

# BREAST CANCER CHEMOTHERAPY REGIMENS (Part 1 of 3)

The selection, dosing, and administration of anti-cancer agents and the management of associated toxicities are complex. Drug dose modifications and schedule and initiation of supportive care interventions are often necessary because of expected toxicities and because of individual patient variability, prior treatment, and comorbidities. Thus, the optimal delivery of anti-cancer agents requires a healthcare delivery team experienced in the use of such agents and the management of associated toxicities in patients with cancer. The chemotherapy regimens below may include both FDA-approved and unapproved uses/regimens and are provided as references only to the latest treatment strategies. Clinicians must choose and verify treatment options based on the individual patient.

## GENERAL TREATMENT NOTES

- All trastuzumab-containing regimens require cardiac monitoring at baseline and at Months 3, 6, and 9<sup>1</sup>.

REGIMEN	DOSING
<b>ADJUVANT THERAPY WITH CONCOMITANT TRASTUZUMAB<sup>1</sup></b>	
AC (doxorubicin [Adriamycin] + cyclophosphamide [Cytoxan]) followed by paclitaxel (Taxol) + concurrent trastuzumab (Herceptin) <sup>1,2</sup>	<p><u>Cycles 1-4</u>  <b>Day 1:</b> Doxorubicin 60mg/m<sup>2</sup> IV + cyclophosphamide 600mg/m<sup>2</sup> IV; repeat cycle every 21 days for 4 cycles  <u>Subsequent cycles</u>  <b>Day 1:</b> Paclitaxel 80mg/m<sup>2</sup> IV once weekly for 12 weeks, plus  <b>Day 1:</b> Trastuzumab 4mg/kg IV loading dose, then trastuzumab 2mg/kg IV once weekly (or trastuzumab 6mg/kg IV once every 21 days) to complete 1 year of treatment<sup>1,2</sup> or</p> <hr/> <p><u>Cycles 1-4</u>  <b>Day 1:</b> Doxorubicin 60mg/m<sup>2</sup> IV + cyclophosphamide 600mg/m<sup>2</sup> IV; repeat cycle every 21 days for 4 cycles  <u>Subsequent cycles</u>  <b>Day 1:</b> Paclitaxel 175mg/m<sup>2</sup> IV, repeat cycle every 21 days for 4 cycles, plus  <b>Day 1:</b> Trastuzumab 4mg/kg IV loading dose, then trastuzumab 2mg/kg IV once weekly (or trastuzumab 6mg/kg IV once every 21 days) to complete 1 year of treatment</p>
Dose-dense AC (doxorubicin + cyclophosphamide) followed by paclitaxel + concurrent trastuzumab <sup>1,3</sup>	<p><u>Cycles 1-4</u>  <b>Day 1:</b> Doxorubicin 60mg/m<sup>2</sup> IV + cyclophosphamide 600mg/m<sup>2</sup> IV; repeat cycle every 14 days for 4 cycles  <u>Subsequent cycles</u>  <b>Day 1:</b> Paclitaxel 175mg/m<sup>2</sup> IV administered over 3 hrs followed by pegfilgrastim 6mg SC one day after; repeat cycle every 14 days for 4 cycles, plus  <b>Day 1:</b> Trastuzumab 4mg/kg IV loading dose, then trastuzumab 2mg/kg IV once weekly (or trastuzumab 6mg/kg IV once every 21 days) to complete 1 year of treatment</p>
Docetaxel (Taxotere) + concurrent trastuzumab <sup>4</sup>	<p><u>Cycles 1-8</u>  <b>Day 1:</b> Docetaxel 100mg/m<sup>2</sup> IV, plus  <b>Days 1, 8, 15:</b> Trastuzumab 2mg/kg; repeat cycle every 21 days for 8 cycles  <u>Subsequent cycles</u>  <b>Day 1:</b> Trastuzumab 4mg/kg IV loading dose, then trastuzumab 6mg/kg IV once every 21 days until disease progression or cumulative toxicity</p>
Docetaxel + concurrent trastuzumab followed by FEC (5-fluorouracil [5-FU] + epirubicin [Ellence] + cyclophosphamide) <sup>5</sup>	<p><u>Weeks 1-8</u>  <b>Day 1:</b> Docetaxel 100mg/m<sup>2</sup> IV; repeat cycle every 21 days for 3 cycles, plus  <b>Day 1:</b> Trastuzumab 4mg/kg IV loading dose, then trastuzumab 2mg/kg IV once weekly for 8 weeks  <u>Subsequent cycles</u>  <b>Day 1:</b> 5-FU 600mg/m<sup>2</sup> IV + epirubicin 60mg/m<sup>2</sup> IV + cyclophosphamide 600mg/m<sup>2</sup> IV; repeat cycle every 21 days for 3 cycles</p>
<b>ADJUVANT THERAPY WITHOUT CONCOMITANT TRASTUZUMAB</b>	
TAC (docetaxel + doxorubicin + cyclophosphamide) <sup>6</sup>	<p><b>Day 1:</b> Doxorubicin 50mg/m<sup>2</sup> IV, then cyclophosphamide 500mg/m<sup>2</sup> IV, then after a 1-hr interval docetaxel 75mg/m<sup>2</sup> IV, plus  <b>Days 4-11:</b> Lenograstim 150mcg/m<sup>2</sup>/day or filgrastim 5mcg/kg/day; repeat cycle every 21 days for 6 cycles</p>
AC (doxorubicin + cyclophosphamide + paclitaxel) <sup>7</sup>	<p><u>Cycles 1-4</u>  <b>Day 1:</b> Doxorubicin 60mg/m<sup>2</sup> IV + cyclophosphamide 600mg/m<sup>2</sup> IV; repeat cycle every 21 days for 4 cycles  <u>Subsequent cycles</u>  <b>Day 1:</b> Paclitaxel 80mg/m<sup>2</sup> IV once weekly for 12 weeks</p>
Dose-dense AC (doxorubicin + cyclophosphamide) followed by paclitaxel <sup>8</sup>	<p><b>Day 1:</b> Doxorubicin 60mg/m<sup>2</sup> IV + cyclophosphamide 600mg/m<sup>2</sup> IV + paclitaxel 175mg/m<sup>2</sup> IV, plus  <b>Days 3-10:</b> Filgrastim 5mcg/kg (total 300mcg or 480mcg); repeat cycle every 14 days for 4 cycles</p>
TC (docetaxel + cyclophosphamide) <sup>9</sup>	<p><b>Day 1:</b> Docetaxel 75mg/m<sup>2</sup> IV + cyclophosphamide 600mg/m<sup>2</sup> IV; repeat cycle every 21 days for 4 cycles</p>

