Oral administration of drugs is most convenient for patients and therefore the ultimate goal when developing new medication. The physical barriers in the body, low pH of the stomach and degradation by enzymes in the gastrointestinal tract are a few of the obstacles to succeeding with oral drug delivery. Microfabricated devices show promise to overcome some of these hindrances and thereby improve the bioavailability of drugs after oral administration. There is an increasing focus on microfabricated oral drug delivery systems, and so far there have been three main groups of designs: patch-like structures, microcontainers and microwells. Here, we review the newest development in top-down microfabricated devices for oral drug delivery with coverage of the aspects of design, choice of material and fabrication techniques. Furthermore, the drug loading techniques and methods for testing are discussed. In addition, we discuss the future perspectives for microfabricated devices.