DIABETES SIMULATION MODELS AS PROGNOSTIC TOOLS

15 September 2014, from 2pm to 6pm

PROGRAMME

2:00-2:40pm

Using Risk Equations to Prioritize Diabetes-Related Clinical Recommendations at the Point of Care: Current Status and Opportunities for Improvement

Dr Patrick J. O'Connor

Senior Clinical Investigator, HealthPartners Institute for Education and Research

Co-Director, HealthPartners Center for Chronic Care Innovation, USA

We currently use version 3 of an EMR-linked web-based clinical decision support (CDS) system to identify and prioritize clinical actions designed to minimize risk of major CV events in adults with and without diabetes. This CDS system (referred to as "CV Wizard") was developed using NIH funding and has been shown in a randomized trial to significantly improve glucose control and some aspects of BP control in adults with diabetes (O'Connor et al, Ann Fam Med 2011;9:12-21; Gilmer et al, HSR 2012). The CDS system is currently used at >75% of targeted visits, enjoys a 94% satisfaction rating from primary care providers, and now includes a patient interface to inform patient treatment decisions and efficiently elicit patient treatment preferences. After demonstrating the use of this CDS system, we will discuss the very important limitations of the currently used risk engines that are at the heart of the CDS system, and describe risk-prediction innovations that would improve the performance of future versions of point-of-care CDS systems.

2:40-3:20pm

Current challenges in the health-economic modelling of diabetes

Dr Christian Asseburg

Technical Director, ESiOR Oy, Kuopio, Finland

This presentation summarizes the rationale for the health-economic modelling of diabetes and highlights some of the current challenges including risk equations, treatment choices and the validation of health-economic modelling of diabetes. The ECHO-T2DM model will be used to illustrate the key concepts suited to an interdisciplinary audience. Ideas about how to make better use of individual patient data in the health-economic modelling of diabetes will be also discussed.

3:20-4:00pm

Understanding drivers of cost effectiveness; a case study using the IMS CORE diabetes model

Dr Phil McEwan

Technical Director, Swansea Centre for Health Economics, Swansea University, UK

Diabetes is a complex chronic disease and therefore even the most parsimonious diabetes model is invariably complicated. Despite attempts to openly validate and examine these models it is often unclear to their users which model parameters and assumptions are most influential.

Therefore, the objective of this presentation will be to illustrate how the following specific components interact to drive cost effectiveness predictions in diabetes: (1) Patient characteristics; (2) Diabetes therapy profiles (costs, impact on HbA1C, weight change and hypoglycaemia); (3) Baseline HbA1c and therapy escalation thresholds; (4) HbA1c change over time and (5) Risk of diabetes related complications. The IMS CORE diabetes model will be used to illustrate how these five components interrelate within the model to influence predicted cost effectiveness. A case study involving a 2nd line oral therapy comparison in type 2 diabetes will be presented with particular emphasis upon illustrating why a better understanding of how these models work can improve healthcare decision making.

----------4:00-4:30pm – BREAK----------

4:30-5:10pm
Using the UKPDS Outcomes Model to Inform Clinical Trial Design

Prof Rury Holman
Director, Diabetes Trials Unit, University of Oxford, UK

The UKPDS Outcomes Model is a well-established tool for simulating lifetime outcomes in people with newly-diagnosed or established type 2 diabetes that can also take into account pre-existing diabetic complications where present.

The model has wide applicability as the UKPDS included representative numbers of patients with White Caucasian, Afro-Caribbean and Asian Indian ethnicity. It uses a probabilistic, discrete-time, illness-death approach to determine likely clinical outcomes at yearly intervals for each individual based on their baseline risk factor values. Risk factors considered include age, sex, ethnicity, and duration of known diabetes, height, weight, smoking status, total cholesterol, HDL-cholesterol, systolic blood pressure and HbA1c.

The model can also incorporate observed changes over time in smoking status, total cholesterol, HDL cholesterol, systolic blood pressure and HbA1c. Where these are not available, or where extrapolation over future years is required, the model is able to forecast probable values. Alternatively, likely risk factor levels as might be anticipated in different clinical trial or health scenarios can be imposed.

UKPDS Outcomes Model simulations can be used to estimate macrovascular and microvascular event rates for differing study entry criteria, as well as the likely relative risk reductions that may be realised with interventions though to impact relevant risk factors. Such information can inform the choice of subjects, sample size and study duration.

5:10-5:50pm
Title: TBC

Prof Alastair Gray
Director, Health Economics Research Centre, NDPH, University of Oxford, UK

This talk will focus on using the UKPDS Outcomes Model for individual prognosis, including the use of life expectancy tables, and similar examples in other disease areas including a prognostic software in breast cancer.