We discuss the constraints satisfied by a conformal field theory which is part of a conformal manifold. Using conformal perturbation theory, we obtain a sum rule from which one can extract restrictions on the spectrum of low spin operators and on the behavior of OPE coefficients involving nearly marginal operators. We then consider large N conformal field theories admitting a gravity dual description. We combine conformal perturbation theory and loop expansion in the bulk to search for conformal manifolds beyond the leading order in large N. These results do not rely on supersymmetry, and therefore apply also outside the realm of superconformal field theories.