(continued)

# BREAST CANCER CHEMOTHERAPY REGIMENS (Part 2 of 3)

REGIMEN	DOSING
<b>NEOADJUVANT THERAPY</b>	
Trastuzumab + paclitaxel + FEC (5-FU + epirubicin + cyclophosphamide) <sup>10</sup>	<p><u>Cycles 1–4</u>  <b>Day 1:</b> Trastuzumab 4mg/kg IV for one dose (for first dose, administer 1 day before paclitaxel to monitor for infusion reactions), then trastuzumab 2mg/kg once weekly for 24 weeks total, plus  <b>Day 1:</b> Paclitaxel 225mg/m<sup>2</sup> continuous IV infusion over 24 hrs; repeat cycle every 21 days for 4 cycles  <u>Subsequent cycles</u>  <b>Day 1:</b> Epirubicin 75mg/m<sup>2</sup> IV + cyclophosphamide 500mg/m<sup>2</sup> IV, plus  <b>Days 1 and 3:</b> 5-FU 500mg/m<sup>2</sup> IV; repeat cycle every 21 days for 4 cycles</p>
<b>RECURRENT OR METASTATIC BREAST CANCER—COMBINATION THERAPY</b>	
FEC (5-FU + epirubicin + cyclophosphamide) <sup>11</sup>	<b>Days 1 and 8:</b> 5-FU 500mg/m <sup>2</sup> IV + epirubicin 50mg/m <sup>2</sup> IV + cyclophosphamide 400mg/m <sup>2</sup> IV; repeat cycle every 21 or 28 days for 6–9 cycles
EC (epirubicin + cyclophosphamide) <sup>12</sup>	<b>Day 1:</b> Epirubicin 75mg/m <sup>2</sup> IV + cyclophosphamide 600mg/m <sup>2</sup> IV; repeat cycle every 21 days
AT (doxorubicin + docetaxel) <sup>13</sup>	<b>Day 1:</b> Doxorubicin 50mg/m <sup>2</sup> IV + docetaxel 75mg/m <sup>2</sup> IV; repeat cycle every 21 days for max 8 cycles
Docetaxel + capecitabine (Xeloda) <sup>14</sup>	<b>Day 1:</b> Docetaxel 75mg/m <sup>2</sup> IV, plus <b>Days 1–14:</b> Capecitabine 1,250 mg/m <sup>2</sup> (patients ≥60 yrs: reduce to 950mg/m <sup>2</sup> ) orally twice daily; repeat cycle every 21 days
GT (paclitaxel+ gemcitabine [Gemzar]) <sup>15</sup>	<b>Day 1:</b> Paclitaxel 175mg/m <sup>2</sup> IV, plus <b>Days 1 and 8:</b> Gemcitabine 1,250mg/m <sup>2</sup> IV; repeat cycle every 21 days
<b>RECURRENT OR METASTATIC BREAST CANCER—SINGLE-AGENT THERAPY</b>	
Pegylated liposomal encapsulated doxorubicin (PLD; Doxil) <sup>16</sup>	<b>Day 1:</b> PLD 50mg/m <sup>2</sup> IV; repeat cycle every 28 days
Albumin-bound paclitaxel (Abraxane) <sup>17</sup>	<b>Day 1:</b> Albumin-bound paclitaxel 260mg/m <sup>2</sup> IV; repeat cycle every 21 days
Capecitabine <sup>18</sup>	<b>Days 1–14:</b> Capecitabine 1,000–1,250mg/m <sup>2</sup> orally twice daily; repeat cycle every 21 days
<b>RECURRENT OR METASTATIC BREAST CANCER WITH CONCOMITANT BEVACIZUMAB (AVASTIN)</b>	
Paclitaxel + bevacizumab <sup>19</sup>	<b>Days 1, 8, and 15:</b> Paclitaxel 90mg/m <sup>2</sup> IV (reduce to 65mg/m <sup>2</sup> if toxicity occurs), plus <b>Days 1 and 15:</b> Bevacizumab 10mg/kg IV; repeat cycle every 28 days.
<b>RECURRENT OR METASTATIC HER2+ BREAST CANCER—FIRST-LINE AGENTS WITH CONCOMITANT TRASTUZUMAB</b>	
