

An electronic-MASCC score to aid discharge decisions of patients with neutropenic sepsis

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Background

- Neutropenic sepsis is a **life-threatening complication** of systemic anti-cancer therapy
- Diagnosis of neutropenic sepsis:
 - Patient having anti-cancer treatment whose neutrophil count is 0.5×10^9 per litre or lower and who have either:
 - a temperature higher than 38°C **or**
 - other signs or symptoms consistent with clinically significant sepsis
- For management, most consensus guidelines recommend **admission** and empirical broad spectrum intravenous antibiotics

Background

- Several **clinical prediction rules** have been developed for the identification of cancer patients with low risk neutropenic sepsis
- NICE recommend the use of a **validated risk scoring system** to assess patient's risk of septic complications
 - within **24 hours** of presentation to secondary or tertiary care
- Patients at **low risk of septic complications** can be managed as outpatient with oral antibiotic therapy
 - taking into account patient's social and clinical circumstances

MASCC Risk Index Score



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ORIGINAL REPORT

The Multinational Association for Supportive Care in Cancer Risk Index: A Multinational Scoring System for Identifying Low-Risk Febrile Neutropenic Cancer Patients

Jean Klastersky, Marianne Paesmans, Edward B. Rubenstein, Michael Boyer, Linda Elting, Ronald Feld, James Gallagher, Jorn Herrstedt, Bernardo Rapoport, Kenneth Rolston, James Talcott, for the Study Section on Infections of Multinational Association for Supportive Care in Cancer

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MASCC Score

Characteristic	Score
Burden of illness: ¹	
• No or mild symptoms	5
• Moderate symptoms	3
• Severe symptoms	0
No hypotension	5
No chronic obstructive pulmonary disease	4
Solid tumour or haematological malignancy with no previous fungal infection	4
No dehydration requiring parenteral fluids	3
Outpatient at presentation	3
Age <60 years	2

A score of ≥ 21 is considered low risk and a score of < 21 as high risk

(positive predictive value of 91%)

¹Only one score for this characteristic (5, 3 or 0 – points are not cumulative).
 A score of 21 or more points is predictive of low-risk febrile neutropenia.

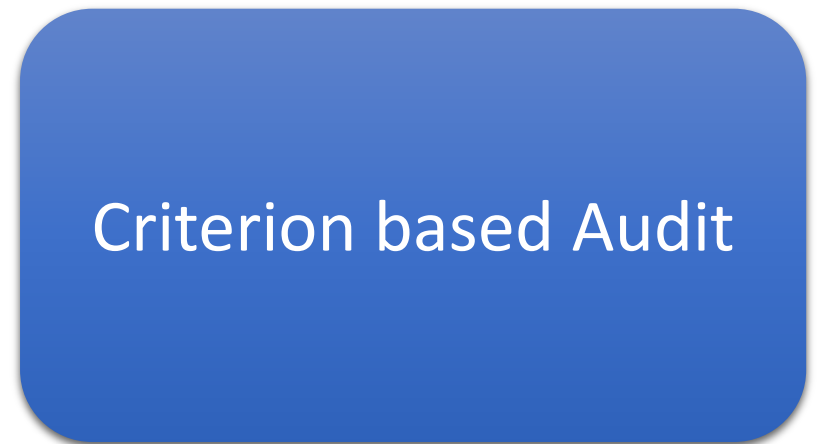
QIP Aims

- To audit the use of MASCC score in all patients diagnosed with neutropenic sepsis over a three month period
- To devise an electronic MASCC scoring system and assess its feasibility to increase the use of the score to a target of 100%
- To assess whether this risk assessment would lead to an earlier and safe discharge of low risk neutropenic patients

Action Planning

What are we trying to accomplish?	By December 2016, our aim was that: - 100% of neutropenic patients assessed using the MASCC score within 24 hours of diagnosis
How will we know that a change is an improvement?	Potential and actual reduction in the time to oral antibiotics and the length of stay
What changes can we make that will result in improvement?	<ul style="list-style-type: none">- Education- Electronic implementation of the scoring system

QI Tools



PDSA cycle



Methods – P&D

- Patients with confirmed diagnosis of neutropenic sepsis were identified over a period of 3 months – September to November 2016
- Data collected: patients' demographics, primary malignancy diagnosis, length of stay, whether a risk assessment was performed for neutropenic sepsis and any other social or clinical circumstances

