For decades, almost in any case malignant tumors were treated with the most radical approach. Even small renal tumors were treated almost exclusively by radical nephrectomy. The relatively rare cases of bilateral malignant tumors forced new approaches, such as heminephrectomy, partial nephrectomy, and tumor excision, thus reducing relevant therapy related morbidity. The good oncological outcomes lead to new routines, these surgical approaches became standard of care for small renal masses in favourable localization. With new ablative technologies becoming available, such as radiofrequency ablation, high intensity focused ultrasound, and cryosurgery, minimally-invasive treatment for small tumors of the kidney was possible. These focal therapies are currently under investigation.

The most frequent malignancy in urology is prostate cancer. To date, in organ confined stages, radical prostatectomy and external beam radiation therapy are considered state-of-the-art, recently supplemented by brachytherapy. Treatment related morbidity such as urinary incontinence and impotence, occurring in a relevant percentage even in centers of highest standards, lead to a search for additional treatment options. Growing knowledge on tumor biology gave way for completely new thoughts and prostate cancer management, such as active surveillance, which can be adequate for individual patients. In addition, originating as second-line treatment options for prostate cancer relapse after first-line radiation therapy, thermal ablation techniques became also potential treatment options for first-line therapy of locally confined prostate cancer. However, all initial trials employing these techniques were also designed as radical whole-gland-therapy. As a consequence, such treatments have the risk of complications, which are considered not acceptable for minimally-invasive therapies. Half-gland or focal therapy, which is currently under investigation in several centers, might be an answer to these problems.

A review of modalities of focal tumor therapy, ongoing studies, published literature, and the caveats and future aspects of focal tumor therapy will be presented.