PROGRESS REPORT TO AUSTRALIAN LIONS CHILDHOOD CANCER RESEARCH FOUNDATION
PROJECT: NSW/QLD RURAL CHILDHOOD CANCER MANAGEMENT PROGRAM
(IMPROVING THE MANAGEMENT OF THE FEBRILE CHILD WITH CANCER)
Managed by: Kids Cancer Centre
27th August 2014

Funding Initiative:	NSW/QLD RURAL CHILDHOOD CANCER MANAGEMENT PROGRAM (IMPROVING THE MANAGEMENT OF THE FEBRILE CHILD WITH CANCER)
Purpose:	To improve infection management for children diagnosed with cancer treated in a rural setting
Output:	**1.** To assess and audit the current system of infection management used by clinicians in rural and regional centres for child cancer patients. **2.** To devise a new infection management plan for these children
Total amount donated:	$200,000
Total expended:	$200,000
Total period of funding:	3 Years
Reporting period:	Year 1: January 2014 – August 2014
Overall report number:	#2
Study coordination site:	Sydney Children's Hospital, Randwick
Principal Investigator:	Prof. Glenn Marshall (NSW) & A/Prof Andrew Hallahan (QLD)

Protocol Synopsis:

Objectives	Identify the barriers to optimal management of fevers in children with cancer
Study Design	Prospective observational cohort study of all children with cancer who present to a hospital facility in Queensland or New South Wales with a fever with suspected neutropenia.
Outcomes	Neutropenic fevers are the most common emergency in children with cancer, with a risk for rapid progression to septic shock. Children's cancer treatment centres have developed clear guidelines for management of the child presenting with fevers. Optimal care is for the child to be assessed and have antibiotics commenced within one hour of presentation. A retrospective audit of the management of children with cancer who experience fever throughout Queensland identified that this does not occur. In this study we will prospectively collect information on cases of fever in children with cancer and undertake surveys and interviews with staff and families' to identify where barriers to optimal care arise. Once these barriers are understood, interventions can then be developed to reduce or eliminate barriers, thus improving outcomes for patients and families. This project will develop a robust data collection and reporting system that can be sustainably incorporated into 'business as usual' for health services with central tertiary centres, providing advice and support to regional centres. It is hypothesized that this will result in systemic improvements in the management of fevers in children with cancer and thus improve outcomes as well as the patient and family experience.

Study Duration	Three years
Number of subjects	It is anticipated there will be approximately 400 cases of eligible participants each year.
Population	Children aged 0-18 years, with a cancer diagnoses, who are neutropenic (i.e. absolute neutrophil count of $<1x10^9/L$) and present with a fever (temperature >38.5°C on one occasion, or >38°C on two occasions)

Background Information:

Neutropenic fevers are the most common emergency in children with cancer, with a risk for rapid progression to septic shock. Children's cancer treatment centres have developed clear guidelines for management of the child presenting with fevers. Optimal care is for the child to be assessed and have antibiotics commenced within one hour of presentation (Philips et al 2012).
When a child experiences a fever, families are instructed to present to their closest hospital to ensure timely review and commencement of treatment. There is significant variability between and within centres in the evaluation and treatment of the febrile paediatric cancer patient (Chamberlain et al 2005). Variations in the management of central venous access devices have also been identified as contributing factors to delays in treatment. Child and family experience of these management issues have never been evaluated.

A retrospective chart review was conducted for the period from July 1 2009 to June 30, 2011. Following ethics approval, data was obtained from 5 of the 10 regional Queensland hospitals and the Royal Children's Hospital (RCH), Brisbane. Patients had a fever ($\geq 38.5^0C$ x1 or $\geq 38^0C$ x2) and neutropenia (ANC $<1x10^9/L$). The standard management algorithm for the time period recommended rapid assessment and commencement of IV piperacillin/tazobactam and gentamicin. There were 60 episodes of febrile neutropenia, 48 were in patients with leukemia (79%), 13 in patients with solid tumors (21%). Time from presentation to medical review and to the commencement of antibiotics was evaluated.

