Summary:

Target controlled infusion (TCI) devices can be associated with significant safety concerns when used during magnetic resonance imaging (MRI). We tested the safety and compatibility of newer TCI systems in a 3-Tesla MRI environment. Two Asena PK and two Agilia TCI pumps were used to administer TCI propofol (at target blood concentrations of 0.5 and 6.0 μg.ml⁻¹) using the Marsh model under magnetic fields of up to 50 G with a T2-weighted sequence. We assessed the devices for projectile risk, accuracy of drug delivery, alarm function and effects on MR image quality. Both devices did not demonstrate any significant deflection at the tested field strengths, and performed within acceptable limits (cumulative error in total delivered volume < 3%; maximum 10-min interval error < 10%). The Asena pump caused minor artefacts on MR images. The TCI pumps tested perform well and safely implement pharmacokinetic software in a high magnetic field.