‘Better’ clinical decisions do not necessarily require more time to make

Citation for published version:

Digital Object Identifier (DOI):
http://dx.doi.org/10.1016/j.jclinepi.2016.11.004

Link:
Link to publication record in Edinburgh Research Explorer

Document Version:
Peer reviewed version

Published In:
Journal of Clinical Epidemiology

General rights
Copyright for the publications made accessible via the Edinburgh Research Explorer is retained by the author(s) and / or other copyright owners and it is a condition of accessing these publications that users recognise and abide by the legal requirements associated with these rights.

Take down policy
The University of Edinburgh has made every reasonable effort to ensure that Edinburgh Research Explorer content complies with UK legislation. If you believe that the public display of this file breaches copyright please contact openaccess@ed.ac.uk providing details, and we will remove access to the work immediately and investigate your claim.
'Better' clinical decisions do not necessarily require more time to make

Authors
Nicola McCleary\textsuperscript{1,2,3}, Jill J Francis\textsuperscript{4}, Marion K Campbell\textsuperscript{2}, Craig R Ramsay\textsuperscript{2}, Martin P Eccles\textsuperscript{5}, Shaun Treweek\textsuperscript{2}, Julia Allan\textsuperscript{1}

Addresses
\textsuperscript{1}Aberdeen Health Psychology Group, University of Aberdeen, Health Sciences Building, Foresterhill, Aberdeen AB25 2ZD, UK (where the work was done)

\textsuperscript{2}Health Services Research Unit, University of Aberdeen, Health Sciences Building, Foresterhill, Aberdeen AB25 2ZD, UK (where the work was done)

\textsuperscript{3}Usher Institute of Population Health Sciences and Informatics, University of Edinburgh, Old Medical School, Teviot Place, Edinburgh EH8 9AG, UK (present address)

\textsuperscript{4}School of Health Sciences, City University London, Northampton Square, London EC1V 0HB, UK

\textsuperscript{5}Retired but at Institute of Health and Society, Newcastle University, Baddiley Clark Building, Richardson Road, Newcastle upon Tyne NE2 4AX, UK when the work was done

Corresponding author
Nicola McCleary
Usher Institute of Population Health Sciences and Informatics
University of Edinburgh
Doorway 3, Old Medical School
Teviot Place
Edinburgh EH8 9AG
UK

Email: nicola.mccleary@ed.ac.uk
Phone: +44 131 650 2682

Keywords
general practitioner; upper respiratory tract infection; clinical decision-making; antibiotic prescribing; patient scenario
Research Letter

The web-based intervention modelling experiment (IME; randomised study in a simulated setting) reported by Treweek and colleagues [1] provided support for using IME methodology in the evaluation of interventions to improve quality of care. As well as the management decision made, Treweek and colleagues’ data on general practitioners’ (GPs) responses to scenarios describing uncomplicated Upper Respiratory Tract infection (URTI) included a measure of perceived decision difficulty for each decision, and the time taken to make each decision. To further inform the development of interventions to improve quality of care, we analysed these data, aiming to quantify the relationships between decision difficulty, decision appropriateness, and the speed at which decisions were made.

Perceived difficulty was measured using a 1 (not at all difficult) to 10 (extremely difficult) scale. As scenarios presented no clear cases for prescribing an antibiotic, decisions were categorised as appropriate (clear decisions to not prescribe) or inappropriate (clear decisions to prescribe; or delayed prescribing; and uncodable decisions). Decision time (the time spent reading the scenario, making a decision, and typing a response) was recorded by the web-based platform. Time data were analysed only where GPs had completed the scenarios in one session. Times longer than 600 seconds (10 minutes) were excluded as outliers. Missing data was excluded. Correlation and logistic regression were used to explore associations.

Eight baseline scenarios completed by 270 GPs, involving 2150 decisions, 2062 difficulty ratings, and 1024 time scores, were analysed. Overall, 65% (1408) of the decisions were appropriate (no prescribing). The mean (SD) difficulty rating was 3.4 (2.1). Time scores were positively skewed: median (IQR) decision time was 69 (75) seconds. Perceived difficulty and decision time were positively correlated (Spearman’s rho(984) =.357, p<.001) with more difficult decisions taking longer to make. Quicker decisions were more likely to be appropriate (Spearman’s rho(1022) =-.408, p<.001), and each unit decrease in perceived difficulty was associated with 12% greater odds of an appropriate decision (OR 0.89 CI 0.84 to 0.94; controlling for scenario).

In summary, it was more likely that an appropriate (no prescribing) decision would be made for uncomplicated URTI when perceived decision difficulty was lower and decision time was shorter. This suggests that appropriate decisions can be made quickly using a less effortful cognitive process, and that simply giving GPs more time to make decisions would not necessarily improve the appropriateness of their decisions. Indeed the provision of more time is unlikely to be feasible, given the time constraints inherent in the GP role. Intervention strategies aimed at reducing cognitive effort may therefore be useful. Strategies could be
based on fast-and-frugal heuristics paradigms, which involve rapid processing of relatively little information to make a decision [2]. Indeed, researchers have developed such strategies to assist clinicians in decision-making which compare favourably with more complex decision support tools [3]. Strategies which enable GPs to make the best use of their limited time may therefore be an important contribution to interventions to improve quality of care.

Acknowledgements

We would like to thank the GPs who took part in the original study, and Marie Pitkethly and Gail Morrison at the Scottish Primary Care Research Network (SPCRN) for their help and support in recruiting GPs. Thanks also to Chris Burton and Fiona Garton at the University of Aberdeen for assistance with scenario coding.

Funding

The original study was funded by the Chief Scientist Office, grant number CZH/4/610. The analyses reported here were funded by a Medical Research Council Doctoral Training Grant awarded to the first author. The Health Services Research Unit, University of Aberdeen, is core funded by the Chief Scientist Office of the Scottish Government Health Directorates. The funding sources had no role in the study design; the collection, analysis, or interpretation of data; the writing of the report; or in the decision to submit the article for publication.

Ethical approval and trial registration

The original study was approved by the Tayside Committee on Medical Research Ethics A, Research Ethics Committee reference 10/S1401/54 and received NHS Research & Development approval from the 12 National Health Service (NHS) Health Boards involved. Permission to access and analyse the data was obtained from the Tayside Research Ethics Committee at the request of the Principal Investigator of the original study (ST). The trial of which the original study is part is registered: ClinicalTrials.gov number NCT01206738.

Authors’ contributions

All authors contributed to the design of the study. NM did most of the day-to-day running of the study, with support from JJJ, MKC, CRR, and JA. ST provided the data, and MPE
provided accompanying documentation. NM analysed and interpreted the data, with ongoing advice from all other authors. This manuscript was drafted by NM and critically revised by all other authors. All authors read and approved the final manuscript.

Conflicts of interest statement

Conflicts of interest: none

References

