# Complete Summary

## GUIDELINE TITLE

American Society of Clinical Oncology 2007 update recommendations for the use of tumor markers in breast cancer.

## BIBLIOGRAPHIC SOURCE(S)

Harris L, Fritsche H, Mennel R, Norton L, Ravdin P, Taube S, Somerfield MR, Hayes DF, Bast RC Jr, American Society of Clinical Oncology. American Society of Clinical Oncology 2007 update of recommendations for the use of tumor markers in breast cancer. J Clin Oncol 2007 Nov 20;25(33):5287-312. [321 references] PubMed

## GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: Bast RC, Ravdin P, Hayes DF, Bates S, Fritsche H, Jessup JM, Kemeny N, Locker GY, Mennel RG, Somerfield MR. 2000 update of recommendations for the use of tumor markers in breast and colorectal cancer: clinical practice guidelines of the American Society of Clinical Oncology. J Clin Oncol 2001 Mar 15;19(6):1865-78.

ASCO guidelines are updated annually by a Review Committee of the full Guidelines Expert Panel, and every 3 years by the full Panel.

## COMPLETE SUMMARY CONTENT

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## SCOPE

### DISEASE/CONDITION(S)

Breast cancer, including:

- Ductal carcinoma in situ (DCIS)
- Invasive breast cancer
- Node-negative breast cancer
- Metastatic breast cancer
- Recurrent breast cancer

## GUIDELINE CATEGORY

Diagnosis
Evaluation
Prevention
Risk Assessment
Screening

## CLINICAL SPECIALTY

Oncology

## INTENDED USERS

Physicians

## GUIDELINE OBJECTIVE(S)

- To update the recommendations for the use of tumor marker tests in the prevention, screening, treatment, and surveillance of breast cancer
- To expand the scope of the guideline to include a broader range of markers in breast cancer and to consider the impact of genomic technologies

## TARGET POPULATION

Patients with suspected or confirmed breast cancer

## INTERVENTIONS AND PRACTICES CONSIDERED

### Use of Tumor Markers in Breast Cancer Evaluation, Screening, Diagnosis, Staging, or Surveillance

1. Serum cancer antigen (CA) 15-3 and CA 27.29 (selected applications)
2. Serum carcinoembryonic antigen (CEA) (selected applications)
3. Estrogen and progesterone receptors (ER/PgR) (selected applications)
4. DNA flow cytometry-based proliferation markers (considered but not recommended)
5. Immunohistochemically based markers of proliferation (considered but not recommended)
6. Human epidermal growth factor receptor 2 (HER2) (selected applications)
7. p-53 tumor suppressor gene (considered but not recommended)
8. Urokinase plasminogen activator (uPA) and plasminogen activator inhibitor (PAI-1) (selected applications)
9. Cathepsin-D (considered but not recommended)
10. Cyclin E fragments (considered but not recommended)

11. Proteomic analysis (considered but not recommended)
12. Multiparameter gene expression analysis (e.g., Oncotype DX )(considered but not recommended)
13. Bone marrow micrometastases (considered but not recommended)
14. Circulating tumor cell assays (considered but recommended against)

### MAJOR OUTCOMES CONSIDERED

- Clinical utility
- Overall survival
- Disease-free survival
- Toxicity
- Quality of life
- Cost-effectiveness of care

## METHODOLOGY

### METHODS USED TO COLLECT/SELECT EVIDENCE

Hand-searches of Published Literature (Primary Sources)
Searches of Electronic Databases

### DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

Pertinent information published from 1999 through February 2006 was reviewed for markers that were included in the last update of the guideline; information from 1966 to February 2006 was reviewed for the new markers. The MEDLINE database (National Library of Medicine, Bethesda, MD) was searched to identify relevant information from the published literature for this update. A series of searches was conducted using the medical subject headings or text words for each of the markers with the medical subject heading "breast neoplasms" and related text words. Search results were limited to human studies and English-language articles; editorials, letters, and commentaries were excluded from consideration. The Cochrane Library was searched for available systematic reviews and meta-analyses with the phrases "tumor markers" and "biomarkers." Directed searches based on the bibliographies of primary articles were also performed. Finally, Update Committee members contributed articles from their personal collections. Update Committee members reviewed the resulting abstracts and titles that corresponded to their assigned sections. Inclusion criteria were broad. Update Committee members focused attention on systematic reviews and meta-analyses, and on studies that considered markers in relation to American Society of Clinical Oncology (ASCO) clinical outcomes for guideline and technology assessment (overall survival, disease-free survival, quality of life, toxicity, and cost-effectiveness).