Methods – P&D

- An excel sheet with an embedded MASCC score was devised to calculate the actual score
- The excel sheet was used to calculate the actual MASCC score in addition to collecting other audit data
- The outcome to be measured was the total increase in the use of MASCC score

MASCC score in excel sheet

MASCC score				
		Yes	No	Score
3	Does the patient have a solid tumour or lymphoma (except Burkitts)?		4	0
4	Is the patient dehydrated or requiring IV fluids?		0	3
5	Is the systolic BP <90 mmHg?		0	5
6	How sick is the patient now?	No or mild symptoms (events barely noticeable, not interfering with	5	0
7		uncomfortable or events influence	3	0
8		and/or performance of daily activities	0	0
9	Is the patient <60 years old		2	0
10	Does the patient have COPD?		0	4
11	Did the patient develop febrile neutropenia while an inpatient?		0	3
12				
13				Total score =
14				
15				

PDSA cycle

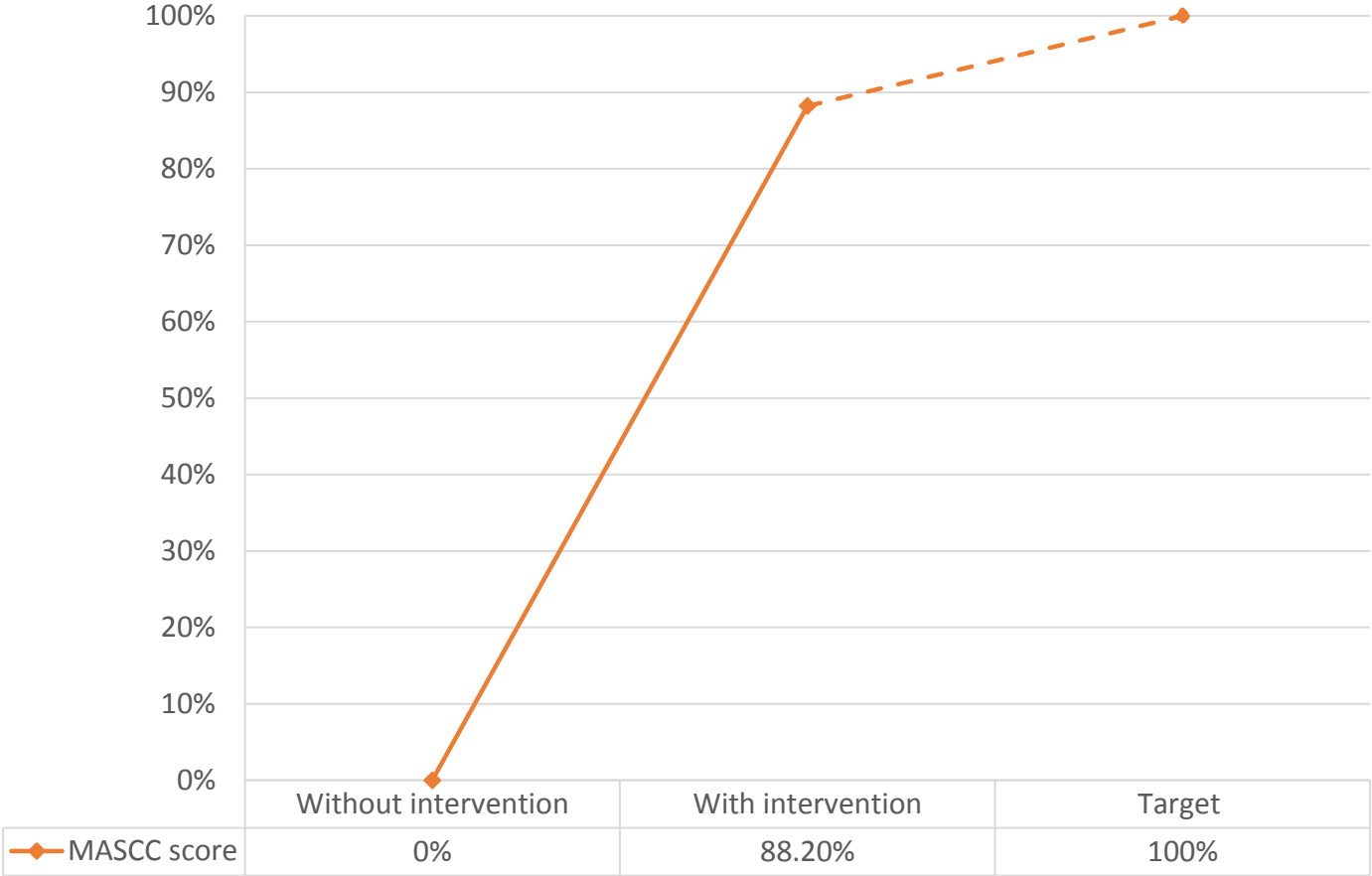


Results – S

- A total of 34 patients with neutropenic sepsis were identified
- **None** of these patients had a risk assessment calculated and documented
- The use of the excel sheet by the QIP team led to 30 patients having a MASCC score within 24 hours from admission or diagnosis
- The mean score for these 30 patients was 20 ± 4 out of 26

