Multiple sclerosis (MS) is one of the most common disabling neurological diseases in young adults. MR imaging of the central nervous system plays a crucial role in diagnosing and monitoring the disease. However, the MRI systems that are currently used in clinical practice have various shortcomings. An important shortcoming is the relatively low field strength, which limits the ability to identify small, but important changes that characterize the disease. What happens when the magnetic field strength of MRI systems is increased? This thesis examines the added value of ultrahigh-field 7 Tesla MRI for MS patients by exploring the technical benefits and investigating opportunities for clinical application.