

Publication

Personalized cardiovascular medicine : concepts and methodological considerations

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The primary goals of personalized medicine are to optimize diagnostic and treatment strategies by tailoring them to the specific characteristics of an individual patient. In this Review, we summarize basic concepts and methods of personalizing cardiovascular medicine. In-depth characterization of study participants and patients in general practice using standardized methods is a pivotal component of study design in personalized medicine. Standardization and quality assurance of clinical data are similarly important, but in daily practice imprecise definitions of clinical variables can reduce power and introduce bias, which limits the validity of the data obtained as well as their potential clinical applicability. Changes in statistical methods with personalized medicine include a shift from dichotomous outcomes towards continuously measured variables, predictive modelling, and individualized medical decisions, subgroup analyses, and data-mining strategies. A variety of approaches to personalized medicine exist in cardiovascular research and clinical practice that might have the potential to individualize diagnostic and therapeutic procedures. For some of the emerging methods, such as data mining, the most-efficient way to use these tools is not yet fully understood. In addition, the predictive models-although promising-are far from mature, and are likely to be greatly improved by using available large-scale data sets.

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