Precision oncology helps improve patient outcomes

Precision oncology can add months to the lives of Stage IV cancer patients if treatment selection is biomarker-guided. Below are results from a pooled analysis and meta-analysis comparing personalized strategies versus non-personalized strategies for overall survival.

Available targeted medicines—solid tumors

Over the last 20 years, the development of targeted therapies has accelerated and there are a large number currently available. Testing for relevant, actionable genetic alterations (biomarkers) has become a necessary and routine part of the oncology patient management process.

Biomarker development is accelerating

While it took almost 20 years for the first biomarkers (genomic alterations) to become targets of oncology precision medicines and to be routinely analyzed, there are many new candidates in late-stage clinical trials, and we can expect the spectrum to grow rapidly.

73% of medicines in oncology pipelines have associated biomarkers

Today, drugs can be selected to directly target the biological pathways causing the disease, while avoiding suboptimal therapies. Using a molecular profile of a patient’s cancer, treatment plans can be uniquely tailored to help provide the best potential outcome.

Impact of Precision Medicine in Diverse Cancers: A Meta-Analysis of Phase II Clinical Trials


Some patients benefit, some patients do not benefit, and some patients experience adverse effects.

Precision medicine is enabled by molecular profiling

Every patient is given an individualized treatment.

Gene translocations and fusions, e.g., NTRK3

Before translocation

After translocation

Gene copy number variations (CNVs), e.g., HER2

Normal

Amplification

Deletion

Insertions and deletions (indels), e.g., EGFR exon 19

Normal

Insertion

Deletion

Single-nucleotide polymorphisms (SNPs), e.g., BRAF V600E

Native

Before translocation

After translocation

Native

Insertion

Deletion

73% of medicines in oncology pipelines have associated biomarkers

Medium overall survival

(months, 95% CI)

Pooled analysis Meta-analysis

24 26 28 30 32 34

1998 1999 2001 2003 2005 2007 2009 2011 2013 2015 2018

On the near horizon