Parallel Short Course 1

SMDM CORE COURSE: INTRODUCTION TO MEDICAL DECISION ANALYSIS (DECISION-ANALYTIC MODELING)

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Course Level: Beginner

Background:
Medical decision making is an essential part of health care. It involves choosing an action after weighing the risks and benefits of the options available to the individual patient or the patient population. While all decisions in health care are made under conditions of uncertainty, the degree of uncertainty depends on the availability, validity, and generalizability of clinical data. Medical decision analysis (or decision-analytic modeling) is a systematic approach to decision making under uncertainty that is used widely in medical decision making, clinical guideline development, and health technology assessment of preventive, diagnostic or therapeutic procedures. It involves combining evidence for different outcomes and from different sources. Outcome parameters may include disease progression, treatment efficacy/effectiveness, safety, quality of life, and individual patient preferences. Sources may include epidemiological studies on the natural history of the disease, randomized clinical trials, observational studies, pharmacoepidemiologic studies, quality of life surveys, risk attitude studies, and others.

Format and Requirements:
This is one of the four core short courses of the permanent SMDM curriculum. The SMDM curriculum is a new initiative of the Society with the goal of having a set of introductory-level core courses in foundational aspects of medical decision making. This effort serves the core mission of the Society to educate its members in key content areas, including decision modeling, cost-effectiveness analysis, the psychology of medical decision making, and shared decision making. This course consists of lectures, interactive group exercises and discussions. Examples of published medical decision analyses will be used to illustrate the fields of application, methodological approaches, results and implications of medical decision analysis. Participants will receive material that goes beyond the course for further self-learning. The intended audience includes researchers from all substance matter fields. This is an introductory course; there are no prerequisites. No laptop is needed. Please bring a simple pocket calculator!

Objectives:
By the end of this course, participants will
1) understand the key concepts and goals of medical decision analysis,
2) know the basic methods of decision tree analysis and Markov modeling and be able to choose the appropriate model type for a given research question
3) understand why and when decision-analytic modeling should be used in clinical evaluation, and
4) be able to critically judge the conclusions derived from a decision-analytic model and know the strengths and limitations and of modeling

Course Description:
This half day course provides an introduction into medical decision analysis a tool for clinical evaluation, benefit-harm analysis and medical decision making. During the course, participants will develop a basic understanding of:

- Key concepts, definitions and goals of medical decision analysis
- Creating the structure of a decision-analytic model
- Measuring benefits, harms, and patient preferences
- Application of modeling techniques such as decision trees and Markov models
- Perform a medical decision analysis with uncertainty/sensitivity analyses
- Translate the results from decision analysis into medical decision making and clinical guidelines

Using practical examples, participants will be guided through the main modeling steps. Examples from the published literature will be discussed to understand the application of modeling techniques to specific decision problems and research questions. Modeling recommendations of the ISPOR-SMDM Joint Modeling Good Research Practices Task Force will be presented to allow participants assessing and judging the quality and validity of decision models. Strengths and limitations of medical decision analysis will be discussed at the end of the course.

For introductory reading the following literature is recommended:
Hunink MG, Glasziou PP, Siegel JE, Weeks JC, Pliskin JS, Elstein AS, Weinstein MC. Decision making in health and medicine. Integrating evidence and values. Cambridge: Cambridge University Press, 2001.