### NUMBER OF SOURCE DOCUMENTS

Not stated

### METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Expert Consensus
Weighting According to a Rating Scheme (Scheme Not Given)

## RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

A modification of the scale developed by the Canadian Task Force on the Periodic Health Examination was used:

**Level I**: Evidence from meta-analysis or large, high-powered concurrently controlled studies in which the primary objective of the trial design was to test the utility of the marker

**Level II**: Evidence was obtained from prospective clinical trials designed to test a therapeutic hypothesis in which tumor marker evaluation was a secondary, but prospectively described objective

**Level III**: Studies were retrospective, but characterized by large size (greater than 200 patients per subgroup) and/or by inclusion of multivariate analysis

**Level IV**: Evidence was considered less reliable than level III evidence, either because the study was smaller or a multivariate analysis was not provided

**Level V**: Evidence was derived from studies that were small, retrospective, and not designed to correlate marker results with clinical outcome

## METHODS USED TO ANALYZE THE EVIDENCE

Review of Published Meta-Analyses
Systematic Review with Evidence Tables

## DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

The Update Committee has attempted to review tumor markers in reference to a Levels of Evidence framework, which defines the quality of the data on a given marker. Most published studies could be designated as Level of Evidence III (evidence from large but retrospective studies), which may generate hypotheses but are insufficient to change clinical practice. The Update Committee attempted, wherever possible, to base the updated recommendations on studies deemed to be Level of Evidence II (prospective therapeutic trials in which marker utility is a secondary study objective), or, ideally, Level of Evidence I (single, high-powered, prospective, randomized controlled trials specifically designed to test the utility of the marker or meta-analyses of well-designed studies).

## METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

## DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

For the 2007 update, an Update Committee composed of members from the full Panel was formed to complete the review and analysis of data published since 1999. The Update Committee had two face-to-face meetings to consider the evidence for each of the 2000 recommendations.

## RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

## COST ANALYSIS

A cost-utility analysis applying a Markov decision analytic model was used to forecast overall survival, costs, and cost-effectiveness of using the Onco*type* DX test (a reverse transcriptase-polymerase chain reaction assay that measures the expression of 21 genes) in practice. Fifty-three patients (8% of the total population studied) who had been enrolled onto The National Surgical Adjuvant Breast and Bowel Project (NSABP) B-14 were classified as having a low risk of distant recurrence by National Comprehensive Cancer Network (NCCN) clinical guidelines. The application of Onco*type* DX reclassified 15 of these patients (28%) to an intermediate- or high-risk group. The remaining 615 patients (92% of the total population studied) were classified as high risk by NCCN guidelines. The test reclassified 300 of these patients (49%) to a low risk group. These data and estimates of benefits of therapy (tamoxifen and chemotherapy) from published overview analyses were used to examine the potential impact of using Onco*type* DX to make treatment decisions, instead of NCCN criteria, for 100 theoretical US patients. The authors calculated that using Onco*type* DX would result in an average increase in quality-adjusted survival of 8.6 years and a reduction in overall costs of $202,828.

## METHOD OF GUIDELINE VALIDATION

External Peer Review
Internal Peer Review

## DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

The content of the guidelines and the manuscript were reviewed and approved by the Health Services Research Committee and by the American Society of Clinical Oncology (ASCO) Board.

The updated recommendations were approved by the Board of Directors Executive Committee on July 12, 2007.

