Magnetic Resonance Imaging is sensitive to variations in tissue magnetism. In this seminar, the foundational principles utilized by MRI to utilize tissue magnetism as a diagnostic tool will be reviewed. Recent "Quantitative Susceptibility Mapping" techniques seeking to quantify changes in tissue magnetism are then introduced and discussed. Finally, two applications of MRI-based tissue magnetism measurements, neurological QSM changes after sports concussion and tissue metallosis near total hip replacements, are presented.