BMJ

BMJ 2012;344:e681 doi: 10.1136/bmj.e681 (Published 8 February 2012)

OBSERVATIONS

MEDICINE AND THE MEDIA

Would you like your telomeres tested?

A US company claims that the length of people's telomeres indicates their general state of health. **Margaret McCartney** questions the reliability of the test

Margaret McCartney *general practitioner, Glasgow*

A company that is based in the United States, Life Length, is offering "telomere testing and services" from its laboratory in Spain, with the aim of "making it easy for physicians and their patients to take our biomarker test," says its press release.[1] It adds, "Telomeres are best predictors of biological age and excellent general health indicators, highly related to the emergence of age-related diseases. This test will likely become standard in checks-up and preventive healthcare. US doctors can now incorporate Life Length's telomere test easily into their practice."

Telomeres are repeated sequences of DNA at the end of chromosomes that stabilise the chromosomes and prevent them being identified by cells as broken DNA. For some time it has been known that abnormal or shortened telomeres cause chromosomal problems, which in turn have been related to some disorders, including tumorigenesis. Life Length says that it can test anyone, no matter where they are, although the blood sample to be tested must be analysed within 48 hours and kept at 4°C in transit to the laboratory in Spain. The company says that it has already tested samples from UK and other European citizens, at a cost to each of about $700 (£450; €540). In the US the test is offered with a "physician consultative fee" that takes the total to about $1000.

What kind of independent information about the test is available to patients before testing? María Blasco, the company's chief scientific adviser, and Stephen Matlin, its chief executive said in an email, "We do not provide medical advice to patients . . . This is something for the individuals' physicians to handle, but generally none. We have found that most people that want to do this test are already well informed about telomeres and their importance, often more than their doctors."

So how useful is the test? Dr Blasco and Mr Matlin say, "As a biomarker of general health the test offers information of interest. If there is a negative finding (that is, biological age significantly above chronological age) it is a tap on the shoulder that we are probably not doing something right (perhaps excessive stress, poor sleep habits, too much smoking or drinking, obesity, insufficient exercise, etc) and that a change in lifestyle habits would be opportune. There are of course specific situations; say a woman who cannot have children that is chronologically in her late 20s. If the test shows that she is in fact a 50 year old from the point of view of her telomeres, that will likely help her physician in selecting possible treatment (personalised medicine)."

But this raises more questions than it answers. How reliable are telomeres? Is advice about lifestyle and avoiding risk factors not the same advice we would give to people regardless of the length of their telomeres? And how evidence based or practical is use of this information for "personalised" medicine?

In fact, there is no good quality research evidence on the harms and benefits of testing telomere length in asymptomatic individuals. Peter Lansdorp is the scientific director of the European Institute on the Biology of Ageing at the University of Groningen, in the Netherlands, and professor of medicine at the University of British Columbia, Vancouver. He also founded the company Repeat Diagnostics, in 2005, which is based in Canada and which offers telomere length testing. He says that the test has limited usefulness for people who are well.

"We know there is large variation in telomere length in normal individuals: a teenager might have shorter telomeres compared with a 70 year old. What are we going to tell such a teenager? That he or she should be concerned or do things differently based on the telomere test results? There are a number of diseases where short telomeres are directly implicated—but, as far as we know at this point, it's a minor fraction of the population who are affected by genetic telomere pathways. We can't assume that all will benefit from this information—going to the gym or a change in diet seems a better way to spend the money."

Instead, he thinks that telomere testing is likely to be useful only in specific situations of illness that runs in families. "Our samples are typically sent by specialists from patients with bone marrow failure or pulmonary fibrosis, when they are making decisions about treatment including transplantation and so on." His company primarily offers the service to doctors rather than directly to members of the public.

Life Length, however, under the heading, "Want to know your biological age?" suggests to people who want to know what

margaret@margaretmccartney.com

they can do if they get a "bad" result: "Knowing that you have a higher than average percentage of short telomeres is like knowing that you have high cholesterol or other conditions which are influenced by life-style choices; it affords you, following professional advice, the opportunity to make those changes that may allow you to reduce your rate of telomere aging proactively. Currently there is no prescription medication available that allows individuals to medically control telomere loss but it is likely that in the future there will be."

It also recommends "repeating the measurement every 3 or 6 months instead of the usual annual measurement." These recommendations are not based on evidence and serve to distract us from the true causes of ill health and proved interventions in preventive healthcare. Media coverage of telomere testing is likely to be encouraged with such press released commercial hype, which serves patients and doctors poorly.

1 PR Newswire. Life Length telomere test available nationwide. 8 Dec 2011. www.prnewswire.com/news-releases/life-length-telomere-test-available-nationwide-135241698.html.

Cite this as: *BMJ* 2012;344:e681