# RECOMMENDATIONS

## MAJOR RECOMMENDATIONS

**Summary of Recommendations**
**for the Use of Tumor Markers in Breast Cancer**

| Specific Marker | 2007 Recommendation |
| --- | --- |
| *Cancer antigen (CA) 15-3 and CA 27.29 as markers for breast cancer as screening, diagnostic, or staging tests* | Present data are insufficient to recommend CA 15-3 or CA 27.29 for screening, diagnosis, and staging. **There is no change from the guideline published in 2000.** |
| *CA 15-3 and CA 27.29 to detect recurrence after primary breast cancer therapy* | Present data do not support the use of CA 15-3 and CA 27.29 for monitoring patients for recurrence after primary breast cancer therapy. **There is no change from the guideline published in 2000.** |
| *CA 15-3 and CA 27.29 to contribute to decisions regarding therapy for metastatic breast cancer* | For monitoring patients with metastatic disease during active therapy, CA 27.29 or CA 15-3 can be used in conjunction with diagnostic imaging, history, and physical examination. Present data are insufficient to recommend use of CA 15-3 or CA 27.29 alone for monitoring response to treatment. However, in the absence of readily measurable disease, an increasing CA 15-3 or CA 27.29 may be used to indicate treatment failure. Caution should be used when interpreting a rising CA 27.29 or CA 15-3 level during the first 4-6 weeks of a new therapy, since spurious early rises may occur. **There is no change from the guideline published in 2000.** |
| *Carcinoembryonic antigen (CEA) for screening, diagnosis, staging, or routine surveillance of breast cancer patients after primary therapy* | CEA is not recommended for screening, diagnosis, staging, or routine surveillance of breast cancer patients after primary therapy. **There is no change from the guideline published in 2000.** |
| *CEA to contribute to decisions regarding therapy for metastatic breast cancer* | For monitoring patients with metastatic disease during active therapy, CEA can be used in conjunction with diagnostic imaging, history, and physical examination. Present data are insufficient to recommend use of CEA alone for monitoring response to treatment. However, in the absence of readily measurable disease, an increasing CEA may be used to indicate treatment failure. Caution should be used when interpreting a rising CEA level during the first 4-6 weeks of a new therapy, since spurious early rises may occur. **There is** |

| Summary of Recommendations for the Use of Tumor Markers in Breast Cancer | |
|---|---|
| **Specific Marker** | **2007 Recommendation** |
| | **no change from the guideline published in 2000.** |
| *Estrogen receptors (ERs) and progesterone receptors (PgRs)* | ER and PgR should be measured on every primary invasive breast cancer and may be measured on metastatic lesions if the results would influence treatment planning. In both pre-and postmenopausal patients, steroid hormone receptor status should be used to identify patients most likely to benefit from endocrine forms of therapy in both the early breast cancer and metastatic disease settings. In patients with ductal carcinoma in situ (DCIS) who are candidates for hormonal therapy, data are insufficient to recommend routine measurement of ER and PgR for therapy recommendations. |
| *DNA flow cytometry–based parameters* | Present data are insufficient to recommend use of DNA content, S phase, or other flow cytometry–based markers of proliferation to assign patients to prognostic groups. **There is no change from the guideline published in 2000.** |
| *Immunohistochemically based markers of proliferation (Note: This topic is new to the guideline)* | Present data are insufficient to recommend measurement of Ki67, cyclin D, cyclin E, p27, p21, thymidine kinase, topoisomerase II, or other markers of proliferation to assign patients to prognostic groups. |
| *Human epidermal growth factor receptor 2 (HER2) evaluation in breast cancer* | HER2 expression and/or amplification should be evaluated in every primary invasive breast cancer either at the time of diagnosis or at the time of recurrence, principally to guide selection of trastuzumab in the adjuvant and/or metastatic setting. Other utilities for HER2 evaluation are also discussed separately below. |
| *HER2 to define prognosis for early stage breast cancer patients in the* | HER2 amplification, overexpression, and the presence of HER2 extracellular domain are |

| Summary of Recommendations for the Use of Tumor Markers in Breast Cancer | |
|---|---|
| **Specific Marker** | **2007 Recommendation** |
| *absence of systemic therapy* | generally associated with a poorer prognosis. However, the value of this information in clinical practice is questionable and the use of HER2 for determining prognosis is not recommended. **There is no change from the guideline published in 2000.** |
| *HER2 to select patients for anti-HER2–based therapy* | High levels of tissue HER2 expression or HER2 gene amplification should be used to identify patients for whom trastuzumab may be of benefit for treatment of breast cancer in the adjuvant or metastatic disease settings. **There is no change from the guideline published in 2000.** |
| *The utility of HER2 for predicting response to specific chemotherapeutic agents* | Level II evidence (prospective therapeutic trials in which marker utility is a secondary study objective) suggests that overexpression of HER2 (3+ by protein or >2.0 fluorescent in situ hybridization [FISH] ratio by gene amplification) identifies patients who have greater benefit from anthracycline-based adjuvant therapy. If a clinician is considering chemotherapy for a patient with HER2-positive breast cancer, it is recommended that an anthracycline be strongly considered, assuming there are no contraindications to anthracycline therapy. In the context of trastuzumab therapy, there is Level I evidence (single, high-powered, prospective, randomized, controlled trials specifically designed to test the marker or a meta-analyses of well-designed studies) that a nonanthracycline regimen may produce similar outcomes. At present, the Update Committee does not recommend that HER2 be used to guide use of taxane chemotherapy in the adjuvant setting. |
| *HER2 to determine sensitivity to endocrine therapy* | HER2 should not be used to withhold endocrine therapy for a patient with hormone receptor–positive breast cancer, nor should it be used to select one specific type of |

