pathway, in which case the health professionals will use their judgement to adapt that care accordingly. Any variations from the pathway will be

explained to you. If you do not have a clear understanding of what is going to happen, please ask a member of staff to explain.

Staff Information

This Integrated Care Pathway **MUST** be commenced for:

- Adult cancer patients (18 yrs and over) receiving chemotherapy or having received it within the last 6 weeks who are unwell or febrile.
- Adult patients (18 yrs and over) with neutropenia secondary to known bone marrow failure (e.g. due to a primary haematological disorder) who are unwell or febrile.

The goal is a "door to needle" time of 60 minutes for administration of IV antibiotics.

It replaces all other documentation. ***However if an adult patient remains an inpatient for longer than 24 hours this pathway should be discontinued, filed in the patient's notes and details of care/treatment should be continued in the patient's notes.***

When the adult patient is admitted to the ward Nurses MUST complete the inpatient nursing assessment documentation in conjunction with this pathway.

Initialling the Care Pathway

You should use the initials column to confirm that an intervention has been carried out or an outcome achieved.

If an intervention is not applicable, please tick the N/A box as well as initialling.

Variances: "what is a variance"?

A variance is any non-completion of a planned intervention, e.g. "Consent form ***not*** completed correctly" or an outcome ***not*** achieved, e.g. "Fasting regime ***not*** adhered to". If more than one variance occurs on the same page, they should be documented in numerical order, e.g. **V1, V2, V3 etc.** If several variances occur for the same reason, they should be accorded the same number.

Triage Assessment

Identify: All patients within 6/52 chemotherapy **Assume**: Neutropenic Sepsis until proven otherwise **Observations**: Temp, Pulse, BP, RR, O_2 sats, AVPU **Commence**: Early Warning Score chart

18G IV Access: Blood rapidly to Lab
Blood Cultures, FBC, Coag, U&Es, CRP, Gluc, LFTs, Ca2+, PO4-, Mg2+, Urate

Signature Register

Since you are only required to initial parts of the Care Pathway itself, this page serves as a record of your full signature and thus satisfies medico-legal requirements. Accordingly, all staff using this Pathway ***MUST*** complete their details below.

Name ***(block capitals)***

Designation

Professional

Registration Number

Initials

Full signature

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Abbreviations

ABG

ALP ALT ANC APTT AST AVPU bil
BP BM Ca_2

Coag

Creat CRP CSF CXR ECG EDD eGFR ENT ESR EWS FBC Fib

Arterial Blood Gas

Alkaline Phosphatase Alanine Aminotransferase Absolute Neutrophil Count

Activated Partial Thromboplastin Time
Aspartate Aminotranferase

Alert, Verbal, Pain, Unresponsive

Bilirubin

Blood Pressure Blood Monitoring Calcium Coagulation Creatinine
C-reactive protein Cerebrospinal fluid Chest X-ray Electrocardiogram

Estimated Date of Discharge estimated Glomerular Filtration Rate Ears, Nose and Throat

Erythrocyte Sedimentation Rate

Early Warning Score
Full Blood Count

Fibrinogen

GCSF

GGT Gluc HB HDU ICU INR IV LDH LFTs O_2

OD

MCV Mg_2

MRSA
Na PICC Plts PO_4

PT RR

Sys
U&E WCC

Granulocyte Colony Stimulating Factor

Gamma Glutamyl Transpeptidase

Glucose

Haemoglobin
High Dependency Unit Intensive Care Unit International Normalized Ratio

Intravenous
Lactate Dehydrogenase Liver Function Tests Oxygen

Once Daily

Mean Cell Volume

Magnesium

Methicillin-Resistant Staphylococcus Aureus

Sodium

Peripherally Inserted Central Catheter

Platelets Phosphate Prothrombin Time Respiratory Rate Systolic
Urea and Electrolytes

White Cell Count

Provisional Diagnosis

(To be completed by Triage/Assessing Nurse)

Patient

Name: ……..

Ward: ..... Hosp H&C

No: …… No: …..... *(or affix label)*

Signs of Sepsis

Baseline Observations on Arrival
(MUST be completed)

Altered mental state Yes ☐
No ☐
APVU: ..... BM: .....

Hypoxia (O_2 sats <94%) Yes ☐
No ☐
SpO_2: .....

Shock (Sys BP <90mmHG) Yes ☐
No ☐
BP: .....

Temperature >38 or <36 Yes ☐
No ☐
Temp: ..... Pulse >90 Yes ☐
No ☐
Pulse: ..... RR >20 Yes ☐
No ☐
RR: .....

Weight: ..... kg

EWS: ..... Immediately commence EWS chart.

Observations to be recorded at least every 30 minutes

If Yes to any of the above treat as below:

Patients **MUST** be assessed by Department Doctor **IMMEDIATELY** to optimise haemodynamics and give IV antibiotics.

Treat as Neutropenic Sepsis as outlined in the initial management checklist (page 5). Close monitoring including first line antibiotics, oxygen, aggressive fluid resuscitation and assessment of fluid balance.

If signs of severe sepsis/septic shock at any stage:

- **Early senior opinion sought from Oncology/Haematology Registrar**
- **Consider transfer to HDU/ICU**
- **DO NOT wait for lab confirmation**

If the FBC later confirms the patient is not Neutropenic rationalisation of IV antibiotics can then take place (***neutropenia is ANC <1***).

No Signs of Early Sepsis

Await neutrophil count and other bloods. Reassess need for admission and IV antibiotics. If neutropenic and low grade pyrexia consider admission as patient may deteriorate.

