# Management of the LOW RISK patient with neutropenic fever

**Risk stratification**

The risk of a patient with neutropenic fever (NF) experiencing medical complications may be assessed using the Multinational Association for supportive Care in Cancer (MASCC) risk index developed by Klastersky et al. The MASCC is a well validated tool that is supported by national and international guidelines fo the management of low-risk NF. This tool can be used to guide the subsequent approach to treatment.

The criteria below need to be fulfilled to be suitable for assessment with the MASCC risk index.

|  |  |  |
| --- | --- | --- |
| **Criteria** | **Eligible** | **Not eligible** |
| Patient is neutropenic ANC of < 1.0 X 109 cells/L | Yes | No |
| Fever of ≥38.3oC OR ≥38.0oC on two occasions | Yes | No |
| Expected duration of neutropenia < 7 days | Yes | No |
| All criteria needs to be fulfilled to continue with MASCC index | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Is patient less than 60 years old? | Yes | 2 | No | 0 |
| Does the patient have a solid tumour OR  Does the patient have a haematology malignancy with no previous fungal infection? | Yes | 4 | No | 0 |
| Does the patient have COPD? | Yes | 0 | No | 4 |
| Was patient an outpatient at time of fever onset? | Outpatient | 3 | Inpatient | 0 |
| Was patient dehydrated at first presentation of NF?  (in the absence of clinical markers of dehydration - assess recent history of oral intake and /or excess fluid losses) | Yes | 0 | No | 3 |
| Was patient hypotensive at first presentation of NF (SBP < 90mmHg)? | Yes | 0 | No | 5 |
| What was the patient’s burden of illness?  (Subjective assessment of symptom severity and physiologic reserve – how sick is the patient now?)  Note: If severe symptoms or moribund, score 0 | None or mild symptoms | 5 | Moderate symptoms | 3 |
| Tallied score for checked boxes (MASCC score) \_\_\_\_\_\_\_\_ | | | | |

**MASCC index**

The maximum value in this system is 26. A score of ≥21 suggests low risk and predicts a <5% risk for severe complications and a very low mortality (<1%) in NF patients.

**Oral Antibiotic switch**

Low risk patients (as deemed by MASCC index, refer above) may be commenced on oral antibiotics at onset or after 24hours if the following criterion is fulfilled and it is the physicians’ preference. At least one dose of oral antibiotics should be given prior to hospital discharge in order to monitor for side effects.

|  |  |
| --- | --- |
| No beta-lactam allergy | Amoxicillin-clavulanate 875/125mg BD  Ciprofloxacin 750mg BD\* |
| Beta-lactam allergy | Clindamycin 450mg TDS  Ciprofloxacin 750mg BD\*  \*dose reduction required with renal impairment, please consult ID |
| Fluoroquinolone allergy | Amoxicillin-clavulanate 875/125mg BD |

Eligibility criteria for oral antibiotics;

|  |  |  |
| --- | --- | --- |
| **Criteria** | **Eligible** | **Not eligible** |
| Stable disease | Yes | No |
| No active infection with multi-resistant organism (MRSA, VRE, Multi-drug resistant gram negative) | Yes | No |
| Patient not on antibiotic prophylaxis (excluding PJP prophylaxis) prior to this admission | Yes | No |
| Able to swallow / tolerate oral antibiotics (≤ grade 2 mucositis and maintaining >50% of dietary intake) | Yes | No |
| Stable mental state^ | Yes | No |
| Normal findings on chest x-ray (if applicable) ^ | Yes | No |
| Haemodynamically stable (SBP≥ 100mmHg, HR 60-100 bpm regularly) ^ | Yes | No |
| Minimal diarrhoea, vomiting, electrolyte imbalance ^ | Yes | No |
| ^ reversible elements  If only reversible criteria are not fulfilled, patient should be re-assessed in 24-48hours.  If all criteria present and physician’s preference is for oral antibiotics, continue to following section | | |

**Early discharge**

Low risk patients who are eligible for oral antibiotics may be discharged to an ambulatory program or with close outpatient monitoring. The patient will require outpatient monitoring until neutrophil count has recovered to ≥1.0 x 109 cells/L.

