

## Supplementary material

### Appendix 1: Table of EUSOMA 2017 quality of care indicators.<sup>8</sup>

Quality indicators	Minimum standard value	Ideal value	Justification	Type of indicator according to eusoma
<b>Indicators related to clinical and imaging diagnosis</b>				
Proportion of patients undergoing preoperative mammography and breast and axillary ultrasound	≥ 90%	≥ 95%	Obtain a correct diagnostic approximation regarding tumor size, multifocality, and bilateral pathology. Includes separately reported axillary ultrasound.	Required
<b>Indicators related to preoperative diagnosis</b>				
Proportion of patients with invasive carcinoma staging (ultrasound +/- biopsy as appropriate).	≥ 85%	≥ 95%	Identifying axillary lymph node metastases reduces the need for second surgeries and identifies candidates for systemic treatment (neoadjuvant chemotherapy).	Recommended
Proportion of patients with carcinoma with pre-surgical histological/cytological diagnosis	≥ 85%	≥ 90%	A preoperative diagnosis improves therapeutic approach planning.	Required
<b>Indicators related to anatomopathological characterization for prognostic/predictive purposes</b>				
Proportion of patients with complete records of prognostic/predictive factors in invasive carcinoma <sup>1</sup>	≥ 95%	≥ 98%	A complete description of prognostic and predictive factors improves indications for neoadjuvant and/or adjuvant therapy.	Required
Proportion of patients with records of prognostic factors in carcinoma in situ <sup>2</sup>	≥ 95%	≥ 98%	Recording these factors helps to identify recurrence and facilitate treatment planning.	Required
<b>Indicators related to waiting time</b>				
Proportion of patients with a time interval at the start of treatment equal to 6 weeks from the first diagnosis	≥ 80%	≥ 90%	A short waiting time reduces anxiety for the patient and their family. At the same time, waiting times of more than three months can have a negative impact on the patient's prognosis.	Recommended
<b>Indicators related to the availability of nuclear magnetic resonance (NMR)</b>				
Proportion of cases examined with MRI prior to surgery (excludes patients who underwent neoadjuvant therapy)	Suggested 10%	Not applicable	MRI has greater diagnostic specificity for determining the extent of the disease and multifocal or multicentric pathology. However, excessive use without a specific indication leads to false positives and, consequently, unnecessary interventions. For this reason, EUSOMA recommends its use only in patients with a specific indication.	Recommended

Proportion of patients undergoing neoadjuvant therapy who underwent MRI	Suggested 60%	90%	In patients undergoing neoadjuvant chemotherapy, MRI is indicated for monitoring response to treatment.	Recommended
<b>Indicators related to pre- and/or post-surgical multidisciplinary evaluation</b>				
Proportion of patients who attend multidisciplinary pre- and/or post-surgical conferences:	90%	99%	This approach allows for more appropriate treatment selection, identification of patients who require non-standard treatments, selection of patients for clinical trials, and documentation of the treatments indicated.	Required
<b>Indicators related to locoregional surgical treatment</b>				
Proportion of patients with invasive carcinoma who underwent a single breast surgery for the primary tumor (excluding reconstruction surgery)	80%	90%	This indicator reflects a correct preoperative evaluation and correct surgical and anatomopathological management. A single intervention improves cosmetic results and reduces the risks associated with reoperations. The absence of tumor in the India ink is considered an acceptable margin, i.e., the tumor does not reach the edge of the resected surgical specimen.	Required
Proportion of patients with carcinoma in situ who underwent a single surgery (excluding reconstruction surgery)	70%	90%	Same as above. A margin greater than 2 mm is considered acceptable for patients who will receive radiotherapy.	Required
Proportion of patients who underwent immediate breast reconstruction after mastectomy	40%	Not applicable	It is recommended to discuss breast reconstruction options at the time of indicating mastectomy. This indicator partly reflects patient demand for reconstruction procedures, but it is also related to economic or structural barriers that limit access to the procedure.	Recommended
<b>Indicators related to adjuvant radiotherapy treatment</b>				
Proportion of patients with invasive carcinoma who received breast radiotherapy after breast-conserving surgery	90%	95%	Adjuvant radiotherapy reduces the risk of recurrence and improves survival in patients with invasive breast cancer. The survival benefit is debated in patients over 70 years of age, with a slight benefit remaining in local disease control.	Required
Proportion of patients who received post-mastectomy radiotherapy (when indicated)	90%	95%	Postmastectomy radiotherapy in selected patients (axilla with more than three lymph nodes involved, or tumors larger than 5 cm) reduces recurrence and improves survival.	Required
<b>Indicators related to reduction in overtreatment</b>				
Proportion of patients with negative axilla who underwent sentinel lymph node biopsy (excluding patients undergoing neoadjuvant therapy)	90%	95%	Sentinel lymph node biopsy is an effective and safe method for axillary staging in patients with clinically negative axillae, reducing the performance of unnecessary lymphadenectomies and their complications.	Required

