

Clinical Applications of Next-Generation Sequencing for Cancer Diagnostics and Targeted Cancer Therapy

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Next-generation sequencing (NGS) is a revolutionary technology that has effectively sequence massive quantities of genomic DNA or RNA at a shorter time and a lower cost. The NGS is routinely used in oncology to tailor care for individual patient. In this review, we discuss the role of NGS how it can provide a more personalized approach to targeted cancer therapy.

A literature review was conducted via PubMed and articles were screened for publication dates within the past 10 years. Primary literature consisting of clinical trials and review articles were utilized. Search terms included “(next-generation sequencing) AND (cancer)”, “(next-generation sequencing) AND (cancer diagnostics)”, and “(next-generation sequencing) AND “(cancer therapy)”.

From the literature review, we found that NGS is indicated for daily practice as a diagnostic tool for advanced NSCLC, colon cancer, prostate cancer, cholangiocarcinoma, and some advanced rare cancers. We also found evidence suggesting that NGS is helpful in identifying actionable mutations that will, in turn, allow the patient to be matched to a more individualized cancer treatment.

As oncology care continues to move in the direction of more personalized care, the potential applications of NGS in the field of oncology will continue to evolve. Our review will help further the understanding of NGS and provide context for its value in patient care and its ability to provide an avenue for targeted therapy.