MedCity News

BioPharma

What the Radiopharmaceutical Pipeline Means for Patient Care

With increased access to cutting-edge imaging, improved treatment options, greater personalization of treatment, reduced radiation exposure, and potential for future advances, patients can expect to receive more advanced medical care tailored to their specific needs through radiopharmaceuticals.

By J.T. Ripton

The healthcare field has radically transformed thanks to scientific innovations and technological advancements. One such advancement was the creation of the cyclotron. Developed by Ernest Orlando Lawrence in the 1930s, these particle accelerators speed up the particles that make up all matter in the universe and collide them together or into a target. And without them, the field of nuclear medicine wouldn't exist.

Nuclear medicine is a medical specialty that uses radioactive tracers to diagnose and treat diseases by precisely targeting organs and tissues. In this field, small amounts of radioactive materials are administered to patients, and specialized cameras or scanners are used to capture the distribution and function of the material in the body. The first application of nuclear medicine was conducted in the 1930s using radioactive iodine to locate and treat an overactive thyroid. By

1940, radionuclides had begun to gain acceptance in clinical medicine as an alternative to conventional methods of disease diagnosis and treatment.

Since those times, nuclear medicine has rapidly developed, with many technological advancements, providing doctors with new, non-invasive, and highly accurate procedures. And one of those advancements is the development of radiopharmaceuticals.

"Radiopharmaceuticals are an integral part of modern medicine, used in a range of imaging and therapeutic procedures to help diagnose and treat various diseases," said RLS CEO Stephen Belcher. "These unique compounds are designed to deliver a targeted dose of radiation to specific tissues or organs in the body, helping physicians to visualize or treat potentially life-threatening conditions with greater accuracy and precision."

RLS is the nation's only accredited nuclear pharmacy group, and it owns and operates 31 radiopharmacies across 18 states. The company offers an extensive portfolio of diagnostic products and has become one of the fastest-growing distributors of radiopharmaceutical therapeutics. And over the last few years, the radiopharmaceutical pipeline has expanded rapidly. Today, there are nearly 400 investigational new drugs (INDs) in various stages of FDA approval.

What this growth means for patient care is the improvement of clinical outcomes never before thought possible. Following are five of them.

Increased access to cutting-edge imaging

With new radiopharmaceuticals entering the market, patients will be able to access a wider range of imaging procedures that are more advanced than traditional diagnostic tests. For example, some newer radiopharmaceuticals can detect the spread of cancer earlier and more accurately than standard imaging exams. This is accomplished by having the radioactive component of the drug target specific cancer cells, enabling doctors to visualize and pinpoint the exact location of the tumor in the body.

"Radiopharmaceutical diagnostics is one of the areas where the latest advancements have proven to be game-changers," Belcher said. "The development of radioisotopes like Ga-68 and others, that have short half-lives, makes it possible to perform scans at various intervals over hours and days—each scan showing the progression of a disease and helping doctors evaluate the effectiveness of a specific treatment."

Better disease monitoring

Radiopharmaceuticals have not only allowed for the development of early detection opportunities but also enabled disease monitoring for various diseases. The precise targeting of diseased cells or cancer cells with the help of radiopharmaceuticals allows for disease progression to be monitored closely.

"Until recently, the monitoring process was painful and time-consuming, involving multiple invasive biopsies and tests for each stage of the disease, which often led to inaccurate readings

and false negatives," Belcher added. "Radiopharmaceuticals make it possible to follow how a particular disease is progressing, evaluate the effectiveness of each treatment within days, compared to the current process that could take months."

Improved treatment options

In addition to improved imaging capabilities, radiopharmaceuticals are being developed for therapeutic purposes. This means that instead of simply detecting diseases, they can be used to treat them directly. One such example of this is the use of radiopharmaceuticals to destroy cancer cells safely and effectively. One example is Lu-177 vipivotide tetraxetan, which has significantly improved the treatment of prostate-specific membrane antigen-positive metastatic castration-resistant prostate cancer.

"The great thing about radiopharmaceuticals is that they can be tailored to specific diseases," said Belcher. "This level of personalization can help ensure that patients receive the most effective treatments possible."

The actualization of precision medicine

The improving radiopharmaceutical pipeline is also paving the way for precision medicine. These therapeutic and diagnostic drugs are great at targeting specific molecules on cells or other targeted tissues, allowing the treatment only to impact those tissues while leaving other parts unharmed. These targeted treatments are a departure from the one-size-fits-all approach of traditional treatments and have been shown to increase the quality of life for patients.

"As medicine becomes more precise, radiopharmaceuticals are likely to play an increasingly important role in treating certain diseases," explained Belcher. "Researchers continue exploring new ways to use these drugs to diagnose and treat diseases. And the improving pipeline is paving the way for precision medicine, offering hope to patients with few treatment options."

Reduced radiation exposure

Safety is always a concern when it comes to radiation-based procedures. However, with advances in radiopharmaceuticals, the amount of radiation exposure required for accurate imaging or treatment has been significantly reduced. This means patients can access advanced diagnostic and therapeutic procedures while minimizing their exposure to harmful radiation.

"Radiation-based procedures can be daunting, but with the advancement of radiopharmaceuticals and careful safety measures, patients can have access to advanced diagnosis and treatments without the risk of severe radiation exposure," said Belcher.

Final thoughts

As the radiopharmaceutical pipeline continues to grow, there is potential for even more significant improvements in patient care. For example, researchers are currently working on developing radiopharmaceuticals that can be used to detect and treat diseases such as

Alzheimer's and Parkinson's disease. These advances could have a significant impact on the lives of millions of patients worldwide.

As such, the growing radiopharmaceutical pipeline represents a significant opportunity for improved patient care. With increased access to cutting-edge imaging, improved treatment options, greater personalization of treatment, reduced radiation exposure, and potential for future advances, patients can expect to receive more advanced medical care tailored to their specific needs. It is essential that healthcare professionals stay informed and up to date on these developments to provide patients with the best possible care.

Photo:boonchai wedmakawand, Getty Images