A Doctor's Guide to Adding Precision Medicine to Their Office

By Jade Hayden

One of the most common buzzwords in medicine of late is "precision" medicine. The concept has a lot of promise, especially for the treatment of certain forms of cancer.

What is Precision Medicine?

At its basic level, precision medicine is tailoring a treatment to the individual patient. Think about blood and bone marrow transfusions for a moment, and the need to match donor and patient biologically. It is sometimes called "personalized" medicine. That term is no longer popular, but still generally recognized as a synonym.

Precision medicine is taking into account your patient's lifestyle, environment, and genetics in order to choose the right treatment for their condition. The idea is that instead of prescribing the same go-to drug to every individual who presents with, for example, high cholesterol, the doctor would instead look a little deeper and try to choose the best first treatment.

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What are the Challenges?

The development of precision medicine faces three challenges. The first is cost — obviously, it is cheaper to provide the same treatment to millions of patients than several treatments to thousands. Some of the technologies used to determine who should get which treatment, such as detailed genetic sequencing, are expensive. They are not always covered by insurance.
The second challenge is privacy concerns. Protecting an individual's genomic data is valuable, and properly anonymizing data used for studies is an ongoing problem. The process of informed consent for research participants will need to be rigorous.

The third challenge is doctor education. Older family doctors may not know much about molecular genetics, and they may not know how to interpret the results of a test and convey it properly to patients. Doctors and other providers including nurses and physician assistants will need to engage in ongoing professional development to improve their knowledge.

Why Should You Include Precision Medicine in Your Practice?

Given the challenges above, why is it important to include precision medicine? As of right now, precision medicine is still in the early stages. For each patient who is cured of cancer with a targeted treatment, there are many more who die after the treatment fails, and the failures tend not to be publicized as well as the successes. Despite this, there are several reasons why doctors should be moving towards embracing precision medicine:

1. Patients are starting to expect it. Although there are obviously limits to the amount you should be listening to your patients, having at least an understanding of the kind of things they are reading about and now think are possible is important for patient education.
2. General practitioners are going to be key to improving and developing precision medicine. By keeping good records of which treatments work for which types of patient, family doctors will be able to help their own and other practices improve outcomes.
3. Precision medicine can improve outcomes, save money, and reduce the number of follow-up visits. Doing appropriate tests based on a patient's family history can both ensure that high-risk patients are screened *and* reduce unnecessary screening and associated false positives. For example, in the future, we may be able to make personal recommendations on when and how often women should get mammograms, which are notorious for their false positives. Even now, tests are starting to help doctors find which painkillers are going to work well for which patients, reducing trial and error and speeding recovering from injuries. It can even reduce the duration of hospital stays. One study indicates that a practice can save $1,100 to $1,600 per patient per year by doing the right kind of genomic testing.

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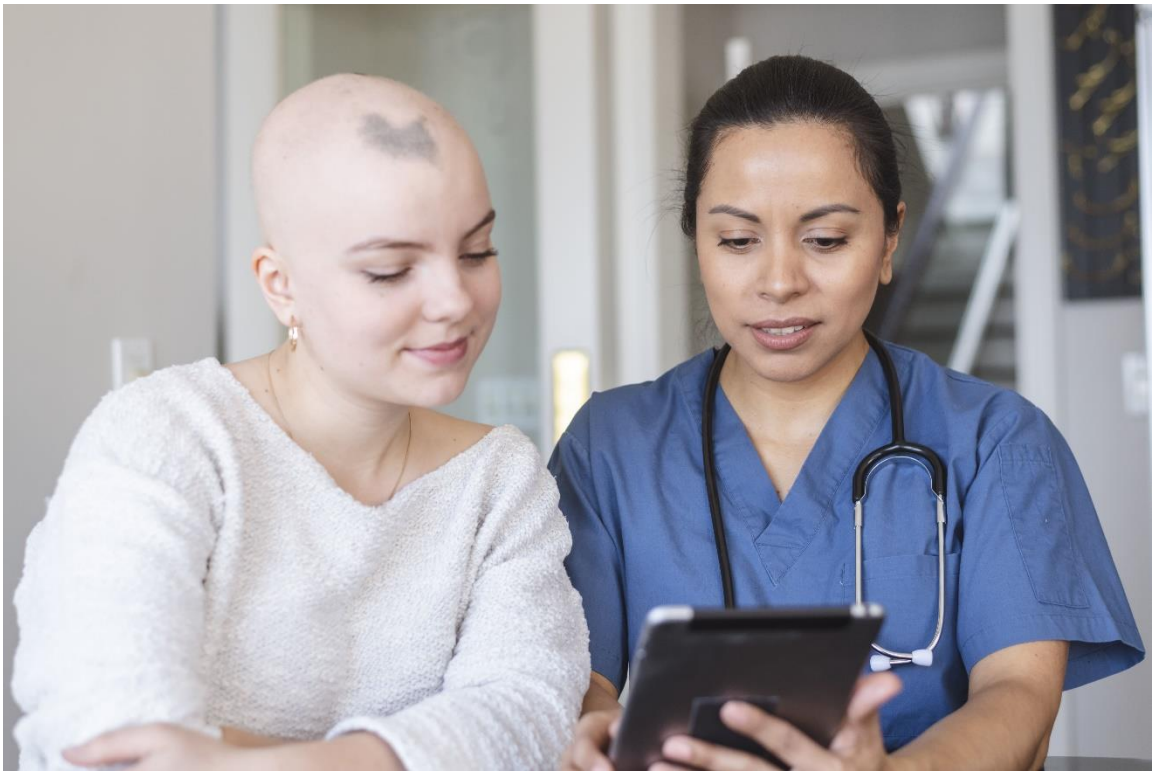
4. In some cases, precision medicine techniques can improve diagnostic accuracy and reduce variations in diagnosis. For example, biomarkers have recently been found that make it much easier to diagnose fibromyalgia. Tracking genetic variances can help both rule in and rule out rarer diseases. As costs come down, it will become much easier for doctors to order a battery of genetic tests when a patient presents with strange or ambiguous symptoms.