Results – S

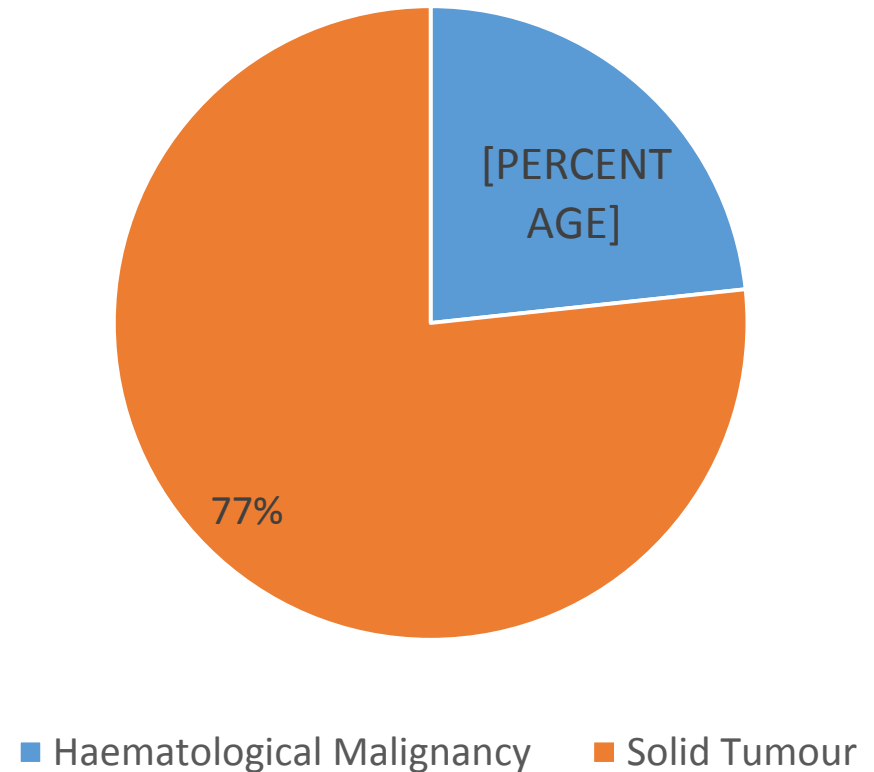
USE OF MASCC SCORE



Results – S

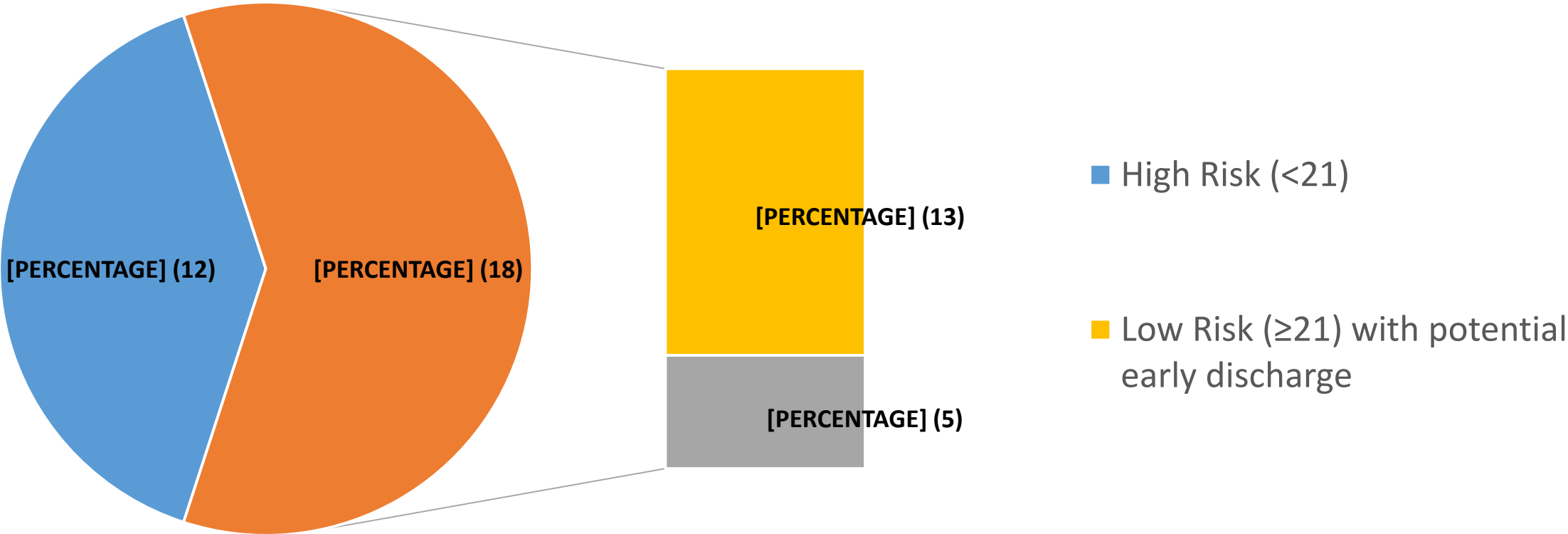
- Mean age of patients = 63.8 ± 12.7 years
- 73.3% (N=22) were female
- Mortality 3.3% (N=1)