| Summary of Recommendations for the Use of Tumor Markers in Breast Cancer | |
|---|---|
| **Specific Marker** | **2007 Recommendation** |
| | endocrine therapy over another. **There is no change from the guideline published in 2000.** |
| *Utility of circulating extracellular domain of HER-2* | Measuring circulating extracellular domain of HER2 is not currently recommended for any clinical setting. **There is no change from the guideline published in 2000.** |
| *p53 as a marker for breast cancer* | Present data are insufficient to recommend use of p53 measurements for management of patients with breast cancer. **There is no change from the guideline published in 2000.** |
| *Urokinase plasminogen activator (uPA) and plasminogen activator inhibitor 1 (PAI-1) as a marker for breast cancer (Note: This topic is new to the guideline)* | uPA/PAI-1 measured by enzyme-linked immunosorbent assays (ELISAs) on a minimum of 300 mg of fresh or frozen breast cancer tissue may be used for the determination of prognosis in patients with newly diagnosed, node negative breast cancer. Immunohistochemistry (IHC) for these markers is not accurate, and the prognostic value of ELISA using smaller tissue specimens has not been validated. Low levels of both markers are associated with a sufficiently low risk of recurrence, especially in hormone receptor–positive women who will receive adjuvant endocrine therapy, that chemotherapy will only contribute minimal additional benefit. Furthermore, cyclophosphamide, methotrexate, and fluorouracil (CMF)-based adjuvant chemotherapy provides substantial benefit, compared with observation alone, in patients with high risk of recurrence as determined by high levels of uPA and PAI-1. |
| *Cathepsin D as a marker for breast cancer* | Present data are insufficient to recommend use of cathepsin D measurements for management of patients with breast cancer. **There is no change from the guideline published in 2000.** |

| Summary of Recommendations for the Use of Tumor Markers in Breast Cancer | |
|---|---|
| **Specific Marker** | **2007 Recommendation** |
| *Cyclin E fragments as markers for breast cancer (Note: This topic is new to the guideline)* | Present data are insufficient to recommend use of whole length or fragment measurements of cyclin E for management of patients with breast cancer. |
| *Proteomic analysis for breast cancer (Note: This topic is new to the guideline)* | Present data are insufficient to recommend use of proteomic patterns for management of patients with breast cancer. |
| *Multiparameter gene expression analysis for breast cancer (Note: This topic is new to the guideline)* | In newly diagnosed patients with node-negative, estrogen-receptor positive breast cancer, the Onco*type* DX assay can be used to predict the risk of recurrence in patients treated with tamoxifen. Onco*type* DX may be used to identify patients who are predicted to obtain the most therapeutic benefit from adjuvant tamoxifen and may not require adjuvant chemotherapy. In addition, patients with high recurrence scores appear to achieve relatively more benefit from adjuvant chemotherapy (specifically [C]MF) than from tamoxifen. There are insufficient data at present to comment on whether these conclusions generalize to hormonal therapies other than tamoxifen, or whether this assay applies to other chemotherapy regimens. The precise clinical utility and appropriate application for other multiparameter assays, such as the MammaPrint assay, the "Rotterdam Signature," and the Breast Cancer Gene Expression Ratio are under investigation. |
| *Bone marrow micrometastases as markers for breast cancer (Note: This topic is new to the guideline)* | Present data are insufficient to recommend assessment of bone marrow micrometastases for management of patients with breast cancer. |
| *Circulating tumor cell assays as markers for breast cancer (Note: This topic is new to the guideline)* | The measurement of circulating tumor cells (CTCs) should not be used to make the diagnosis of breast cancer or to influence any treatment decisions in patients with breast cancer. Similarly, the use of the recently U.S. Food and Drug Administration (FDA)-cleared |

| Summary of Recommendations for the Use of Tumor Markers in Breast Cancer | |
|---|---|
| **Specific Marker** | **2007 Recommendation** |
| | test for CTC (CellSearch Assay) in patients with metastatic breast cancer cannot be recommended until further validation confirms the clinical value of this test. |

