

Approaching a renaissance in coma research responsibly

Paul M Matthews

This issue of *Nature Clinical Practice Neurology* includes two Viewpoint articles that highlight recent advances in coma research. Viewpoint authors Laureys and Boly are enthusiasts for the potential that new brain imaging methods offer and are impatient for the introduction of these methods into the clinic. Iles *et al.* offer a cautionary reminder of the magnitude of the task of establishing new definitions of coma state and prognosis and highlight the importance of ethically managing consequences of research in this field. These Viewpoints identify a natural tension in a debate that needs to be encouraged.

What is it all about? Language gets in the way of this debate. Although both Viewpoints use the word 'consciousness', as Iles *et al.* hint, the big philosophical problems of Consciousness are only obliquely their focus. The philosopher Nagel, in his famous essay "What is it like to be a bat?", described Consciousness as the sense of what it is like to be something (or someone) (Nagel T [1974] *Philos Rev* 83: 435–456). By contrast, the Viewpoints are concerned with the more limited clinical problem of how to identify and help those who can recover from coma.

Nonetheless, an eye to the philosophical debate helps to frame the clinical issues. Recovery from coma involves a return of the integrated, subjective sense of self that Nagel identifies as being at the core of Consciousness. Laureys and Boly highlight the opportunity to probe correlates of the subjective sense of self by assessing sustained neurophysiological responses to complex stimuli using functional MRI.

Iles *et al.* do not fail to recognize this opportunity, but emphasize that doctors and scientists have a particular responsibility to accurately represent their research findings in this emotive area. Patients' families and carers must be helped to understand the limitations of the information that new research provides. Numerous examples are cited that illustrate how prone to exaggeration and 'hype' research

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in this area can be. Such media reports raise expectations beyond what is defensible, ethical medicine and risk hurting the field.

As a scientific community, we must ensure that the optimistic vision of the future offered by Laureys and Boly is explored, while at the same time goals are set responsibly and the ethical issues are not forgotten. We also have a responsibility to engage and educate the wider public in these tasks. If we do so, advancement of the science and achieving a better level of care for our patients will be easier.

We first need to make certain that we are posing the right scientific questions. Developing further ways of testing for unequivocal evidence of self-volition is needed, for example. Designing responses that show the integration of perceptual states in the selection of action (i.e. providing evidence that the 'self' being defined is more than simply a combination of perception–action reflex loops) is another big challenge.

Clinical goals must have the potential to make an impact on the care of patients in coma states. What a difference it would make to have a new, reliable tool even just for communication of basic needs or states (e.g. pain)! In addition, we urgently need well-designed, longer-term follow-up studies that tell us whether a functional MRI probe of awareness can better define prognosis.

Finally, we need to consider the ethical dimension together with the experiments. We need to anticipate the consequences (intended and unintended) of introduction of any new work into clinical practice. For example, will interventions that enhance partial awareness risk reducing quality of life when applied in the context of very severe impairments?

A renaissance in coma research is possible, but we have a duty to apply the highest standards to the science and to be especially careful that outcomes are communicated fully and accurately.

PM Matthews is Vice President for Imaging in Drug Discovery at GlaxoSmithKline and Professor of Clinical Neurosciences at Imperial College, London, UK, and an Advisory Board member of Nature Clinical Practice Neurology.

Competing interests

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