Contact Oncology/Haematology Doctor

(*If patient in Royal Victoria Hospital/Mater Infirmorum Hospital Emergency Department contact Oncology/Haematology registrar through Belfast City Hospital switchboard*)

Doctor contacted: Name: ..... Time: .....

Initials: ..... Date: .....
Time: .....

Initial Assessment

(To be completed by Triage/Assessment Nurse)

IV Access and Bloods

Cannula inserted: Yes ☐ No ☐ inserted by: ..... Insitu:
PICC ☐ Hickman ☐ Portacath ☐

The following blood tests are required in all patients. The FBP must be marked **URGENT ?Neutropenic Sepsis** and sent immediately. The haematology lab should be contacted about its arrival.

Essential Blood Tests

Initials

Time sent

Date

Haematology

FBC

Coag

Biochemistry

Oncology Profile

CRP

Microbiology

Peripheral Blood Cultures

Central Blood Cultures: (***only if central line insitu***) Red lumen
White lumen

Initial Management Checklist

(To be completed by Nurse/Doctor)

Action

Yes

No

Initials

Time

Monitoring

Observations recorded every 30 minutes until stable, thereafter 3 hourly. Commence urine output measurement.

Oxygen

Supplemental oxygen prescribed and administered if sats

<94% (**Note**: If *CO_2 retainer then target saturation is 88-92%*)

Fluid and

Electrolyte Balance

Aggressive fluid resuscitation in dehydration. IV fluids prescribed with electrolyte replacement as required.

Antibiotics

(*MUST also be prescribed on the Karden/ appropriate document AND time given documented*)
Give within 1 hour of arrival. Do not wait for neutrophil count.

First Line: Piperacillin 4g/Tazobactam 500mg IV

Time given: ..... Gentamicin 5mg/kg Time given: .....

+/-Teicoplanin 10mg/kg Time given: ..... (if severe sepsis)

Penicillin Ciprofloxacin 600mg IV Time given: ..... Allergic: (loading dose)

Gentamicin 5mg/kg Time given: ..... Teicoplanin 10mg/kg Time given: .....

If signs of severe sepsis/septic shock at any stage:

Inform Oncology/Haematology Registrar immediately by telephone

Consider referral to HDU/ICU

Medical Assessment

Patient

Name: ……..

Ward: ..... Hosp H&C

No: …… No: ….. *(or affix label)*

Primary Cancer Site:

.....

Chemotherapy Regimen:

.....

Palliative ☐Adjuvant ☐Neo-adjuvant ☐Radical ☐(tick as appropriate)

Start date of last chemotherapy:
.....

Patient taking part in clinical trial: Yes ☐No ☐History of Bone Marrow or Stem Cell Transplant: Yes ☐No ☐

Presenting Complaint/Treatment History (Chemotherapy/Radiotherapy to date)

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Past Medical History (including previous episodes of Neutropenic Sepsis)

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Initials: ..... Date: .....
Time: .....

Medication History

(to be completed by Doctor/Pharmacist)

Initials: ..... Date: ..... Time: ..... Has patient brought own medication with them: Yes ☐No ☐

Patient

Name: ……..

Ward: ..... Hosp H&C

No: …… No: ..... *(or affix label)*

Medication history sourced from: .....

Medication

Pharmacist notes

(*Include over the counter and herbal remedies medication)*

Dose Route Frequency

Initials: ..... Date: ..... Time: .....

Medical Assessment

Examination (assess for clinical evidence of infection)

http:1/intranet.belfasttrust.locai/Policies%20and%20Procedures/Neutropenic%20Sepsis%20-

Include: GeneraVSkin/Lines/CVSIRS/GI/Mouth and ENT/Neuro

Initials: Date: Time:

Diagnosis

Medical Assessment

Please document blood results on page 10

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Management Plan

Admit for treatment of Neutropenic Sepsis and continue care pathway: Yes ☐No ☐ Admit but not confirmed Neutropenic Sepsis (care pathway should be discontinued): Yes ☐ No ☐ Patient discharged: Yes ☐ No ☐ Ongoing antibiotic prescribed as per guidelines (page 2): Yes ☐ No ☐ Chemotherapy medication discontinued: Yes ☐No ☐

EDD: .....

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..... Initial management checklist action continued: Yes ☐No ☐

Initials: ..... Date: .....
Time: .....

Date

Reason for Variances

Action Taken ***(If any)***

Initials

Investigations

Patient

Name: ……..

Ward: ..... Hosp H&C

No: …….. No: …..... *(or affix label)*

Summary of blood results

	Cultures (***Culture any symptomatic site if appropriate***)
Date	
Date sent	
Time	
Time sent	
Initials	
Initials	

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HB

Urine

WCC

Sputum

ANC

Stool

Plts

Throat Swabs

PT

Other: specify below
APTT

Fib

INR

Na

http:1/intranet.belfasttrust.locai/Policies%20and%20Procedures/Neutropenic%20Sepsis%20-

K

Urea

Creat

ECG

eGFR

Chest Xray

Ca

Other investigations required: specify below
Phos

Mg

bil

Albumin

AST

ALT

GGT

ALP

LDH

CRP

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Multidisciplinary Notes

Patient

Name: ……

Ward: ……

Hasp H&C

No: No: …… *(or affix label)*

Date and Time

Notes

Initials

Please note if the patient remains in hospital after 24 hours please document in patient notes. Care should continue in line with the Neutropenic Sepsis Policy with particular reference to ongoing close monitoring of observations, fluid balance and antibiotic levels (accessible from %20Regionai%20Guidelines%20for%20the%20Management%20of.pdf)

Multidisciplinary Notes

Date and Time

Notes

Initials