

Bond University
Research Repository



Is the NHS 'Heart Age Test' too much medicine?

Bonner, Carissa; McKinn, Shannon; McCaffrey, Kirsten; Glasziou, Paul; Irwig, Les; Doust, Jenny; Jansen, Jesse; Bell, Katy

Published in:
Journal of the Royal College of General Practitioners

DOI:
[10.3399/bjgp19X706349](https://doi.org/10.3399/bjgp19X706349)

Licence:
Other

[Link to output in Bond University research repository.](#)

Recommended citation(APA):
Bonner, C., McKinn, S., McCaffrey, K., Glasziou, P., Irwig, L., Doust, J., Jansen, J., & Bell, K. (2019). Is the NHS 'Heart Age Test' too much medicine? *Journal of the Royal College of General Practitioners*, 69(688), 560-561. <https://doi.org/10.3399/bjgp19X706349>

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

For more information, or if you believe that this document breaches copyright, please contact the Bond University research repository coordinator.

Is the NHS 'Heart Age Test' Too Much Medicine?

Journal:	<i>British Journal of General Practice</i>
Manuscript ID	BJGP-2019-0054.R1
Manuscript Type:	Life & Times
Date Submitted by the Author:	14-Mar-2019
Complete List of Authors:	Bonner, Carissa; University of Sydney, Faculty of Medicine and Health, School of Public Health McKinn, Shannon; University of Sydney, Faculty of Medicine and Health, School of Public Health; McCaffery, Kirsten; University of Sydney, Faculty of Medicine and Health, School of Public Health Glasziou, Paul; Bond University, Faculty of Health Sciences and Medicine Irwig, Les; University of Sydney, Faculty of Medicine and Health, School of Public Health Doust, Jenny; Bond University, Faculty of Health Sciences and Medicine Jansen, Jesse; University of Sydney, Faculty of Medicine and Health, School of Public Health Bell, Katy; University of Sydney, Faculty of Medicine and Health, School of Public Health
Keywords:	Screening < Health promotion and prevention, Cardiovascular disease < Clinical (physical)

SCHOLARONE™
Manuscripts

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1 Word did not find any entries for your table of contents. **TITLE:** Is the NHS ‘Heart Age Test’
2 Too Much Medicine?

3 **AUTHORS:** Carissa Bonner¹, Shannon McKinn¹, Kirsten McCaffrey¹, Paul Glasziou², Les
4 Irwig¹, Jenny Doust¹, Jesse Jansen^{1*}, Katy Bell^{1*}

5 *Equal last authors

- 6 1. The University of Sydney, School of Public Health. Sydney, AUSTRALIA.
- 7 2. Bond University, Faculty of Health Sciences and Medicine. Robina, AUSTRALIA.

8
9 **CORRESPONDING AUTHOR:**

10 Katy Bell. School of Public Health, Edward Ford Building (A27), The University of Sydney,
11 NSW 2006, AUSTRALIA. Email: katy.bell@sydney.edu.au.

12
13 **WORD COUNT:** 1671

www.Only

16 INTRODUCTION

17 The NHS 'Heart Age Test' has expanded CVD risk assessment in the UK to include younger
18 people. Public Health England's 'Healthy Heart' campaign, launched in September 2018,
19 encourages all adults aged 30+ years to do the test (see Figure 1), stating: "*Having a heart age
20 older than your chronological age means that you are at a higher risk of having a heart attack or
21 stroke.*" But does older heart age really mean high risk? The calculator will give you an older age
22 if at least one CVD risk factor is higher than the level set as 'optimal'; but this does not
23 necessarily mean you are at high risk of a CVD event in the next 10 years, as shown by the
24 examples in Figure 1. Is there evidence to support PHE's promotion of the heart age test? To find
25 out, we evaluated the 'Heart Age Test' according to Public Health England's own National
26 Screening Committee criteria. This analysis suggests heart age is not a good screening test.

