We investigate measurement-based entanglement purification protocols (EPP) in the presence of local noise and imperfections. We derive a universal, protocol-independent threshold for the required quality of the local resource states, where we show that local noise per particle of up to 24% is tolerable. This corresponds to an increase of the noise threshold by almost an order of magnitude, based on the joint measurement-based implementation of sequential rounds of few-particle EPP. We generalize our results to multipartite EPP, where we encounter similarly high error thresholds.

[1] M. Zwerger, H.J. Briegel, and W. Dür, arXiv: 1303.2852