Is It Really Personalized Medicine?

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They call it personalized medicine, genetic testing of the patient to determine the predicted efficacies of an array of alternative pharmaceuticals. Some of these may be more effective and some of these may be metabolized differently. The choice of medicine to administer for everything from cancer to depression is improved if we know beforehand the presence of indicative genetic markers.

Knowing that each person's health history depends only partially on the genetic blueprint carried by that person, I wonder where all this is going. Certainly, improvements in medical treatments should be able to be made as more information about the patient becomes known. But, the presence of certain genes tells only part of the story. Whether those genes are expressed or not is important, and so are the many environmental factors that make life so unpredictable. If Uncle John stepped into a vat of acetone, I think he would probably be treated to counteract its toxic effects no matter what his genome said.

Years ago, there was a group of researchers who placed a lot of faith in the "physiome" project. The hope of this work was that knowing the full genetic complement of a person would completely determine her or his characteristics. But there is a difference, sometimes very large, between the genotype and the phenotype of a person. Each living organism is a product, not only of its genetics, but also its physical, chemical, and biological environments. The present outcome for all living things is a chaotic (in the mathematical sense) result of the entire sum of all past experiences (recently called the "exposome"), and, given what we know about epigenetics, some past experiences of those who predate us.

Personalized medicine certainly is a great catch phrase that captures a lot of attention. But, it seems that patients are only being distributed among smaller queues. Instead of blindly prescribing a few standard drugs to everyone and monitoring the results to see if they have the desired effect, prior genetic testing can now be used to make this less of a trial-and-error medical adventure. This, in itself, is good. But is it really "personalized medicine"? I think not.

My experiences in hospitals, both as a biomedical engineer working there and as the husband of a trauma patient, is that there is little personalized anything in a hospital setting. A hospital is largely a get 'em well factory with sick patients in and (we hope) cured patients out.

Truly personalized medicine will come about when primary care physicians become the central core of medical care. Especially if a long-term relationship has been developed between the physician and the patient, the primary care physician knows much more about the patient, including life style, occupation, health history, and medical preferences than is likely to be known by doctors and nurses in the get 'em well factory. This intimate knowledge needs to be incorporated into the factory routine.

More detail about a patient's genome is useful, but does not, by itself, lead to personalized treatment. Only recognition of the patient as a human being worthy of respect will do this. I have suggested that this respect can come from enhanced involvement by primary care physicians, and this may be a heavy burden for them to bear. What personalized medicine really needs is more primary care physicians and fewer specialists.