



## Questionnaire about clinical decision support systems

**Thank you for completing this form on behalf of your Specialty and its members.**

**A clinical decision support system (CDSS) is a computer system that generates patient-specific advice or risk estimates to support clinical decisions. Examples include:**

- A prescribing advisor that either suggests a drug, or calculates the correct dosage of a drug (eg. warfarin) according to patient features, BNF recommendations etc.
- An ECG, lab test or lung function test interpreter that give an interpretation of the meaning of test results – as opposed to simply indicating that a lab test is out of range.
- An algorithm derived from a large dataset that predicts important clinical outcomes, like NHPredict for breast cancer mortality, QRisk2 for cardiac mortality or the CHADS2 risk score for risk of stroke in patients with AF.

**There is considerable concern and activity around the NHS and Government about the safety and impact of medical algorithms, AI, machine learning black boxes and clinical decision support systems (CDSS). For example, this month the College announced its policy on AI and NHS England announced its initial Code of Conduct on the procurement and use of these tools, which is now out for consultation. Several recent reports have both advocated greater use of AI in healthcare and discussed the potential risks, and last year Sir Mark Walport organised a cross-government workshop on this topic.**

**To ensure that the RCP Health Informatics Unit, Patient Safety Committee and physicians in general are properly briefed about these issues, we are giving you an opportunity to share your experience (both benefits and harms) with AI, machine learning etc.**

**Completing this survey may require discussion with senior colleagues responsible for patient safety, quality improvement and / or informatics, and took pilot 6 participants less than 10 minutes to fill out. Findings of the survey will be published in RCP Commentary to coincide with the RCP Medicine 2019 conference in April which will include an AI theme. The results will also be used in RCP response to the consultation on Matt Hancock's vision.**

**Please arrange for this questionnaire to be completed on behalf of your Specialty by Monday 10th December. Any enquiries can be directed to [informatics@rcplondon.ac.uk](mailto:informatics@rcplondon.ac.uk)**

About you

Your name:

On behalf of which  
Specialty?

### **1. Questions about the use of CDSS by members of your specialty**

For which clinical tasks do you believe that members of your specialty typically use a CDSS [tick all that apply]?

☐ assisting diagnosis

☐ assisting in choice of therapy

☐ reporting or interpreting investigation results

☐ calculating dosage of a drug

☐ monitoring disease activity in a long term condition

☐ calculating risk or prognosis

☐ other clinical task



## Questionnaire about clinical decision support systems

### 2. Questions about the benefits of CDSS

What does your speciality see as the **three** main benefits of CDSS [tick up to 3]:

- |  |   |
|--|---|
| <input type="checkbox"/> a) Improved patient safety          | <input type="checkbox"/> f) Better use of investigations      |
| <input type="checkbox"/> b) More efficient clinical work     | <input type="checkbox"/> g) More accurate diagnoses           |
| <input type="checkbox"/> c) Reduced resource utilisation     | <input type="checkbox"/> h) Fewer drug side effects           |
| <input type="checkbox"/> d) Better patient outcomes          | <input type="checkbox"/> i) More attention to preventive care |
| <input type="checkbox"/> e) Improved medicines management    |   |
| <input type="checkbox"/> j) Other benefits (please specify): |   |

What **three** actions does your speciality think are most important to help realise these benefits [tick up to 3]?

- |   |  |
|---|--|
| <input type="checkbox"/> a) Involving clinicians in CDSS design at an early stage                     | <input type="checkbox"/> f) Testing the impact of CDSS   |
| <input type="checkbox"/> b) Involving physicians in writing the business case for a CDSS              | <input type="checkbox"/> g) Calculating the cost effectiveness of CDSS                           |
| <input type="checkbox"/> c) Involving physicians in the procurement process for CDSS                  | <input type="checkbox"/> h) Involving physicians in the update process for CDSS                  |
| <input type="checkbox"/> d) Training the users of CDSS  | <input type="checkbox"/> i) Extending the scope of CDSS to cover a wider range of clinical tasks |
| <input type="checkbox"/> e) Testing the accuracy of CDSS  |  |
| <input type="checkbox"/> j) Other activities required to help realise CDSS benefits (please specify): |  |



## Questionnaire about clinical decision support systems

### 3. Questions about concerns related to the use of CDSS

How important to your specialty are each of the following potential concerns about typical CDSS, as used in your specialty, using the following scale ?

