

Title of Project:**LISA - Leukaemia Intervention Scheduling and Advice**

Decision support for treatment of childhood Acute Lymphoblastic Leukaemia

Principal Investigator:

Joint development between CRUK Paediatric Oncology Unit, The London Hospital (Vaskar Saha) and CRUK Advanced Computation Laboratory (John Fox)

Aim(s) of Project:

1. Develop a web-based computerised decision support application for the shared care of children with Acute Lymphoblastic Leukaemia (ALL);
2. Explore the potential for computerised decision-support systems to improve physician compliance with clinical trial protocols and maximise safety and quality and efficiency.

Please provide a summary of the project (max 1 page):

Treatment of Acute Lymphoblastic Leukaemia (ALL) can be viewed as comprising three phases – the *Induction* of clinical remission, the *Consolidation* of this remission, and subsequent *Continuing Therapy* (often referred to as maintenance therapy). Currently in the UK, over 95% of children diagnosed with ALL are enrolled into the Medical Research Council UKALL 97/01 trial, and hence treatment follows the protocol defined by that trial. In this protocol, Continuing Therapy lasts between 24 months (girls) and 36 months (boys). The mainstay of treatment during this period is the regular administration of two oral chemotherapy agents, 6-mercaptopurine (given daily) and methotrexate (given weekly). There is great individual variation in response to these drugs, and dosages have to be continually adjusted to avoid inducing episodes of severe marrow suppression which would necessitate interruption of treatment to allow marrow recovery.

The potential for computerised decision-support systems to improve physician compliance within clinical trials, as well as supporting safety and efficiency, is well-recognised. However, there has been little progress in realising this potential – largely due to the difficulties of translating promising experimental

systems into routine practice in complex clinical environments. In this project, we have been able to exploit an infrastructure developed to support electronic data gathering to additionally support the deployment of a decision-support system across a large number of institutions. The decision rules are moderately complex and their application requires knowledge not only of a child's most recent blood count but also of blood counts and chemotherapy dosages during the preceding twelve weeks.

The LISA (Leukaemia Intervention Scheduling and Advice) system has includes a centralised database for storing comprehensive data on interventions, scheduling, dosages and side-effects during treatment for all patients, a view of all blood results and dosage decisions made for a given patient during maintenance, and decision support on the appropriate dosages that should be prescribed next based on previous blood results and dose decisions and the current blood result.

LISA's decision support module was built using the *PROforma* decision support technology developed at Cancer Research UK.

More information at <http://www.acl.icnet.uk/lab/lisa.html>

Please list 3 deliverables that the project will contribute to the UK and/or international cancer informatics community

- A web-based computerised decision support application for the shared care of children with Acute Lymphoblastic Leukaemia (ALL);
- Demonstration of the potential for computerised decision-support systems to improve physician compliance with clinical trial protocols.
- Demonstration of the value of *PROforma* in the design and implementation of practical clinical decision support systems.

Please describe how the project will incorporate and/or re-use existing informatics infrastructure and/or resources. If the project will not use any existing infrastructure or resources (e.g data standards or ontologies) please explain why this is the case

- LISA builds on a standard ORACLE database for capturing and storing clinical data
- It uses standard Web tools to deliver services at the point of care

Please describe the plans for the sharing of data and dissemination of knowledge that arise from the project:

- A demonstrator of the LISA system has been developed for public review and is available at www.openclinical.org.
- The LISA results will be published in the open literature

Contact details for liaison person should further information be required:

Christopher Hurt, Advanced Computation Lab, CRUK

Telephone number

020 7269 3128

e-mail address: