This talk describes the technology used to genetically alter the human germ line and assesses its medical safety (risks of involuntary genome alternations and side effects). I then discuss 1. the Mendelian case constellations, in which germ line therapy can be adequately modelled to obtain a controlled, deterministic result, and 2. the non-Mendelian cases in which this is not possible. In conclusion, I evaluate each set of cases from an ethical perspective, and show why they call for a very different ethical assessment.