Shiels, P.G. (2012) *CDKN2A might be better than telomere length in determining individual health status.* British Medical Journal, 344 . e1415. ISSN 0959-8138

Copyright © 2012 BMJ Publishing Group Ltd.

A copy can be downloaded for personal non-commercial research or study, without prior permission or charge.

The content must not be changed in any way or reproduced in any format or medium without the formal permission of the copyright holder(s)

When referring to this work, full bibliographic details must be given.

http://eprints.gla.ac.uk/62128/

Deposited on: 13th December 2012

Enlighten – Research publications by members of the University of Glasgow
http://eprints.gla.ac.uk

BMJ

BMJ 2012;344:e1415 doi: 10.1136/bmj.e1415 (Published 6 March 2012)

LETTERS

TELOMERE TESTING

CDKN2A might be better than telomere length in determining individual health status

Paul G Shiels *molecular biologist*

Institute of Cancer Sciences, University of Glasgow, Western Infirmary, Glasgow G11 6NT, UK

McCartney notes that telomere length measurement raises more questions than it answers.[1]

Determination of personal health status based on a biomarker of ageing and not as a direct function of chronology requires very sensitive and specific biomarkers. Validated markers of biological age are few and must meet the Baker and Sprott criterion—"A biomarker of ageing is a biological parameter of an organism that either alone or in some multivariate composite will, in the absence of disease, better predict functional capability at some late age, than will chronological age."[2]

Although many biomarkers have been tested, only two fulfil this criterion—*CDKN2A* and telomere length. *CDKN2A* has been tested only in small independent studies and rarely in combination with telomere length. In these, telomere length has proved to be a significantly weaker biomarker. *CDKN2A* has also proved to be superior to chronological age.[3 4]

Inter-individual variation in telomere length is subject to numerous socioeconomic and lifestyle confounders. This makes it very unreliable in individuals.[5 6] From this standpoint, using telomere length commercially to determine individual health status seems premature.

A knowledge of telomere length as a read-out of health is, however, still very relevant, but only in the context of larger clinical investigations and population or public health studies, where socioeconomic, lifestyle, and epigenetic confounders are taken into account.[6] It remains to be determined how relevant *CDKN2A* expression will prove to be as a measure of personal and public health.

Competing interests: None declared.

1 McCartney M. Would you like your telomeres tested? *BMJ* 2012;344:e681. (8 February.)
2 Baker GT 3rd, Sprott RL. Biomarkers of aging. *Exp Gerontol* 1988;23:223-39.
3 Koppelstaetter C, Schratzberger G, Perco P, Hofer J, Mark W, Ollinger R, et al. Markers of cellular senescence in zero hour biopsies predict outcome in renal transplantation. *Aging Cell* 2008;7:491-7.
4 McGlynn LM, Stevenson K, Lamb K, Zino S, Brown M, Prina A, et al. Cellular senescence in pretransplant renal biopsies predicts postoperative organ function. *Aging Cell* 2009;8:45-51.
5 Shiels PG. Improving precision in investigating aging: why telomeres can cause problems. *J Gerontol A Biol Sci Med Sci* 2010;65:789-91.
6 Shiels PG, McGlynn LM, MacIntyre A, Johnson PC, Batty GD, Burns H, et al. Accelerated telomere attrition is associated with relative household income, diet and inflammation in the pSoBid cohort. *PLoS One* 2011;6:e22521.

Cite this as: *BMJ* 2012;344:e1415

© BMJ Publishing Group Ltd 2012

paul.shiels@clinmed.gla.ac.uk

For personal use only: See rights and reprints http://www.bmj.com/permissions Subscribe: http://www.bmj.com/subscribe