With the introduction of Statcast in 2015, baseball analytics have become more precise. Statcast allows every play to be precisely tracked and the data it generates is easily accessible through Baseball Savant, which opens the opportunity for improved performance statistics to be developed. In this paper we propose a new metric, Pitcher Effectiveness, that uses Statcast data to evaluate starting pitchers dynamically, based on the results of in-game outcomes after each pitch. The Pitcher Effectiveness metric successfully predicts instances where starting pitchers give up several runs, which we believe make it a candidate for the in-game evaluation of starting pitchers. In addition, Pitcher Effectiveness is consistent with other established metrics (e.g., ERA), which suggests that it can also be used to evaluate a pitcher’s start as a whole. (Received September 09, 2019)