



**Centrum voor  
Ethiek en  
Gezondheid**

## Digital doctors

### Summary

A great future is predicted for artificial intelligence, including in the field of healthcare. So-called medical expert systems are able to analyse large amounts of information and assist doctors in formulating a prognosis, diagnosis or treatment proposal.

The expectations of such medical expert systems are high, although these expectations have not yet been fulfilled. Developers and users are still facing technological and practical challenges and there are also issues that require ethical reflection. For example, the complexity of increasingly sophisticated expert systems comes at the expense of transparency about the data, rationale and normative choices underlying the conclusions or recommendations provided by these systems. Moreover, the use of expert systems may be at odds with the professional responsibility of doctors. On the other hand: if the systems can fulfil the expectations, would it be ethical to choose not to use them?

For the further development of these systems in a responsible manner, developers, doctors, patients and policymakers would do well to reflect on these issues and take the lessons from the practice into consideration. Medical expert systems are already being used in the healthcare sector, and in addition to their advantages, they also appear to have some unforeseen disadvantages. For example, the systems do not seem to perform as well when used for disorders or patient groups other than those they have been developed for. Testing with independent data sets could improve this situation.

It also appears that the systems can have an adverse impact on doctors' functioning and performance. Doctors may feel that consulting these systems is an inefficient interruption to their work or they may, for instance, mistakenly rely on a false outcome. It is therefore advisable that, alongside the development of expert systems, current and future doctors receive guidance in developing the skills they need to work well with these types of systems. For example, doctors must be able to estimate which cases do or do not call for consultation of an expert system. It would also be a good idea to base the development of the system not only on its own performance but also on how it performs in a complex setting, in hospitals or elsewhere. This requires mutual adaptation of the technology and of hospital routines and actions performed by doctors. Clarity about laws and regulations is also a point of special attention for the further development of medical expert systems.