Let’s imagine for a minute the practice of psychiatry in the year 2070. According to Ray Kurzweil at the Lake Nona Innovation Conference in 2017,¹ because we will all have embedded nanobots that monitor our physiology, our longitudinal biomarkers will inform us and our artificial intelligence (AI) helpers about which biomarkers deviate from what is usual and normal.

By the way, Kurzweil also predicted at the conference that those same nanobots will also have the capacity to diagnose and treat at least some diseases. If necessary, as calculated by Bayesian Information Criterion² statistics derived from big data, the AI helper will order further tests to clarify the diagnosis. Based on the biomarkers, the AI helper will provide a set of options that will have the highest probability of the best outcomes. Because data from our patients’ medical record will include genetic and epigenetic data along with family and developmental history and history of responses to medication plus side effect preferences, the AI helper will focus on just a few options so you have the illusion of free will and can make a choice among acceptable options for your patients. After you check what the AI helper recommends, you communicate with your patient remotely, discuss the options, and then prescribe treatment delivered by a mini-drone within minutes.

Once treatment begins, the nanobots sense when the patient starts taking the medication and tracks changes in relevant biomarker mediators along with patient-reported outcomes to predict the results. If all goes well, then the data generated by the treatment episode is automatically added to the “great database in the sky” to refine the predictive model. These data will also provide a dashboard to inform us about the outcomes of patients we treat, as well as the results of similar patients in our health care systems.

We have a long way to go from this fanciful scenario, but not as far as you may think. Big data are here. Big algorithms are here. AI is here. Not here yet are useful biomarkers to guide treatment. Studies such as EMBARC (Establishing Moderators and Biosignatures of Antidepressant Response in Clinical Care)³ for major depressive disorder are the first steps in developing biomarkers to help us determine which treatment for which patient and when. Despite countless studies, so far, no biomarker has made the leap from academic curiosity to useful clinical practice. But just wait.

REFERENCES

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