*Not important at all to us / Fairly unimportant to us / Fairly important to us / Of major importance to us / Cannot comment*

#### 3.1 Concerns about CDSS quality:

	Not important at all to us	Fairly unimportant to us	Fairly important to us	Of major importance to us	Cannot comment
a) The accuracy of advice may be insufficient for clinical benefit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b) How extensively clinical effectiveness of CDSS has been tested	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c) Whether CDSS are based on the latest evidence	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d) The layout of CDSS screens varies from one system to another or between neighbouring Trusts, making errors likely	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e) To give a correct response, CDSS require high quality, coded patient data that is rarely available in NHS electronic patient records	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f) The CDSS output is not worded clearly can be hard to interpret	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g) CDSS can be too slow, interrupting clinical workflows or disrupting the consultation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h) CDSS can ignore patient preferences	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### 3.2 Concerns about the regulation of CDSS

	Not important at all to us	Fairly unimportant to us	Fairly important to us	Of major importance to us	Cannot comment
i) The results of validation studies can become obsolete rapidly, as some machine learning CDSS algorithms change daily as data passes through them	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
j) The results of validation studies depend on the quality of patient data available to the CDSS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
k) Some CDSS do not clearly describe their intended aim or scope of use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
l) Some CDSS do not clearly describe the level of user knowledge or experience required for safe use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
m) The rigour of regulatory requirements for CDSS is too lax compared to drugs or some medical devices	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
n) The standards for testing whether CDSS meet regulatory requirements are not open and peer reviewed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
o) The results of testing whether CDSS meet regulatory requirements should be openly available, as is the case with drugs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### 3.3 Concerns about professional practice, ethics and liability

	Not important at all to us	Fairly unimportant to us	Fairly important to us	Of major importance to us	Cannot comment
p) CDSS can embed unconscious bias, with some patient groups receiving unfair care as a result	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
q) Some CDSS act like a "black box", with no insight possible for the user about how they arrived at their advice or conclusions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
r) The legal liability of doctors who rely on CDSS advice is unclear	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
s) Some CDSS produce too many alerts or reminders, risking alert fatigue	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
t) Doctors may sometimes follow incorrect CDSS advice, even if they would make correct decisions without it	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
u) CDSS may lead to juniors following guidance uncritically	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
v) The use of CDSS may reduce training opportunities for juniors	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
w) Scarce expert clinical input is required during the design, implementation, review and updating of these systems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

x) Other concerns about CDSS quality, regulation or ethics (please specify):

Is your speciality taking, or planning to take, any action to address any of the above concerns ?

☐ Yes (please describe) ☐ No

If Yes, please describe the actions taken/to be taken



## Questionnaire about clinical decision support systems

### 4. Questions about quality standards and the evaluation of CDSS

National quality standards are set for many health technologies, such as the safety of drugs or pacemakers, by bodies such as MHRA or NICE.

Who should **set quality standards** for CDSS ?

- |   |  |
|---|--|
| <input type="checkbox"/> Regulators like MHRA         | <input type="checkbox"/> The RCP or other Colleges       |
| <input type="checkbox"/> NHS Digital                  | <input type="checkbox"/> Specialty societies             |
| <input type="checkbox"/> NICE                         | <input type="checkbox"/> Trade associations              |
| <input type="checkbox"/> NHS England                  | <input type="checkbox"/> The British Standards Institute |
| <input type="checkbox"/> Other body (please specify): |  |

Whose responsibility should it be to **test CDSS** against these quality standards ?

- |  |  |
|--|--|
| <input type="checkbox"/> Individual clinicians   | <input type="checkbox"/> NICE                            |
| <input type="checkbox"/> A local group led by the Chief Clinical Information Officer       | <input type="checkbox"/> RCP or other Colleges           |
| <input type="checkbox"/> CDSS suppliers  | <input type="checkbox"/> Professional societies          |
| <input type="checkbox"/> Regulators like the MHRA  | <input type="checkbox"/> Trade association               |
| <input type="checkbox"/> Organisations working on behalf of regulators ("Notified Bodies") | <input type="checkbox"/> The British Standards Institute |
| <input type="checkbox"/> NHS Digital   | <input type="checkbox"/> Individual NHS Trusts           |
| <input type="checkbox"/> Other organisation (please specify):                              |  |

What **three** aspects of CDSS quality need to be evaluated to assure members of your specialty that the system is fit for purpose ? [tick the 3 most important items]

- |  |  |
|--|--|
| <input type="checkbox"/> a) The extent to which the CDSS content matches current best evidence       | <input type="checkbox"/> f) Impact of the advice on clinical decisions       |
| <input type="checkbox"/> b) Ease of use of the CDSS in the clinical environment                      | <input type="checkbox"/> g) Impact of the advice on clinical actions         |
| <input type="checkbox"/> c) Acceptability of the advice, risk estimate or other output to clinicians | <input type="checkbox"/> h) Impact of the advice on patient outcomes         |
| <input type="checkbox"/> d) Accuracy of advice or risk estimate against a gold standard              | <input type="checkbox"/> i) Impact of the advice on NHS resource utilisation |
| <input type="checkbox"/> e) The ease of understanding explanations generated by the CDSS             | <input type="checkbox"/> j) The cost effectiveness of the CDSS               |
| <input type="checkbox"/> k) Other quality aspect (please specify):                                   |  |





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### 5. Final questions

Please add any further comments about CDSS that you would like to share with us and NHS England:

Finally, to whom should we speak to clarify or expand on any of the answers given above ?

Name:

Role:

Contact phone:

Contact email:

Many thanks indeed for your valuable input, which will be used to compile a report for the RCP Safety Committee and by NHS England to inform the revision of its Code of Conduct for the procurement and use of AI, CDSS and algorithms in the NHS.