Acylindrical hyperbolicity makes up a broad class of groups classically studied using geometric group theory. We take tools that have been developed for these groups and apply them to the class of CAT(0) groups to answer the question: "When is a group simultaneously acylindrically hyperbolic and CAT(0)? In doing so, we obtain a result about the kinds of CAT(0) spaces acylindrically hyperbolic groups can act on. We also give some applications. (Received September 13, 2017)