

Opinion

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Implications of 'Precision Medicine'



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Opinion

The 2015 State of the Union contained a brief reference to the topic of precision medicine. President Obama was referring to the improving ability of care-givers to individualize the treatment of many diseases. Despite the brevity of the message, the development of precision medicine has monumental implications.

An improved understanding of the genetic pathogenesis of disease will:

- a. advance our ability to assess and identify risk preventions;
- b. provide a means to better classify and diagnosis disease;
- c. better target therapy using existing and novel biologically based modalities;
- d. Reduce treatment side effects and make patient monitoring more precise. The President's budget request includes funding to help promote the development of precision medicine, but precision medicine already has large tailwinds at its back. This is due to the promise of improved disease and deformity treatment and prevention.

The precision medicine concept has arisen out of the science of genomics, proteomics, and bioinformatics which are subjects well familiar to bioethicists. The ability to determine the entire genetic sequences of individuals opens the door to the capability of recognizing differences in code that affect human health and form. This new understanding of diseases is revolutionary,

permitting investigators to subdivide diseases such as certain malignancies that were previously lumped together bases on factors such as patient signs and symptoms or similar histopathology appearances.

Each new division of disease could carry a different pathophysiology, set of biochemical markers, and response to various treatment strategies. Thus, patients might have previously all received the same treatment for their disease or perhaps a variety of different treatments. Some of those treatments seemed to work for some patients, but not for others, without any rhyme or reason. However, when subdivided by the relevant genetic differences, it will be possible to perform investigations that will reveal why patients previously thought to all have the identical problem differ in their response to various management strategies. The results will open the door to the individualization of medical care.

Just as with many new vistas in our abilities to control human diseases and deformities, ethical issues arise. This is particularly true with genomic research and care, because new boundaries of patient privacy will need to be drawn. In addition, gene manipulation is a cause for concern by many for both moral and ethical reasons. Precision medicine brings the promise of improving our ability as clinicians to more precisely diagnose, manage, and even prevent human disease. This field also holds limitless opportunities for scientific investigations. It brings similar benefits to each of us as potential patients. We, as health care providers, should recognize, appreciate, and reflect on the implications precision medicine brings.



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