

# Personalized Treatment Approaches in Metastatic Triple-negative Breast Cancer: A Pharmacist's Perspective

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## Introduction

Metastatic triple-negative breast cancer is a highly aggressive and challenging form of breast cancer to treat. It accounts for approximately 15% of all breast cancer cases and has a high incidence in younger women, African Americans, and BRCA1 mutation carriers. The term "triple-negative" refers to the absence of Estrogen Receptor (ER), Progesterone Receptor (PR), and human epidermal growth factor receptor expression on tumor cells, which limits the treatment options available for this type of breast cancer [1]. In this article, we will discuss the current therapeutic strategies for mTNBC from the perspective of pharmacists. Chemotherapy remains the standard of care for. The National Comprehensive Cancer Network recommends a combination of and anthracycline-based chemotherapy as first-line treatment for mTNBC. For patients who have previously received anthracycline and taxane-based chemotherapy, options include eribulin, , and gemcitabine. These chemotherapy agents are associated with significant side effects, including myelosuppression, neuropathy, fatigue, and nausea, which can impact patients' quality of life.

## Description

In recent years, immune checkpoint inhibitors have emerged as a promising therapeutic option for mTNBC. Immune checkpoint inhibitors, such as pembrolizumab and atezolizumab, block the interaction between programmed cell death 1 (PD-1) and programmed death-ligand 1 (PD-L1), which inhibits T-cell activation and promotes tumor cell evasion of the immune system. Clinical trials have shown that pembrolizumab in combination with chemotherapy significantly improves progression-free survival and overall survival in patients with mTNBC who express PD-L1. Poly (ADP-Ribose) Polymerase (PARP) inhibitors have also shown promise in the treatment of mTNBC. PARP inhibitors, such as olaparib and talazoparib, target cancer cells with defects in homologous recombination repair (HRR), which are more common in patients with BRCA1/2 mutations. Clinical trials have shown that olaparib improves progression-free survival in patients with mTNBC who have germline BRCA1/2 mutations [2].

In addition to chemotherapy, immune checkpoint inhibitors, and PARP inhibitors, other targeted therapies are under investigation for mTNBC. These include antibody-drug conjugates, such as sacituzumab govitecan, which targets Trop-2, a cell surface protein overexpressed in mTNBC, and kinase inhibitors, such as dasatinib, which targets multiple tyrosine kinases involved in breast cancer growth and metastasis. Pharmacists play a critical role in the management of mTNBC. They work closely with oncologists to ensure that patients receive appropriate treatment, manage treatment-related side effects, and monitor for potential drug interactions. Pharmacists also provide patient education on medication use, adherence, and self-care strategies [3].

Chemotherapy remains the primary treatment for metastatic TNBC.

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However, unlike other types of breast cancer, TNBC is generally more responsive to chemotherapy. The standard chemotherapy regimen for metastatic TNBC is a combination of anthracyclines and taxanes. However, this regimen is associated with significant toxicity and side effects, such as bone marrow suppression, neuropathy, and cardiotoxicity. To minimize toxicity, pharmacists play an important role in ensuring that patients receive the appropriate supportive care, such as antiemetics, growth factors, and cardioprotective agents..

Immunotherapy has emerged as a promising treatment option for metastatic TNBC. The immune checkpoint inhibitor pembrolizumab was recently approved by the US Food and Drug Administration (FDA) for the treatment of metastatic TNBC. Pembrolizumab targets the programmed cell death protein 1 (PD-1) receptor on immune cells, which allows cancer cells to evade the immune system. By blocking this receptor, pembrolizumab enables the immune system to recognize and attack cancer cells. Pharmacists play a critical role in managing the side effects associated with immunotherapy, such as immune-related adverse events, including colitis, pneumonitis, and thyroid dysfunction.

Targeted therapies aim to specifically target the molecular characteristics of cancer cells. Poly ADP Ribose Polymerase (PARP) inhibitors have shown efficacy in the treatment of metastatic TNBC. PARP inhibitors target the DNA repair pathway in cancer cells, which is often dysregulated in TNBC. Olaparib and talazoparib are two PARP inhibitors that have been approved by the FDA for the treatment of metastatic TNBC. Pharmacists play a crucial role in managing the side effects of PARP inhibitors, such as myelosuppression, nausea [4,5].

## Conclusion

In conclusion, mTNBC is a challenging form of breast cancer to treat, and the therapeutic options available are limited. Chemotherapy remains the standard of care, but immune checkpoint inhibitors and PARP inhibitors have emerged as promising therapeutic options. Other targeted therapies are also under investigation. Pharmacists play a critical role in the management of mTNBC and work closely with oncologists to ensure that patients receive appropriate treatment and manage treatment-related side effects.

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## Conflict of Interest

None.

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