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## VIEWS AND REVIEWS

### PERSONAL VIEW

# Why do we shine lights in the eyes of conscious patients after head injury?

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Pupil examination is a standard part of the neurological assessment of patients after head injury. The internationally recognised Advanced Trauma Life Support course teaches that Glasgow Coma Scale (GCS) score and pupillary responses should be assessed in all patients with head injuries.<sup>1</sup> Similarly, the National Institute for Health and Care Excellence (NICE) recommends that, after initial assessment in the emergency department, a patient who is normally alert (with a GCS score of 15) after head injury should have their GCS and pupils assessed half hourly for two hours, then hourly for four hours, then two hourly thereafter.<sup>2</sup>

The rationale for pupillary assessment is that changes in pupil size and reaction can indicate a rise in intracranial pressure and can help to identify the location of an intracranial haematoma.<sup>3</sup> This makes sense in patients with a severe head injury (defined as a GCS score of 3–8),<sup>1</sup> but does it also make sense in patients with a GCS score of 15?

For more than 70 years doctors have been taught that pupillary dilatation in the context of severe head injury and rising intracranial pressure is due to ipsilateral compression of the third (oculomotor) cranial nerve.<sup>4</sup> More recently, reduced blood flow in the brain stem has also been implicated.<sup>5</sup> Nevertheless, and regardless of the underlying pathophysiology, pupillary changes detected by a doctor or nurse using a pen torch are universally recognised as a late sign of injury, when intracranial pressure is raised considerably and consciousness reduced.<sup>4–7</sup> As intracranial pressure rises the conscious level will fall before any significant change in pupil size or response is detected. Thus serial examination of the pupils for evidence of raised intracranial pressure in a patient with a normal GCS score of 15 is illogical and unnecessary.

Physiological anisocoria—a minor degree of pupil asymmetry—is a common and harmless finding.<sup>8</sup> But it may be misleading and result in unnecessary reviews, observations, and even computed tomography, particularly when agreement between doctors regarding pupil reactivity is inconsistent.<sup>9</sup> Moreover, the serial examination of pupil size and response, recorded on each occasion, consumes time and resources. Nearly

350 000 patients were admitted to hospital with a head injury in the UK in 2013–14,<sup>10</sup> the majority with a GCS score of 15. If all of those with normal consciousness received the pupillary assessment recommended by NICE over a four hour period, and each assessment took one minute to complete and record, this would represent more than 25 000 hours of healthcare practitioners' time wasted every year in the UK without patient benefit.

This does not mean that patients should not have their eyes and pupil responses examined during their first clinical assessment after a head injury. A patient's eyes should be carefully examined to seek evidence of direct injury and to establish a baseline for pupil size and response. Some patients, such as those with previous eye surgery, may have a chronically dilated or unreactive pupil, and it is helpful to record this at the outset. However, after initial examination of the eyes regular and routine assessment for head injury does not need to include the size or reactivity of the pupils, unless the patient is not normally alert.

In summary, examination of pupil size and response is essential at initial assessment after head injury and routine in head injured patients with reduced consciousness. But it is not necessary, and wastes time and resources, as a regular and repeated observation in patients with a normal GCS score of 15. It can be safely discontinued in this patient group. Clinical training, documentation, and practice guidelines should be updated accordingly.

**Competing interests:** I have read and understood BMJ policy on declaration of interests and declare that I have no competing interests.

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