

## **MR imaging**

At the Bern University Hospital (Switzerland), MR images of multiple sclerosis (MS) patients are acquired on 3 Tesla (T) and 1.5T MR scanners (Magnetom Verio 3T, Magnetom Trio 3T, Magnetom Avanto 1.5T and Magnetom 1.5T Aera, Siemens Healthcare, Erlangen, Germany) with a standardized MS protocol. In the follow-up MRIs of MS patients, generally, the same scanner is used as at the first MRI. The entire 1.5T and 3T MS protocol encompasses (i) diffusion weighted imaging, (ii) T1-weighted MPR pre- and postgadobutrol i.v., (iii) T2-weighted imaging, (iv) 3D FLAIR imaging and (v) T1-weighted imaging postgadobutrol i.v. All patients receive gadobutrol (Gadovist (Bayer: Leverkusen, Germany))  $0.1\text{mL}\cdot\text{kg}^{-1}$  body weight. The flow rate is 5 mL/s, followed by 20mL of sodium chloride with the same flow rate. Patients are positioned comfortably in the head coil. Padding on either side of the head is used to help immobilization. The intravenous line with a long tube is put before the examination to avoid unnecessary MRI table moving during data acquisition.