

There is no place like home: Paediatric low risk febrile neutropenia program tool kit

Instructions for use

In children with cancer and febrile neutropenia (FN) an infection or serious medical complication is documented in less than half of all episodes. The risk of infection or complication may be assessed using a validation clinical decision rule.¹⁻³ Children with low-risk FN may be managed safely at home with oral or intravenous antibiotics provided they meet the home-based care eligibility criteria.⁴ Home-based care of low risk FN has been shown to be safe, improve quality of life and reduce healthcare expenditures.^{1,5-7}

A paediatric low-risk FN program toolkit has been developed by Dr Gabrielle Haeusler in collaboration with the National Centre for Infections in Cancer (NCIC) and the Paediatric Integrated Cancer Service (PICS). This program has been successfully implemented at the Royal Children's Hospital (RCH), Melbourne. In 12 months, a total of 49 children with cancer and FN have been treated on the program which has reduced their length of stay from 3.5 days to <1 day and saved 226 in-hospital bed days. The program was made possible by funding from a Victorian state government grant (Better Care Victoria).

Below you will find instructions for adapting the low-risk FN program documents to your healthcare facility. Documents in this low risk FN program toolkit include:

1. Organisational readiness assessment
2. Policy
3. Patient information sheet
4. Patient readmission letter
5. Home observation chart
6. Staff education slides

For the documents that have [highlighted comments], please insert local information relevant to your healthcare facility.

Please contact Dr Gabrielle Haeusler on gabrielle.haeusler@petermac.org if you have any questions, comments or suggestions for improvement.

1.0 Organisational readiness assessment (ORA)

This ORA template provides a structure for identifying the barriers and enablers to implementing the low risk FN program at your site. It is separated into four domains, including (i) organisation (ii) people (iii) policy and process and (iv) infrastructure, that should be considered prior to and during the implementation phase.

Before completing the ORA, a leadership group should be established that includes key stakeholders involved in the care of children with cancer and FN at your hospital. The stakeholders will likely include medical and nursing representatives from oncology, infectious diseases (ID), hospital in the home (HITH), the emergency department (ED) and bed management, as well as pharmacy and quality improvement. The ORA should be completed in collaboration with the leadership group and updated on a quarterly basis. Areas identified as 'at risk' or 'improvement required' should be discussed and corresponding solutions identified.

2.0 Policy

This policy provides a recommended structure for the low-risk FN program including eligibility checklist, risk stratification, HITH criteria, antibiotic recommendations, daily HITH schedule and discharge and readmission criteria. Please note that the program is only designed for patients with cancer that have received chemotherapy and who have a fever ($>38.0^{\circ}\text{C}$) and neutropenia ($<1.0 \times 10^9/\text{L}$). The policy also outlines key personnel and roles responsible throughout the program. In collaboration with the leadership group, these documents should be update in the [highlighted sections] with details specific to your healthcare facility. It is very important to identify and designate the team/role which will be responsible for daily follow up of patients on the program.

At the RCH, Melbourne, patients are now risk assessed for adverse outcomes using the recalibrated Swiss Paediatric Oncology Group (SPOG) clinical decision rule (CDR). A policy that includes this CDR is available for adaptation. If your local hospital has a different CDR for assessing risk, please substitute your local CDR in the 'other CDR' policy.

The HITH criteria provides a safety net for patients prior to transfer to home-based care. These criteria have been adapted for paediatric use from an adult low-risk FN program and in consultation with paediatric medical and nursing staff at the Royal Children's Hospital, Melbourne. It is recommended that the first 5 points (disease status, disease group, duration of neutropenia, focus of infection and medical complications) are included in your policy. Another important safety net is to ensure your hospital has a clear pathway for patients to reaccess the hospital in the setting of clinical deterioration. The leadership group, in consultation with key stakeholders, should agree on the contact numbers that are provided to the patient and family as well as location for urgent medical reviews (i.e. emergency department, ward, outpatients. Consideration should also be given to afterhours contact and medical review details

Currently the RCH administers IV antibiotics for children on the low-risk FN program as outlined in the policy. Oral antibiotics have also been shown to be safe to use and can be considered, in collaboration with your ID department. Oral options that have been used for low-risk FN include (i) oral amoxicillin-clavulanate PLUS oral ciprofloxacin, (ii) oral amoxicillin-clavulanate and (iii) oral ciprofloxacin

3.0 Patient and carer information sheet

This document explains the project in plain language for families. It also clearly outlines when the patient should represent to hospital as well as provides relevant hospital contact details. These contact details are [highlighted] and should be updated for your hospital. This document has been reviewed and endorsed by the Parent Advisory Committee at Royal Children's Hospital, Melbourne. It is advisable that any changes to this document at your hospital also receive consumer feedback. Consideration could be given to publishing this document in common languages other than English for your facility.

4.0 Patient re-admission letter

In the event that a patient needs to represent to hospital while on the low-risk FN program this letter provides necessary details for the triage nurse and treating clinicians. This is especially important for patients that may represent to a healthcare facility other than their primary treating hospital. It is recommended that patients bring this letter for any emergency department presentations. It should be

updated accordingly with relevant links to your hospitals Febrile Neutropenia and Sepsis guidelines and proved recommendations for first dose antibiotics.

5.0 Home observation chart

This home observation chart should be provided to families prior to transfer to home-based FN care. The chart provides a template for parents/carers to monitor their child's temperature and clinical status. This chart can be reviewed by the HITH nurse and provides prompts when to contact the patients treating team for advice.

6.0 Staff education slides

A set of staff education slides have been provided that should be updated to include your hospital logo, site specific details and relevant contact numbers. For most slides, additional comments and explanations are provided in the notes section. The sections [highlighted in red] should be updated to reflect your local low-risk FN program details.

References

1. Haeusler GM, Thursky KA, Mechinaud F, et al: Predicting Infectious Complications in Children with Cancer: an external validation study. *Br J Cancer* 2017 117:171-178
2. Haeusler GM, Thursky KA, Slavin MA, et al: External Validation of Six Pediatric Fever and Neutropenia Clinical Decision Rules. *Pediatr Infect Dis J* 2018 37:329-335
3. Haeusler GM, Thursky KA, Slavin MA, et al: Risk stratification in children with cancer and febrile neutropenia: a national, prospective, multicentre validation of nine clinical decision rules. *EClinicalMedicine* 2019 18
4. Teh BW, Brown C, Joyce T, et al: Safety and cost benefit of an ambulatory program for patients with low-risk neutropenic fever at an Australian centre. *Support Care Cancer* 2018 26:997-1003
5. Morgan JE, Cleminson J, Atkin K, et al: Systematic review of reduced therapy regimens for children with low risk febrile neutropenia. *Support Care Cancer* 2016 24:2651-60
6. Orme LM, Babl FE, Barnes C, et al: Outpatient versus inpatient IV antibiotic management for pediatric oncology patients with low risk febrile neutropenia: a randomised trial. *Pediatr Blood Cancer* 2014 61:1427-33
7. Teuffel O, Amir E, Alibhai SM, et al: Cost-effectiveness of outpatient management for febrile neutropenia in children with cancer. *Pediatrics* 2011 127:e279-86