The current human rights framework can shield people from many of the risks associated with neurotechnological applications. However, it has been argued that we need either to articulate new rights or reconceptualize existing ones in order to prevent some of these risks. In this paper, we would like to address the recent discussion about whether current reconceptualizations of the right to mental integrity identify an ethical dimension that is not covered by existing moral and/or legal rights. The main challenge of these proposals is that they make mental integrity indistinguishable from autonomy. They define mental integrity in terms of the control we can have over our mental states, which seems to be part of the authenticity condition for autonomous action. Based on a fairly comprehensive notion of mental health (that is, a notion that goes beyond the mere absence of illness), we propose an alternative view according to which mental integrity can be characterized both as a positive right to (medical and non-medical) interventions that restore and sustain mental and neural function, and promote its development and a negative right protecting people from interventions that threaten or undermine these functions or their development. We will argue that this notion is dissociated from any form of cognitive control and therefore can be adequately dissociated from constructs such as autonomy, cognitive liberty or privacy.