28 **Figure 1. NHS 'Heart Age Test' [INSERT FIGURE 1 HERE]**

29 **Caption:** Heart Age Test results for a 35 year-old woman at low risk of CVD (Case 1, Table 1).

31 **1. The condition should be an important health problem as judged by its frequency and/or
32 severity.** CVD is an important health problem. The rate of death from CVD has declined
33 throughout the UK in the last 3 decades,(1) but CVD remains the leading cause of death in men
34 and second leading cause of death in women, with around 160,000 people in the UK dying from
35 CVD every year.

1
2
3 37 **2. There should be a simple, safe, precise and validated screening test.** Though the ‘Heart
4
5 38 Age Test’ calculator is simple and physically safe to use, it is not precise or validated. Heart age
6
7 39 is estimated from the lifetime risk of CVD, relative to people of the same age, gender and
8
9 40 ethnicity who have ‘optimal’ risk factor levels (e.g. non-smoker, systolic blood pressure <120
10
11 41 mm Hg).(2) The authors of the last update of the NICE guidelines on CVD risk assessment in
12
13 42 2014 found insufficient evidence to recommend lifetime risk as a validated screening test. There
14
15 43 is even less evidence for indirect measures of lifetime risk, such as heart age.
16
17
18
19
20 44

21
22
23 45 **3. The distribution of test values in the target population should be known and a suitable**
24
25 46 **cut-off level defined and agreed.** The ‘Heart Age Test’ targets everyone aged 30+ years, and is
26
27 47 disproportionately used by younger people <40 years.(2) In contrast, formal CVD risk
28
29 48 assessment as part of NHS Health Checks targets people ≥ 40 years. According to Public Health
30
31 49 England, of two million ‘Heart Age Test’ users the majority (78%) had older heart age. All are
32
33 50 prompted to visit a GP and described as having ‘increased risk of heart disease’, but there has
34
35 51 been no assessment on the suitability of [heart age – chronological age] >0 as a cut-off level to
36
37 52 prompt further testing.
38
39
40
41

42 53
43
44
45 54 **4. The test, from sample collection to delivery of results, should be acceptable to the target**
46
47 55 **population.** The acceptability of heart age depends on whether it matches users’ expectations. A
48
49 56 ‘think aloud’ study found that older heart age was confronting and discredited by users if it did
50
51 57 not match prior risk perception; while younger heart age was viewed as positive but
52
53 58 unrealistic.(3) A randomised trial confirmed that heart age was perceived as less credible and
54
55
56
57
58
59
60

1
2
3 59 elicits more negative emotions compared to absolute CVD risk.(4) Further acceptability issues
4
5 60 are highlighted by public responses (Supplement 1).
6
7
8 61

9
10
11 62 **5. There should be an agreed policy on the further diagnostic investigation of individuals**
12
13 63 **with a positive test result and on the choices available to those individuals.** There is no
14
15 64 agreed policy on further investigation of individuals with older heart age results (i.e. 78% of
16
17 65 users). It prompts people to have an NHS Health Check, which is recommended for those over
18
19 66 40 and which itself is controversial. A Cochrane review found no evidence that these checks are
20
21 67 beneficial, and they may even cause harm through the diagnosis and treatment of conditions
22
23 68 unlikely to cause symptoms or death (i.e. overdiagnosis and overtreatment).(5) Encouraging
24
25 69 large numbers of asymptomatic young people to have their blood pressure and cholesterol
26
27 70 measured is not an agreed policy with the RCGP or the UK National Screening Committee.
28
29
30
31
32 71

33
34
35 72 **6. There should be agreed evidence-based policies covering which individuals should be**
36
37 73 **offered interventions and the appropriate intervention to be offered.** Convincing patients
38
39 74 with CVD risk factors to change their lifestyle is important at any age, and heart age could be
40
41 75 used for this.(6) An RCT found that online assessment of heart age can improve risk factor
42
43 76 management compared to verbal counselling about absolute risk.(7) However, direct
44
45 77 experimental comparisons between heart age and absolute risk have found no effect on lifestyle
46
47 78 intentions or behaviour.(4) Where heart age has motivated lifestyle change, this has been within
48
49 79 a clinical context. This is quite different to a pre-consultation screening test, where existing
50
51 80 lifestyle and circumstances are not taken into account, resulting in implausible heart age
52
53 81 estimates that discredit the results (e.g. older heart age in very fit people, or younger heart age in
54
55
56
57
58
59
60