Eligibility criteria for early discharge;

|  |  |  |
| --- | --- | --- |
| **Criteria** | **Eligible** | **Not eligible** |
| Availability of a 24hour caregiver | Yes | No |
| Good education of patient and carer on reportable symptoms | Yes | No |
| No confirmed focus of infection requiring IV antibiotics | Yes | No |
| Availability of a telephone (with credit) | Yes | No |
| Availability of 24hour phone advice/emergency department review from treating hospital | Yes | No |
| Within 1-hour of an emergency department or treating hospital | Yes | No |
| Suitably resourced follow-up assessment | Yes | No |
| Treating team preference | Yes | No |
| No documented allergy to the required oral antibiotics | Yes | No |
| No previous history of non-compliance with medical care or physical or verbal aggression | Yes | No |
| No previous history of absconding from medical care | Yes | No |

**Ambulatory / Outpatient setting**

Once eligibility for oral antibiotics and early discharge is completed the patient is referred to an ambulatory program with hospital in the home (HITH) or equivalent and follow up in clinic as an outpatient.

Discharge from hospital is likely to be either 24 – 48hrs after admission or discharge without admission (ie. from the Emergency department).

Patient discharge resources should include;

* HITH (or equivalent) appointments
* Pathology slips
* Educational material:
  + home observation and assessment chart with instructions for use
  + reasons for re-admission with hospital personnel contact numbers
  + letter for presentation to an emergency department including description of medical history, recent treatment received and current situation
* Ensure patient has access to a thermometer

**Hospital in the home (or equivalent)**

The following is a recommended schedule for HITH (or equivalent)visits and interventions.

* visits organised for Day 1 and 2 (Day 0 is day of discharge) followed by alternate days until ANC ≥ 1.0 x 109 cells/L (expected that 2 visits will be sufficient)
* interventions to be undertaken during home visit;
  + blood specimens taken (FBE, U&E, CRP, LFT’s)
  + home assessment chart reviewed / discussed (refer to home assessment chart), including temperature, oral intake / hydration, bowel patterns
* patients’ blood results monitored daily by ambulatory care co-ordinator who will liaise with treating team
* patient contacted by telephone by ambulatory care co-ordinator / treating medical officer on Day 3 for a phone review, discuss results, well being and clinic appointment finalised
* patient to return to hospital for a clinic review appointment between Day 5 and 7

**Ambulatory model**

|  |  |  |
| --- | --- | --- |
| **Day** | **Appointments / interventions** | **Responsibility** |
| 0  (day of discharge) | Bloods taken prior to hospital discharge  Follow up Hospital in the home appointments  Educational material / self-assessments (temp / oral intake)  Readmission letter | Treating medical team |
| 1 | Home visit  Blood tests  Wellbeing check, etc | Hospital in the home |
| 2 | Home visit  Blood tests  Wellbeing check, etc | Hospital in the home |
| 3 | Telephone follow up  Blood results discussed | Nurse co-ordinator / Treating medical team |
| 4 | Home visit if ANC <1.0 | Hospital in the Home |
| 5-7 | Attend NF ambulatory care clinic | Nurse co-ordinator / Treating medical team |

**Re-admission**

The following re-admission criteria need to be reported to the appropriate hospital personnel immediately;

- Feeling unwell / new signs and symptoms

- New, recurrent or persistent fever (> 48hrs after discharge)

- Decline in ability to self-care or carer no longer available

- Inability to continue with antibiotics (ie. allergy, vomiting, severe diarrhoea)

- Significant decrease in oral intake (ie. < 50% baseline)

- Positive blood culture result (reported after patient hospital discharge)

Prior to discharge all patients will be educated on reportable symptoms and reason for re-admission (as outlined above).