Type of Malignancy

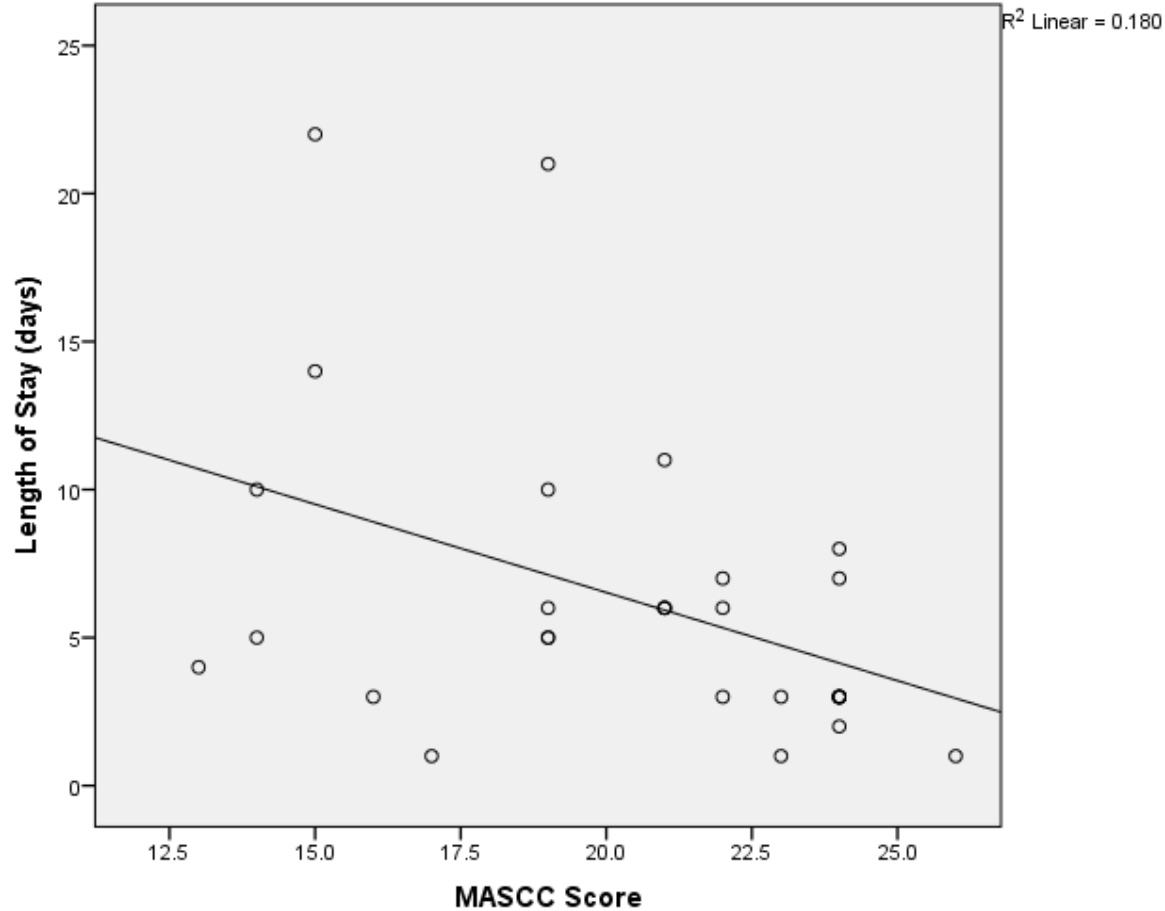


Results – S

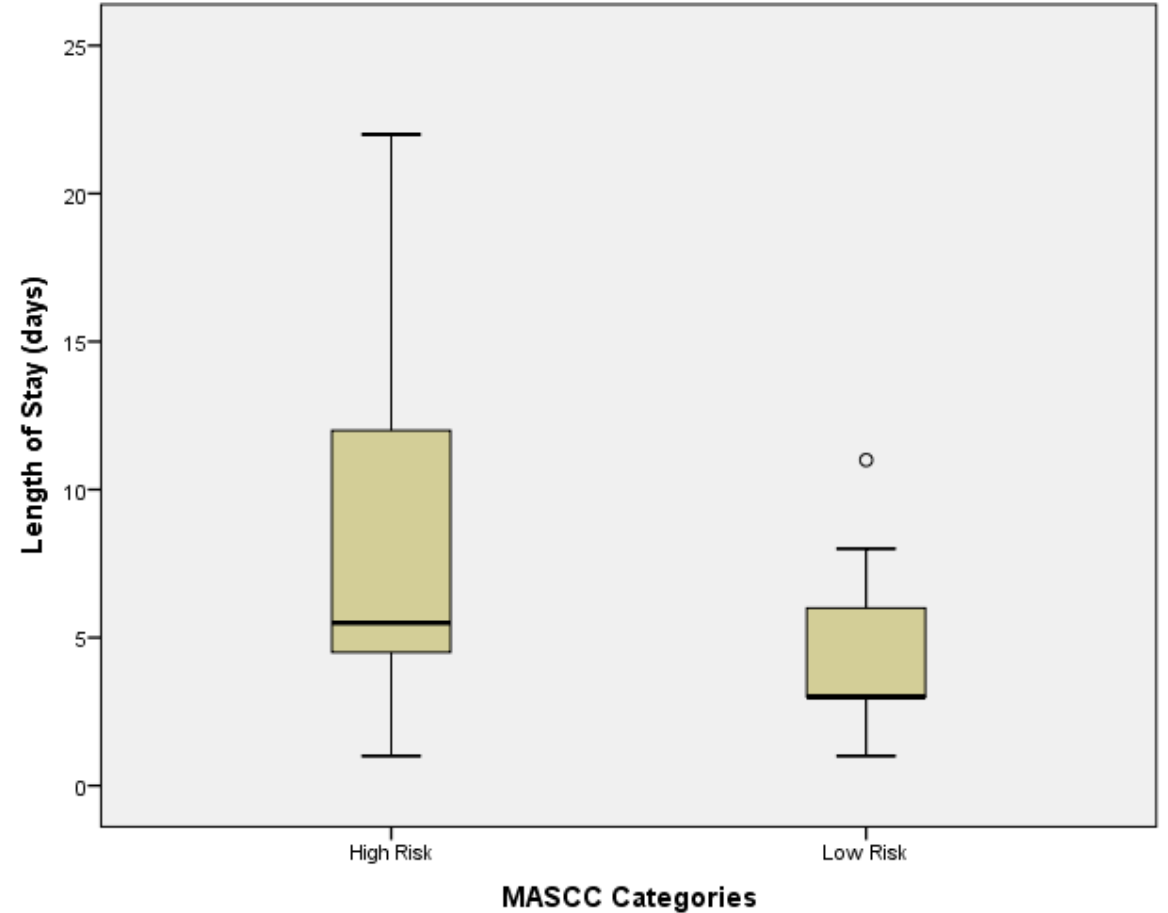
MASCC Risk Index Score



Results – S