Table 1. Time for medical review (only assessed in a subset of charts due to documentation)

	Regional (n=19 evaluable)	**RCH Emergency (n=15 evaluable)**	**RCH Onc Day (n=4 evaluable)**
<30 min	5 (26%)	13 (86%)	1 (25%)
30-60 min	9 (48%)	1 (7%)	2 (50%)
>1 hour	5 (26%)	1 (7%)	1 (25%)

Fishers exact test probability (regional vs RCH) = 0.014

Table 2. Time to start antibiotics

	Regional n=24	**RCH Emergency n=28**	**RCH Onc Day n=8**
< 1 hour	3 (12%)	7 (25%)	0
1-2 hours	7 (29%)	16 (57%)	5 (63%)
>2 hours	14 (59%)	5 (18%)	3 (37%)

Fishers exact test probability (regional vs RCH) = 0.023

This study demonstrated that timely review and commencement of intravenous antibiotics in childhood cancer patients with potential neutropenic sepsis cannot be taken for granted. A significant gap exists for:

1. Timely medical review within 30 minutes; achieved only 26% of the time in the regional centres vs 87% of the time in the RCH Emergency Department.
2. Commencement of antibiotics within one hour of presentation; occurred in only 12-25% of patients. For patients in regional Queensland centres this took >2 hours in 59% of cases.
3. The management of central venous access devices between centres; significant inconsistencies were revealed in the review.
4. The experience of children and families between centres. Anecdotally the experience of children and families was also highly variable and potentially suboptimal.

Stages of Research:

Stage 1: Audit Stage – COMMENCED AND ONGOING
Investigation by a senior researcher into the current practices of clinicians across key areas in NSW & QLD to determine what the treatment is for paediatric patients who present to Emergency Departments in peripheral centres with side effects of their cancer treatment.

Stage 2: Implementation Research Stage – COMMENCED AND ONGOING
Once the first year was completed, the second stage would occur, with the creation of a new treatment plan and key practices to occur to help regional doctors provide the appropriate treatment to these patients.

Stage 3: Assessments of Practice Stage
The final year of the research would be focused on assessing whether the new treatment protocols were actually being followed, and to determine their viability on ensuring the best possible care for these critically ill patients. This new treatment protocol would then be rolled out across Australia, and used as a basis for all paediatric cancer patients when presenting to peripheral Hospitals across the country for medical care.

Key outcomes achieved to date:

- Initiation and ethics application completed.
- Initiation and ethics approval of 2 sites in NSW & QLD.
- Project plan is complete.
- Dr Dalla Pozza from CHW has developed a new NSW guideline with the Clinical Excellence Commission at NSW Department of Health to act as a best practice control for the study.
- Detailed Project Protocol completed, approved and in action.
- Rebuttal for first stage of approval with KCA has been approved.
- Second level of approval with Executive Management Group of KCA has occurred. Appointment of Nurse Researcher or a Clinical Research Assistant has occurred in QLD. This role will carry out field work and collate trial data to determine in the first year where the issues lie within the peripheral centres. This role will provide central data management, site initiation and trial monitoring.
- NSW positions to be advertised in August and September 2014 as 2 x 0.5 FTE nurse researchers.
- Trial database construction is complete and online.

- QLD & NSW counterparts have meet and determined allocation of funds within each centre involved in the study, as well as what the best course of action is for the integration of the two sites involved (ie: data collation/communication channels between sites etc).
- Ethics approval has been submitted and approved, several meetings have been held with the QLD collaborators.

Progress Update:

- Detailed job description for NSW role has been written.
- Advertising in the next few weeks now for two 0.5 full time equivalent nurse researchers to work out of CHW and SCH, and, a 1.0 full time equivalent nurse in Brisbane.
- Case Report Form created and distributed.
- Telephone Survey for Care Givers created and distributed.
- Semi-Structured Interview Guide for parents who have agreed to take place in the study has been created and distributed.
- Clinician Information Sheets has been written and distributed across participating centres in QLD.
- Parent Information Sheets has been written and distributed across participating centres in QLD.
- Detailed Study Visits and Procedures Schedule has been created.
- Draft Data Collection Tool has been written and approval process is underway.
- To get this sort of progress in planning across 2 states and 4 institutions has been very difficult for all and three additional teleconferences each week have been taking place to ensure the project continues to flourish and create significant results

Next steps:

- Continue to assess current practices and educate on new protocol's and recruitment procedures
- Finalise NSW & QLD nurse researcher positions and teams
- Continue recruitment and enrolment into the study

The parents, children and clinicians of current and future patients thank the ALCCRF for helping to make this research possible.

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27 August 2014