

Hepatic Fat % vs MRI-PDFF: Brief Interpretation

Dual-echo MRI calculator estimate: what the two numbers mean and how to report them.

Liver-only fat fraction	Spleen-normalized fat percentage
21%	17%
Calculated from hepatic in-phase and out-of-phase signal only.	Normalizes liver signal to spleen signal at each echo.

Key takeaway

Both values support hepatic steatosis, roughly in the moderate range by dual-echo estimation. The 17% value is usually the more defensible number when the in-phase and out-of-phase echoes were acquired separately, because spleen normalization helps correct acquisition-to-acquisition signal differences. The 21% value is appropriate when both echoes were obtained after a single excitation.

Why the numbers differ

The liver-only method assumes the only meaningful signal difference between echoes is fat-water cancellation. The spleen-normalized method uses the spleen as an internal reference to reduce systematic echo-to-echo effects. In this example, the spleen signal fell from 218 to 193, so the normalization lowers the estimate from about 21% to 17%.

That spread is useful: it suggests the two-point method is being affected by technical factors, ROI placement, or possibly splenic/iron-related signal effects. Therefore, avoid false precision.

How I would phrase it

Suggested report language: Moderate hepatic steatosis by dual-echo signal-intensity estimation, approximately 17-21%. If precise quantification is clinically needed, consider dedicated multiecho MRI-PDFF with R2* correction.

Grade reference table

Grade	Histologic fat (% hepatocytes with fat)	MRI-PDFF (common radiologic cutoffs)
Normal / none (S0)	<5%	<5%
Mild (S1)	5-33%	~5-10%
Moderate (S2)	33-66%	~10-17%
Severe (S3)	>66%	>17% (some use >20%)

Practical significance

The histology and MRI-PDFF scales should not be treated as interchangeable. Histology measures the percentage of hepatocytes containing fat droplets; MRI-PDFF measures proton fat fraction. A dual-echo signal-intensity estimate is not the same as a validated multiecho PDFF map, so the safest interpretation here is descriptive rather than exact.

Sources: Phillip Cheng, MD MS, Hepatic Steatosis MRI Calculator formulas and caveat; Park et al., 2022, Cutoff Values for Diagnosing Hepatic Steatosis Using MRI-PDFF (histologic grade ranges); published literature varies on exact MRI-PDFF grade boundaries, especially the moderate/severe cutoff.

Educational note: this summary is for radiology reporting context and does not replace clinical judgment.