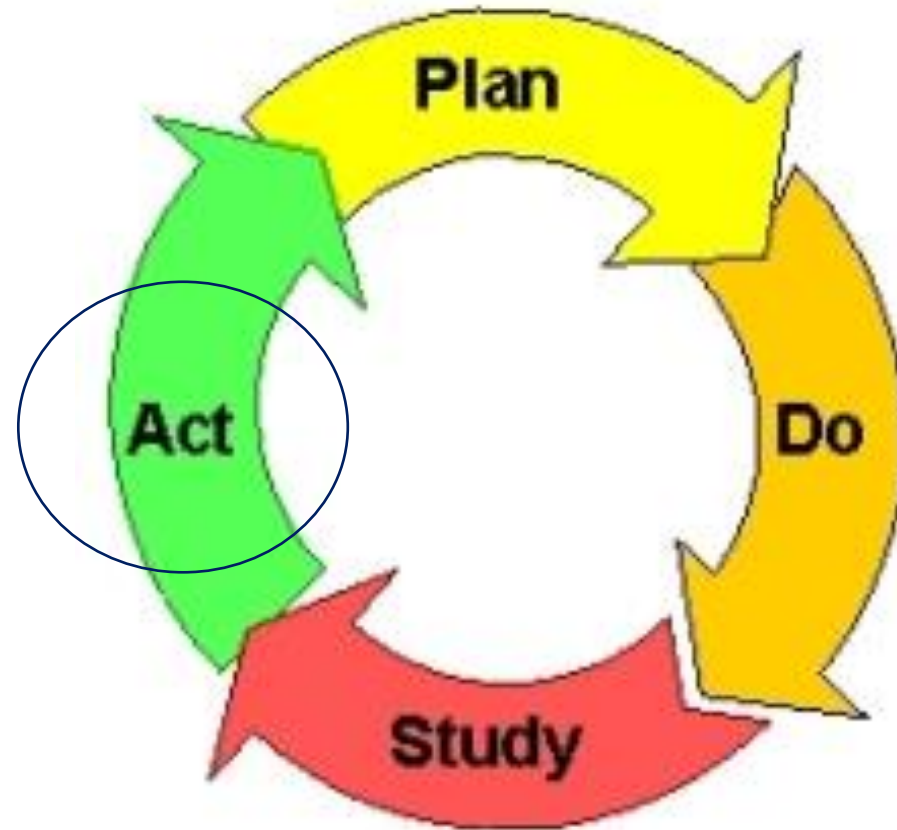


Spearman's rho = -0.442, p value = 0.014



Difference in median length of stay = 2.5 day
(Mann-Whitney U Test, p value = 0.031)