For patients, precision medicine can offer several benefits aside from the cancer treatments that are making the news. Here are some examples.

1. A simple six gene panel can determine how you metabolize no less than 55 drugs. This can help doctors determine which painkiller, for example, to prescribe. Studies have shown that this one simple test pays for itself in four months in reduced hospitalizations and emergency-room visits from drug interactions.
2. Precision medicine may be particularly helpful for people who are not European in ancestry. A patient's ethnicity can affect the effectiveness of treatments, as well as the risk of some diseases. For example, African-Americans get skin cancer less often than whites, but when they do, they tend to get a more aggressive variant.

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3. The GeneSight test evaluates how people respond to antidepressant and antipsychotic medications. The test is now helping to reduce the number of psychiatric drugs prescribed. Oddly, the test seemed to improve medication compliance as well, by 17%. It might be that patients are more likely to take prescribed medication if they are more confident that it will work.
4. Genetic testing of microbes can help treat infections. For example, a stubborn bacterial infection can be tested to allow doctors to pick the right antibiotics. Doctors can also identify the type of infection a lot faster.
5. Understanding personal biochemistry can help nutritionists come up with personalized diets. This is not commercial yet but might help people with diabetes by providing them with diets that are designed for their biochemistry and easier to comply with.

How Can You Start Including Precision Medicine?

There are a number of steps you should take to start including precision medicine in your practice.

1. **Professional Development**. The AMA offers a series of online training modules that cover various aspects of genomics and precision medicine, such as prenatal cell-free screening, somatic cancer panel testing, and pharmacogenomics (the study of which drugs work best for people with different genetic variants). Putting yourself and your staff through at least some precision medicine training is going to be essential. There are also other resources to help doctors and patient care professionals learn more about genetic testing, risk assessments, and how genetics are now affecting primary care.
2. **Patient Population Analysis**. The second step is to study your patients. Depending on geography and income, your practice may have demographic variance. The needs of, for example, a mostly elderly community in Florida are quite different from those of a smaller town in the Midwest. Should you be putting resources into testing for hereditable diseases? Cancer screening? Trying to do everything is likely to result in doing nothing well. You also need to consider how most of your patients are paying. Do you have a lot of people on Medicare? How many of your patients are uninsured?
3. **Negotiate with Payers**. Once you have the analysis, then you need to approach insurers and other payers. Insurers are often reluctant to cover the testing needed for precision medicine and they also need to be educated on the value. For example, avoiding unnecessary screening for people who may appear high-risk based off of family history, but who actually escaped the genetic variation causing the risk, can save an insurer a lot of money. Work towards contracts designed to reduce cost and improve outcomes.
4. **Identify Patients**. Identify the patients that will get the most benefit initially. This will give you good outcomes you can then share, and help you bring things into the practice incrementally.

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How Can You Address Patient Concerns?

Many people are seeing the potential of precision medicine. Some patients, however, also have concerns. The primary one is how genetic information may be used. Some patients may be concerned that identifying a gene that places them at high risk for cancer or Type 2 diabetes may affect their ability to get insurance coverage. Those patients need to be reminded that the Genetic Information Nondiscrimination Act has made it illegal to deny coverage or raise premiums based off of genetic tests. Unfortunately, this does not apply to people getting their coverage through Veterans Affairs or the Indian Health Service.

You need to establish a policy for handling genetic information that ensures its security and reassures patients. Genetic information should not be used for research unless properly anonymized. You should constantly be working to ensure that the privacy of all patient information, whilst making it available to, for example, the hospital ER.

For patients who are concerned about precision medicine, it is worth talking about how it has been used in the past. At the same time, you should make sure that patients are aware of the limitations of precision techniques and the fact that it is still a very new field that has not yet reached its full potential.

In conclusion, the benefits of precision medicine are still largely in the future, but it is time to start introducing the concepts to your practice. The right combination of ongoing professional development, technology to track and secure medical records, and patient education can prepare you to move into this future without being left behind it.

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