

HiruMed 'RAID'

Anticoagulant Management Software

Version 2 for Windows

EASY OF USE

Following the success of version 1 (formally known as 'RAID-Pro') HiruMed 'RAID' version 2 is the ultimate solution for the management of patients receiving oral anticoagulant therapy.

The graphical user interface has been reworked to enhance user operability while reducing the number of screens needed to complete routine tasks.

VERSATILE

The software supports:

- 100 user defineable algorithms for both induction and routine dose control – no separate induction module needed.
- User definable therapeutic ranges by diagnosis - modifiable for an individual patient.
- Unlimited user definable reports.
- Concurrent formal and 'ad hoc' clinic management.
- Intelligent user definable handing of interacting drugs.
- Advanced system warnings with comprehensive audit of operator and system activity.

FAST AND EFFECTIVE

HiruMed 'RAID' version 2 is probably the fastest dosing package available. The introduction of a custom pseudo 'client / server' N-Tier architecture reduces the overall network traffic in a multiple user configuration without the need for expensive server operating systems. An important factor in a busy clinical network environment.

Recent customer initiated comparative studies have show HiruMed 'RAID' to out perform leading competitor products while at the same time reducing manual dose effort.

INTERFACES

Direct 'main line' instrument interfacing using HiruMed 'C-Quel' removes the need for additional host interfaces.

Interfaces are available for POC devices either using direct PC connections or wireless enabled PDAs running Microsoft Pocket PC.

Patient dose enquiry and remote INR result import using wireless enabled PDAs is now available.

SUPERIOR PRODUCTS FOR LESS

HiruMed Ltd
Integer House
Coped Hall Business Park
Wootton Bassett
Swindon SN4 8DP

Telephone: 44(0)1793 854500
Facsimile: 44(0)1793 854440
E-mail: mail@hirumed.co.uk

CONTINUED DEVELOPMENT

HiruMed is committed to the continued development of the product. Our continued investment in new technologies including web / telephone services and Neural Network together with support for new drugs, will ensure that customers continue to

TRAINING

One day operating training is required - usually given over two consecutive half days. Training is supported by 'on line' and printed operator manuals.

SUPPORT

Primary technical support is by telephone, fax and e-mail. If supplied by a distributor, additional software support is available through the distributors own technical support infrastructure.

HARDWARE REQUIREMENTS

The software is installed on a single 'server'. A quick to install service pack is all that is required to create a client.

LICENSING

Our new 'floating' licence policy needs fewer software licences to server a greater number of clients. Unlike some competitor products, we do not operate a restrictive database policy requiring constant additional 'blocks' of patient records to be purchased.

CUSTOMER COMMENTS

European Network on Anticoagulant Treatment (ENAT)

"At the time I was preparing the european recommendations regarding the computer systems for managing anticoagulated patients I took advantage of my recent experience with 'RAID-Pro', and the recommendations were made on the basis of the features already present in the program"

Dr Gualtiero Palareti
President of the Italian Federation of Anticoagulant Clinics.

FINALLY ...

Before making that final product selection or re-newing expensive existing support agreements, give us the opportunity to show how HiruMed 'RAID' could enhance your clinical services while significantly reducing costs.

Warfarin Dosage

Faculty of Applied Computing,
University of Lincoln,
Brayford Pool,
Lincoln,
LN6 7TS

Tel: 01522 886491

Staff: Susan Coulson, Andrew Hunter
Sponsors: EPSRC, [HiruMed Ltd.](#)

Warfarin is an anticoagulant drug i.e. it decreases the tendency of the blood to clot.

In its usual state blood is in a fluid form, circulating around the body and acts as an internal transport medium. Blood clotting is normally a beneficial process, instigated by local injury. It acts to control blood loss and prevent entry of foreign bodies into the system, by creating a temporary seal over a damaged area. However some people are prone to developing unwanted blood clots within the circulatory system, which have the potential to disrupt the body's transport system by blocking a blood vessel.

The consequences of such a clot are dependent on its size, and which blood vessel (if any) that it blocks. In the most severe cases this type of blockage can result in a stroke (interruption of blood supply to part of the brain) or a heart attack (interruption of blood supply to part of the heart muscle). Both of these outcomes vary in severity, but either can be fatal.

Factors that are known to indicate a predisposition to these types of clots, and therefore make warfarin therapy beneficial, include: atrial fibrillation (an abnormal heart condition), previous occurrences of these clots, and the presence of mechanical heart replacement valves. Evidence of its efficacy has resulted in an increase in the number of people for whom the drug is prescribed. It was estimated that 470,000 people in the United Kingdom were taking warfarin in 2001.

While warfarin is a known, effective means of decreasing the risk of clot formation, it can also cause excessive bleeding. To be beneficial the drug must be administered to maintain the patient's clotting tendency within a narrow, pre-defined therapeutic range. The actual range is dependent on the reason for the anticoagulation therapy. Within this range the best balance of the benefits (i.e. prevention of unwanted clots) against the main risks (i.e. bleeding) of warfarin therapy are obtained. The effect of warfarin is monitored by regular blood testing and is reported as the INR (International Normalised Ratio).

It is recognised that either under- or over-anticoagulation can result in a fatal adverse event. Therefore accurate control is very important, but response to warfarin is highly variable and so difficult to predict. A "correct" dose of warfarin is one which results in maintaining an 'in range' INR for the individual patient. Therefore warfarin doses must be individually determined for each patient, and may be changed during the course of treatment.

Warfarin has a complex dose-response relationship, partly due to its relatively long half-life (36-42 hours), differing responses in individual patients, and the large number of contributory factors. These factors are thought to include certain concurrent illnesses, some medications, diet, alcohol intake, age, gender, and ethnic origin.

Thus determination of warfarin dosing is a hard task, requiring much knowledge and experience. There is evidence that computerisation of this type of task can result in improved INR control, but current systems are limited in the range of patients that they can successfully dose.

In this project we are examining the use of neural networks and related modelling techniques to improve prediction and control of INR in warfarin patients. The implications of embedding these techniques in an automated dosing advice system ([HiruMed 'RAID'](#)) will also be considered.

Neural networks are especially suited to this type of problem as they are able to model complex relationships, and 'learn' these from previous data. However in the medical domain the rationale for a decision is important, but neural networks are generally regarded to have low interpretability. Therefore to be successful the system must not only correctly determine warfarin doses, but also give indications of why they are appropriate.

SUPERIOR PRODUCTS FOR LESS

HiruMed Ltd
Integer House
Coped Hall Business Park
Wootton Bassett
Swindon SN4 8DP

Telephone: 44(0)1793 854500
Facsimile: 44(0)1793 855440
E-mail: mail@hirumed.co.uk