PDSA cycle



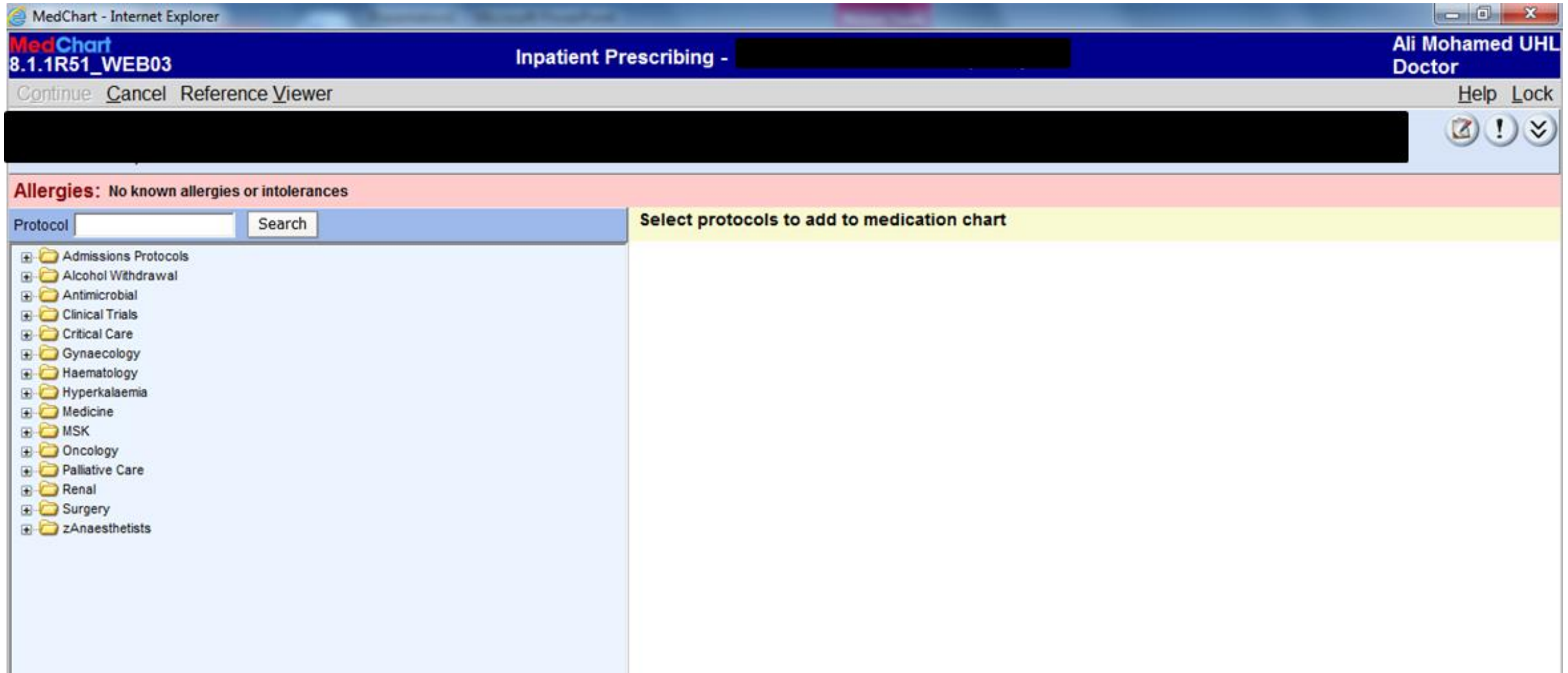
Conclusion - A

- The MASCC score has been **underutilized** in the management of patients with neutropenic sepsis at UHL
- The use of an electronic excel sheet has proven successful in increasing the use of the score (88.2% improvement)
- Some patients in our study could have been discharged earlier and the timely use of MASCC score could have aided this discharge decision

Recommendations – A

- To incorporate an electronic MASCC score system into the existing electronic prescribing medicines administration (ePMA) software
 - This will increase compliance with performing this score at the same time of prescribing the first antimicrobial medication
- Agreed by the head of the service and the ePMA team
- The guidelines for the antimicrobial management of neutropenic sepsis has been updated to reflect this suggestion

eMASCC in ePMA



MedChart - Internet Explorer

MedChart
8.1.1R51_WEB03

Inpatient Prescribing - [REDACTED]

Ali Mohamed UHL
Doctor

Continue Cancel Reference Viewer Help Lock

Allergies: No known allergies or intolerances

Protocol Search

Select protocols to add to medication chart

- + Admissions Protocols
- + Alcohol Withdrawal
- + Antimicrobial
- + Clinical Trials
- + Critical Care
- + Gynaecology
- + Haematology
- + Hyperkalaemia
- + Medicine
- + MSK
- + Oncology
- + Palliative Care
- + Renal
- + Surgery
- + zAnaesthetists

What's next?

- To re-assess the use of the score after incorporating the eMASCC score into the ePMA
- To compare the difference in length of stay between pre- and post-application of the eMASCC score
- To assess patients' satisfaction with early discharge

Learning lessons

- Adherence to **national guidelines** can be improved by simple measures
- The use of **electronic systems** in clinical settings can make a big difference
- **Education** of junior doctors and staff nurses can be a **low-cost and effective way** of achieving an improvement
- The time to implement **recommendations** can be much longer than expected

Acknowledgment

- QIP Team Members:
 - Dr Zohaib Tariq (CT2)
 - Dr Daleep Kumar (CT2)
 - Dr John Villanueva (FY2)

- Supervisors:
 - Dr David Peel (Head of Service)
 - Prof Anne Thomas (Professor of Oncology)

Discussion – Q&A