1
2
3 82 obese people).(3) Medication guidelines recommend assessing the absolute risk of a CVD event
4
5 83 and prioritising treatment to those at highest risk who are most likely to benefit.(8) Absolute risk
6
7
8 84 is preferred for treatment decisions, rather than single risk factors such as blood pressure (9) or
9
10 85 cholesterol. Heart age is an ill-defined measure of risk, relative to others of the same age, gender
11
12 86 and ethnicity with optimal risk factor levels.(3,10) As it is not a measure of absolute risk, it is not
13
14
15 87 helpful for medication decisions.(4,10)
16
17
18 88

19
20
21 89 **7. There should be evidence from high quality randomised controlled trials that screening**
22
23 90 **is effective in reducing mortality or morbidity.** There is evidence for several interventions that
24
25 91 might be prompted through heart age screening, including smoking advice and lowering blood
26
27 92 pressure/cholesterol. However, the Cochrane review of health checks shows that promoting these
28
29 93 in a non-targeted way has no impact on actual CVD,(5) possibly because it attracts people at
30
31 94 lower, rather than higher, risk. Since predominantly younger people use the ‘Heart Age Test’,(2)
32
33 95 it may exacerbate the problem of low risk people attending health checks. There is no trial
34
35 96 evidence that using heart age to screen for CVD risk or prompt formal CVD assessment reduces
36
37 97 mortality or morbidity.
38
39
40
41
42 98

43
44
45 99 **8. The benefit gained by individuals from the screening programme should outweigh any**
46
47 100 **harms.** The ‘Heart Age Test’ has no direct evidence of benefit, and there is potential for harm.
48
49 101 Heart age results may lead high risk people to disregard relevant risk information if they don’t
50
51 102 believe the results, and cause low risk people to worry and seek unnecessary tests.(3,4) Other
52
53 103 potential harms include negative psychological and behavioural effects of disease labelling,
54
55
56
57
58
59
60

1
2
3 104 physical harms and side effects of unnecessary tests or treatment for CVD, hassles and cost of
4
5 105 unnecessary tests and treatments, wasted resources and opportunity costs to the health system.
6
7
8 106 These harms, which contribute to overmedicalisation of society in general,(11) should not be
9
10 107 underestimated.

11
12
13 108
14
15
16 109 **9. The opportunity cost of the screening programme (including testing, diagnosis and**
17
18 110 **treatment, administration, training and quality assurance) should be economically**
19
20 111 **balanced in relation to expenditure on medical care as a whole.** The ‘Heart Age Test’ tells
21
22 112 anyone over 30 to make an appointment with their GP, nurse or pharmacist to have their
23
24 113 cholesterol level or blood pressure measured if this is unknown. This may add to GPs’ already
25
26 114 overburdened workload, increase waiting times and detract attention from necessary high value
27
28 115 care/ treatments for patients who are unwell.
29
30
31
32
33 116

34
35
36 117 **10. Evidence-based information, explaining the purpose and potential consequences of**
37
38 118 **screening, investigation and preventative intervention or treatment, should be made**
39
40 119 **available to potential participants to assist them in making an informed choice.** There is
41
42 120 very little published information explaining what exactly heart age represents to enable an
43
44 121 informed choice on whether or not to use it. As a GP wrote recently in The BMJ Opinion:

45
46
47
48 122 *“I’ve looked at the supporting documents and can’t find any answers. Perhaps they’re*
49
50 123 *there if you dig deep enough through the JBS3 website (which the tool points you*
51
52 124 *towards), but that’s not the point. If I can’t find the answer after 20 minutes of looking,*
53
54
55 125 *who else is going to bother? The public deserve to know how accurate these estimates*