TPC (trastuzumab + paclitaxel + carboplatin [Paraplatin]) <sup>20</sup>	<p><u>Cycle 1</u>  <b>Day 1:</b> Trastuzumab 4mg/kg IV, then  <b>Day 2:</b> Paclitaxel 175mg/m<sup>2</sup> IV + carboplatin AUC= 6mg/mL/min IV, then  <b>Days 8 and 15:</b> Trastuzumab 2mg/kg IV  <u>Subsequent cycles</u>  <b>Days 1, 8, and 15:</b> Trastuzumab 2mg/kg IV, then  <b>Day 2:</b> Paclitaxel 175mg/m<sup>2</sup> IV + carboplatin AUC= 6mg/mL/min; repeat cycle every 21 days. After chemotherapy, administer trastuzumab 2mg/kg IV weekly until disease progression or other discontinuation event occurs</p>
Paclitaxel + trastuzumab	<p><b>Day 1:</b> Paclitaxel 175mg/m<sup>2</sup> IV; repeat every 21 days for 6 cycles, plus  <b>Day 1:</b> Trastuzumab 4mg/kg IV loading dose, followed by trastuzumab 2mg/kg IV once weekly until disease progression<sup>21</sup> or</p> <hr style="border-top: 1px dashed black;"/> <p><b>Day 1:</b> Paclitaxel 80mg/m<sup>2</sup> IV once weekly, repeat cycle every 21 days, plus  <b>Day 1:</b> Trastuzumab 4mg/kg IV loading dose, followed by trastuzumab 2mg/kg IV once weekly for at least 2 cycles until disease progression<sup>22</sup></p>
Docetaxel + trastuzumab	<p><b>Day 1:</b> Docetaxel 100mg/m<sup>2</sup> IV; repeat cycle every 21 days for 6 cycles, plus  <b>Day 1:</b> Trastuzumab 4mg/kg IV loading dose, followed by trastuzumab 2mg/kg IV once weekly until disease progression<sup>23</sup> or</p> <hr style="border-top: 1px dashed black;"/> <p><b>Days 1, 8, and 15:</b> Docetaxel 35mg/m<sup>2</sup> IV and trastuzumab 2mg/kg IV (first dose: give trastuzumab 4mg/kg as loading dose); repeat cycle every 28 days until disease progression<sup>24</sup></p>
Vinorelbine (Navelbine) + trastuzumab <sup>25</sup>	<p><b>Day 1:</b> Vinorelbine 2mg/m<sup>2</sup> IV once weekly for 8 weeks, plus  <b>Day 1:</b> Trastuzumab 4mg/kg IV loading dose, followed by trastuzumab 2mg/kg IV once weekly until disease progression</p>

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REGIMEN	DOSING
<b>RECURRENT OR METASTATIC HER2+ BREAST CANCER—FIRST-LINE AGENTS WITH CONCOMITANT TRASTUZUMAB (cont'd)</b>	
Capecitabine + trastuzumab <sup>26</sup>	<b>Days 1–14:</b> Capecitabine 1,250mg/m <sup>2</sup> orally twice daily; repeat cycle every 3 weeks, plus <b>Day 1:</b> Trastuzumab 8mg/kg IV loading dose, followed by trastuzumab 6mg/kg IV once every 3 weeks
Lapatinib (Tykerb) + trastuzumab for trastuzumab-exposed HER-2 positive disease <sup>27</sup>	<b>Day 1:</b> Lapatinib 1,000mg orally once daily, plus <b>Day 1:</b> Trastuzumab 4mg/kg IV loading dose, then trastuzumab 2mg/kg IV once weekly until disease progression

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