### CLINICAL ALGORITHM(S)

None provided

## EVIDENCE SUPPORTING THE RECOMMENDATIONS

### TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The Update Committee attempted, wherever possible, to base the updated recommendations on studies deemed to be Level of Evidence II (prospective therapeutic trials in which marker utility is a secondary study objective), or, ideally, Level of Evidence I (single, high-powered, prospective, randomized controlled trials specifically designed to test the utility of the marker or meta-analyses of well-designed studies).

## BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

### POTENTIAL BENEFITS

Improvements in the prevention, screening, treatment, and surveillance of breast cancers

### POTENTIAL HARMS

Harms considered were inappropriate disease management, and excess cost without definable benefit.

## QUALIFYING STATEMENTS

### QUALIFYING STATEMENTS

- It is important to emphasize that guidelines and technology assessments cannot always account for individual variation among patients. They are not intended to supplant physician judgment with respect to particular patients or special clinical situations and cannot be considered inclusive of all proper methods of care or exclusive of other treatments reasonably directed at obtaining the same result. Accordingly, the American Society of Clinical

Oncology considers adherence to these guidelines to be voluntary, with the ultimate determination regarding their application to be made by the physician in light of each patient's individual circumstances. In addition, this guideline describes the use of procedures and therapies in clinical practice; it cannot be assumed to apply to the use of these interventions performed in the context of clinical trials, given that clinical studies are designed to evaluate or validate innovative approaches in a disease for which improved staging and treatment is needed.

- The Update Committee's literature review focused attention on available systematic reviews and meta-analyses of published tumor marker studies, although primary data were also reviewed. By and large, however, the primary literature is characterized by studies that included small patient numbers, that are retrospective, and that commonly perform multiple analyses until one reveals a statistically significant result. Furthermore, many tumor marker studies fail to include descriptions of how patients were treated or analyses of the marker in different treatment subgroups. The Update Committee hopes that adherence to a recently published set of suggested guidelines for reporting of tumor marker results (designated the Reporting Recommendations for Tumor Marker Prognostic Studies [REMARK] criteria) will provide more informative data sets in the future.

## IMPLEMENTATION OF THE GUIDELINE

### DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

### IMPLEMENTATION TOOLS

Patient Resources
Personal Digital Assistant (PDA) Downloads
Quick Reference Guides/Physician Guides
Slide Presentation

For information about availability, see the "Availability of Companion Documents" and "Patient Resources" fields below.

## INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

### IOM CARE NEED

Living with Illness
Staying Healthy

### IOM DOMAIN

Effectiveness
Patient-centeredness

## IDENTIFYING INFORMATION AND AVAILABILITY

### BIBLIOGRAPHIC SOURCE(S)

Harris L, Fritsche H, Mennel R, Norton L, Ravdin P, Taube S, Somerfield MR, Hayes DF, Bast RC Jr, American Society of Clinical Oncology. American Society of Clinical Oncology 2007 update of recommendations for the use of tumor markers in breast cancer. J Clin Oncol 2007 Nov 20;25(33):5287-312. [321 references] PubMed

### ADAPTATION

Not applicable: The guideline was not adapted from another source.

### DATE RELEASED

1997 (revised 2007 Oct)

### GUIDELINE DEVELOPER(S)

American Society of Clinical Oncology - Medical Specialty Society

### SOURCE(S) OF FUNDING

American Society of Clinical Oncology (ASCO)

### GUIDELINE COMMITTEE

American Society of Clinical Oncology (ASCO) Tumor Markers Expert Panel

### COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

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Center; Pam McAllister, PhD, Science Advocate with the Colorectal Cancer Coalition, Patient Representative; Robert G. Mennel, MD, Texas Oncology PA; Larry Norton, MD, Memorial Sloan-Kettering Cancer Center; Peter Ravdin, MD, M.D. Anderson Cancer Center; Sheila Taube, PhD, National Cancer Institute

## FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

**Note**: Although all authors completed the disclosure declaration, the following author(s) indicated a financial or other interest that is relevant to the subject matter under consideration in this article. Certain relationships marked with a "U" are those for which no compensation was received; those relationships marked with a "C" were compensated. For a detailed description of the disclosure categories, or for more information about the American Society of Clinical Oncology's (ASCO's) conflict of interest policy, please refer to the Author Disclosure Declaration and the Disclosures of Potential Conflicts of Interest section in Information for Contributors in the original journal of publication.

