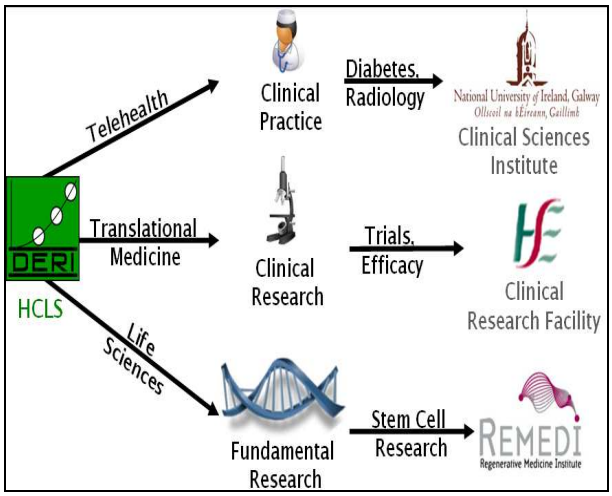
DERI GALWAY

National University of Ireland, Galway
Ollscoil na hÉireann, Gaillimh

Healthcare and Life Sciences (HCLS) in DERI

Overview

Within healthcare there are three layers which form the integral process of delivering care to patients also known as the "bench to bedside" process of drug research and development. At the bottom layer fundamental research into Life Sciences investigates the impact, at molecular level, of diseases on the body. Drugs are then developed which are brought to clinical trial resulting in a discipline known as Translational Medicine where the impact of the drug is determined and fed back into the research process. Clinical Practice involves the treatment of the patient by a clinician. The figure below illustrates the areas on which the HCLS group will focus.



HCLS in DERI

Objectives

The focus of the HCLS group in DERI is on the "bench-to-bedside" process of drug research and development. It will focus on Life Sciences as part of fundamental research, Translational Medicine in Clinical Research, and Telehealth as part of Clinical Practice. The overarching objective is reducing the cost associated with the drug research and delivery process, raising the efficiency of clinical research through data integration, and enabling the self-management of disease by the patient through telehealth.

Telehealth in DERI

Telehealth: €152M in 52 research projects in within European Framework Programs.

So, why aren't all of our outpatients being monitored?

Answers:

- Complexity
- Cost
- Proprietary Solutions
- Payer Confusion (Who Pays?)

This research will focus on the following:

- The provision of infrastructure to open the Patient Area Network (PAN) to competition and thus reduce the costs associated with the remote monitoring of patients
- The provision of infrastructure to provide remotely gathered patient data to clinicians using clinical standards.
- The provision of infrastructure which will scale to the thousands, and, in some environments millions, of patients who will avail of telehealth in the future
- The provision of secure infrastructure which accounts for the ownership of patient data, the privacy and dignity of the patient, and which allows the patient play a part in managing his/her chronic illness.
- The provision of infrastructure which will enable potential payers gain visibility to what they are paying for.

The ultimate vision for telehealth in DERI is aligned with the strategies being considered by governments around the world – that of team-based primary healthcare. It has been found that central components of emerging healthcare models are:

- The continuous follow-up of patients in a home setting.
- Shared care by multidisciplinary teams of professionals from all healthcare levels as appropriate to a patient need.
- Patient empowerment through the adoption of self-management skills
- Tailoring of the healthcare processes to individual patient needs.

Translational Medicine and Life Sciences in DERI

It takes on average 15 years and more than $1 Billion for a drug to make it to market.

Why does it take so long and why is it so expensive?

Answers:

- The volume of Clinical Research and Clinical Practice information.
- No scalable, flexible solutions to enable researchers link genomic data to Electronic Healthcare Records (EHRs).
- No semantic integration of data sets relating to individual patients.
- No feedback loop so that drug experiences (both negative and positive) can be fed back into the drug research and development process.
- The difficulty in finding and then recruiting patients for clinical trials.
- No standards crossing over Clinical Research and Practice.

This research will focus on the following:

- The provision of scalable infrastructure which will enable the integration of Clinical Research and Clinical Practice based on observations of patient data taken at the genomic level.
- The provision of infrastructure to enable the continual feedback of patient reactions to drugs to speed up the drug development process.
- The provision of infrastructure and establishment of semantic methods to enable the adaptable, robust, and scalable methods to aid in the efficient recruitment of patients for Clinical Trials.
- The development of standards, or modifications to existing standards within Clinical Practice and Clinical Research to allow them to interoperate more naturally.

There is great value in being able to work with clinical research data and clinical care data across clinical domains, e.g. health care, pharmaceutical development, pharmcosurveillance. This includes the need to re-use patient data generated from the patient/physician interaction, from Electronic Patient Records (EPRs), as data collection points in a clinical research protocol. Although there is significant overlap in the clinical data collected in clinical research and that collected in clinical care, the different emerging standard data representations do not take this overlap into consideration. Therefore, data use and interoperability across domains remains a significant challenge. Clinical research data and clinical care data from EPRs have different information models and different terminological standards. The goal of this research is to investigate, and if possible propose, a model that enables the re-use of common observation models across the clinical trials and clinical practice contexts. This investigation will include the use of Semantic Web specifications and technologies. This research focus will align itself with research underway in the W3C Healthcare & Life Sciences (HCLSIG).

Current HCLS Activities in DERI

PPEPR:
DERI has created a project with Enterprise Ireland to develop software that enables Plug and Play Electronic Patient Records (PPEPR). Through the application of semantics we are well on the way towards enabling such a vision. PPEPR will find significant application in our vision for Telehealth. PPEPR is funded as SAOR under project number CFTD 2005 INF 224.

RIDE:
RIDE is a 6th European Framework Program project for interoperability of eHealth systems leading to recommendations for actions and to preparatory actions at the European level. This roadmap will prepare the ground for future actions as envisioned in the action plan of the eHealth Communication COM 356 by coordinating various efforts on eHealth interoperability in member states and the associated states. DERI is collaborating with eight other research organisations as part of this project which has provided with excellent insight into the interoperability issues within healthcare.

Collaboration Opportunities

Students:
DERI is embarking on an exciting new road of discovery – new concepts and techniques leading to the development of industry-leading tools. This is an exciting opportunity to join a organisation which has shown the way in semantics over the last 5 years, and will continue to drive into the future where healthcare and society will benefit from our unique combination of talents, expertise, and experience.

Research Organisations:
DERI is always open to collaboration with other research organisations. It is through such collaborations that DERI will continue to excel, through experiencing others' points of view, research interests, expertise, and experience. We have found that such collaborations have served to strengthen DERI and have added significant value to the collaborating research organisations.

Commercial:
DERI and its commercial partners have gained much mutual benefit through collaboration. We continue to seek out commercial partners who can join with us in the exploration of unique and novel technologies in the application of semantics in healthcare.

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