1
2
3 126 *are. Presenting uncertainty as fact is not what the public, or our patients, want or need.”*
4
5 127 *(BMJ Blogs, 2018 Sept 12)*
6
7

8 128 The ‘Heart Age Test’ provides no information about who should use it, recommends cholesterol
9
10 129 and blood pressure testing for everyone who does not enter values for these, and provides no
11
12 130 information about the potential benefits, harms and costs of having these additional tests done
13
14 131 and of taking any medication which might subsequently be offered.(10) It is therefore not
15
16 132 possible to make an informed choice about using it.(12) Furthermore, the ‘Heart Age Test’ may
17
18 133 confuse people when heart age and absolute risk are contradicting (e.g. low risk but heart age
19
20 134 higher than own age), and convey conflicting messages about the person’s risk and the need for
21
22 135 medication.(3)
23
24
25
26
27
28
29

30 137 **CONCLUSION**

31
32
33 138 The ‘Heart Age Test’ is effectively a screening test that expands CVD risk assessment to include
34
35 139 younger people without proper consultation or informed consent. It encourages almost 80% of –
36
37 140 mostly young – users to see their GP for further medical interventions. Apart from being a test
38
39 141 for an important condition (CVD), the ‘Heart Age Test’ meets none of the National Health
40
41 142 England’s own assessment criteria for a potentially useful screening test. As stated in a recent
42
43 143 article about the de-adoption of ineffective clinical practices:
44
45
46
47

48 144 *“We need to take a more cautious approach to technology adoption, and learn from*
49
50 145 *mistakes of early adoption of health care technologies based on little or low-quality*
51
52 146 *clinical evidence. This way we can prevent the need to ‘break up’ with the practice when*
53
54 147 *the high-quality evidence shows that it is ineffective.”* (New York Times, 2018 Sept 11)
55
56
57

1
2
3 148 The NHS might do well to take this advice before adopting and promoting online technologies
4
5 149 such as heart age calculators. The results of heart age calculators should be limited to lifestyle
6
7 150 advice, ideally within the setting of the clinical consultation, to avoid inadvertent population
8
9 151 screening for CVD using an unvalidated screening test.
10
11
12

13 152
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

For Review Only

1
2
3 **153 AUTHOR CONTRIBUTIONS**

4 **154**
5 **155** KB and JJ are the guarantors of the article and drafted the manuscript with CB, based on her PhD
6
7
8 **156** investigating CVD risk communication, including heart age. All authors contributed to
9
10 **157** discussion and revision of the paper. CB, SM, KM and JJ are psychology academics with
11
12 **158** expertise in shared decision making and risk communication. KB and LI are clinical
13
14 **159** epidemiologists with expertise in test evaluation and CVD risk models. PG and JD are academic
15
16
17 **160** GPs with expertise in evidence-based practice and clinical CVD guidelines.
18