**Employment or Leadership Position**: Peter Ravdin, Adjuvant Inc (C)

**Consultant or Advisory Role**: Lyndsay Harris, LabCorp (C); Herbert Fritsche, Veridex (C), Tosoh (C), Fujirebio Diagnostics Inc (C); Peter Ravdin, Genomic Health (C); Daniel F. Hayes, Abraxis (C), American Biosciences (C), AvariaDx (C), Cytogen Corp (C), Monogram Bioscience (C), Pfizer (C), Precision Therapeutics Inc (C), Rudential Financial (C), QuatRx Pharm (C), Siemens Medical Solutions Diagnostics (C), StemCapture (C); Robert C. Bast Jr, Ciphengen (C), Fujirebio Diagnostics Inc (U), Tanox (C)

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**Honoraria**: Lyndsay Harris, Genentech, Pfizer, Abraxis

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**Expert Testimony**: None

**Other Remuneration**: None

## GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: Bast RC, Ravdin P, Hayes DF, Bates S, Fritsche H, Jessup JM, Kemeny N, Locker GY, Mennel RG, Somerfield MR. 2000 update of recommendations for the use of tumor markers in breast and colorectal cancer: clinical practice guidelines of the American Society of Clinical Oncology. J Clin Oncol 2001 Mar 15;19(6):1865-78.

ASCO guidelines are updated annually by a Review Committee of the full Guidelines Expert Panel, and every 3 years by the full Panel.

## GUIDELINE AVAILABILITY

Electronic copies: Available from the American Society of Clinical Oncology (ASCO) Web site.

Print copies: Available from American Society of Clinical Oncology, Health Services Research, 1900 Duke Street, Suite 200, Alexandria, VA 22314.

## AVAILABILITY OF COMPANION DOCUMENTS

The following are available:

- 2007 update of breast cancer tumor markers clinical practice guideline: recommended tumor markers table. 2007. 3 p. Electronic copies: Available in Portable Document Format (PDF) from the American Society of Clinical Oncology (ASCO) Web site.
- ASCO 2007 update table of recommendations for the use of tumor markers in breast cancer. 2007. 4 p. Electronic copies: Available in Portable Document Format (PDF) from the American Society of Clinical Oncology (ASCO) Web site.
- Breast cancer tumor markers matrix. 2007. 1 p. Electronic copies: Available in Portable Document Format (PDF) from the American Society of Clinical Oncology (ASCO) Web site.
- 2007 update of ASCO recommendations for the use of tumor markers in breast cancer. Slide set. 2007. 20 p. Electronic copies: Available in Portable Document Format (PDF) and PowerPoint from the American Society of Clinical Oncology (ASCO) Web site.
- 2007 update of ASCO recommendations for the use of tumor markers in breast cancer. Guideline summary. 2007. 3 p. Electronic copies: Available in Portable Document Format (PDF) from the American Society of Clinical Oncology (ASCO) Web site.

Guidelines are available for Personal Digital Assistant (PDA) download from the ASCO Web site.

## PATIENT RESOURCES

The following is available:

- ASCO patient guide: tumor markers for breast cancer. 2007 Oct. 4 p.

Available from the Cancer.Net Web site.

Please note: This patient information is intended to provide health professionals with information to share with their patients to help them better understand their health and their diagnosed disorders. By providing access to this patient information, it is not the intention of NGC to provide specific medical advice for particular patients. Rather we urge patients and their representatives to review this material and then to consult with a licensed health professional for evaluation of treatment options suitable for them as well as for diagnosis and answers to their personal medical questions. This patient information

has been derived and prepared from a guideline for health care professionals included on NGC by the authors or publishers of that original guideline. The patient information is not reviewed by NGC to establish whether or not it accurately reflects the original guideline's content.

## NGC STATUS

This summary was completed by ECRI on May 25, 2001. It was verified by the guideline developer as of September 7, 2001. This NGC summary was updated by ECRI Institute on February 18, 2008. The updated information was verified by the guideline developer on February 20, 2008.

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