19 **161**
20 **162 CONFLICTS OF INTEREST**

21
22
23 **163** We declare that we have no conflicts of interest to report.
24

25 **164**

26
27 **165**
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

ew Only

166 **REFERENCES**

- 1
2
3
4
5
6 167 1. Bhatnagar P, Wickramasinghe K, Wilkins E, et al. Trends in the epidemiology of
7
8 168 cardiovascular disease in the UK. *Heart* 2016;102(24):1945–52. doi: 10.1136/heartjnl-
9
10 169 2016-309573
- 11
12
13 170 2. Patel RS, Lagord C, Waterall J, et al. Online self-assessment of cardiovascular risk
14
15 using the Joint British Societies (JBS3)-derived heart age tool: a descriptive study.
16 171
17 *BMJ Open* 2016;6:e011511. doi: 10.1136/bmjopen-2016-011511
18 172
- 19
20
21 173 3. Bonner C, Jansen J, Newell BR, et al. I don't believe it, but I'd better do something
22
23 about it: patient experiences of online heart age risk calculators. *J Med Internet Res*
24 174
25 2014;16:e120. doi: 10.2196/jmir.3190
26 175
- 27
28
29 176 4. Bonner C, Jansen J, Newell BR, et al. Is the “Heart Age” concept helpful or harmful
30
31 compared to absolute cardiovascular disease risk? An experimental study. *Med Decis*
32 177
33 *Making* 2015;35:967-78. doi: 10.1177/0272989X15597224
34 178
- 35
36 179 5. Krogsbøll L, Jørgensen K, Gøtzsche P. General health checks in adults for reducing
37
38 morbidity and mortality from disease. *Cochrane Database Syst Rev* 2019; Issue 1.Art.
39 180
40 No.:CD009009. doi: 10.1002/14651858.CD009009.pub3 [Update to 2019]
41 181
42
43 182 6. Wells S, Kerr A, Eadie S, et al. “Your Heart Forecast”: a new approach for describing
44
45 and communicating cardiovascular risk? *Heart* 2010;96:708–13. doi:
46 183
47 10.1136/hrt.2009.191320
48 184
49
50 185 7. Lopez-Gonzalez AA, Aguilo A, Frontera M, et al. Effectiveness of the Heart Age tool
51
52 for improving modifiable cardiovascular risk factors in a Southern European
53 186
54
55
56
57
58
59
60

- 1
2
3 187 population: a randomized trial. *Eur J Prev Cardiol* 2015;22:389–96. doi:
4
5 188 10.1177/2047487313518479
6
7
8 189 8. Jackson R, Lawes CMM, Bennett DA, et al. Treatment with drugs to lower blood
9
10 pressure and blood cholesterol based on an individual’s absolute cardiovascular risk.
11 190
12 *Lancet* 2005;365:434–41. doi: 10.1016/S0140-6736(05)17833-7
13 191
14
15
16 192 9. Bell KJL, Doust J, Glasziou P. Incremental benefits and harms of the 2017 American
17
18 College of Cardiology/American Heart Association High Blood Pressure Guideline.
19 193
20 *JAMA Intern Med* 2018;178(6):755–757. doi:10.1001/jamainternmed.2018.0310
21 194
22
23
24 195 10. Bonner C, Bell K, Jansen J, et al. Should heart age calculators be used alongside
25
26 absolute cardiovascular disease risk assessment? *BMC Cardiovasc Disord*. 2018
27 196
28 Feb;18:19. doi: 10.1186/s12872-018-0760-1
29 197
30
31 198 11. McCaffery KJ, Jansen J, Scherer LD, et al. Walking the tightrope: communicating
32
33 overdiagnosis in modern healthcare. *BMJ* 2016;352:i348. Doi: 10.1136/bmj.i348
34 199
35
36 200 12. Montori VM, Brito JP, Ting HH. Patient-centered and practical application of new
37
38 high cholesterol guidelines to prevent cardiovascular disease. *JAMA* 2014;311:465–6.
39 201
40
41 202 doi: 10.1001/jama.2014.110
42
43
44 203
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

HOW HEALTHY IS YOUR HEART?

The Heart Age Test:

- Tells you your heart age compared to your real age
- Explains why it's important to know your blood pressure and cholesterol numbers
- Gives advice on how to reduce your heart age

START

Full [terms and conditions](#) can be read here

YOUR HEART AGE IS ABOUT 37

Compared to a person of the same age, gender and ethnicity without raised risk factors.

On average, someone like you can expect to live to the age of **82** without having a heart attack or stroke.

[About your calculation](#)

See how your heart age changes if you:

Lose weight i

YOUR HEART AGE IS ABOUT 37

Compared to a person of the

✕

Your risk of having a heart attack or stroke within the next 10 years is **0.4%**

Your heart age is higher than your actual age. You can lower it by making some simple changes to your diet and lifestyle.

Heart Age Test results for a 35 year-old woman at low risk of CVD (Case 1, Table 1)