Proportion of patients with invasive carcinoma who underwent sentinel lymph node biopsy and had fewer than five nodes resected	90%	95%	Resection of more than 5 axillary lymph nodes increases morbidity. In most studies, the average number of nodes resected during the sentinel lymph node biopsy procedure is 2 nodes, with false negative results of less than 10%. The removal of a greater number of macroscopically normal nodes in primary surgery does not statistically significantly reduce the false negative rate to justify its performance.	Recommended
Proportion of patients with invasive carcinoma smaller than or equal to 3 cm who underwent conservative surgery (excluding patients with BRCA mutation)	70%	85%	This value is related to proper preoperative evaluation, but also to the availability of adjuvant radiotherapy. For the treatment of early breast cancer, oncological outcomes in terms of survival are similar when comparing breast-conserving surgery and adjuvant radiotherapy versus mastectomy. A conservative approach achieves better cosmetic results with lower morbidity and lower costs (shorter hospital stays, reoperations, reconstruction). Surgery is the treatment of choice for carcinoma in situ. Performing conservative surgery allows the patient to preserve the breast and reduces the morbidity and costs associated with mastectomy and/or reconstructive procedures.	Required
Proportion of patients with carcinoma in situ smaller than or equal to 2 cm who underwent conservative surgery	70%	90%	Surgery is the treatment of choice for carcinoma in situ. Performing conservative surgery allows the patient to preserve the breast and reduces the morbidity and costs associated with mastectomy and/or reconstructive procedures.	Required
Proportion of patients with carcinoma in situ who did not undergo axillary surgery:	97%	99%	The objective of this indicator is to avoid unnecessary axillary surgery. The degree of axillary involvement in carcinomas in situ is 1-2%.	Required
<b>Indicators related to systemic treatment</b>				
Proportion of patients with hormone-sensitive tumors (invasive carcinoma) who received endocrine therapy	85%	95%	All patients with hormone-dependent tumors should receive adjuvant hormone therapy, as it improves oncological outcomes by reducing recurrence and mortality.	Required
Proportion of patients with tumors without hormone receptor expression, $\geq 1$ cm, and/or with axillary involvement who received adjuvant chemotherapy:	85%	95%	Adjuvant chemotherapy treatment for patients with non-hormone-dependent tumors larger than 1 cm or with axillary involvement improves overall survival and reduces recurrences.	Required
Proportion of patients with invasive tumors expressing the Her2neu + receptor, $\geq 1$ cm and/or axillary positive who received adjuvant chemotherapy and trastuzumab	85%	95%	Adjuvant treatment with trastuzumab reduces recurrences and mortality associated with breast cancer. It is indicated in patients whose tumors express the Her2neu receptor, as measured by immunohistochemistry or in situ hybridization (FISH) techniques.	Required
Proportion of patients with Her2neu + invasive tumors treated with NCT	90%	95%	The standard treatment regimen for Her2neu-positive patients undergoing neoadjuvant therapy includes chemotherapy and	Required

(neoadjuvant chemotherapy) who received trastuzumab in neoadjuvant therapy			trastuzumab, as the addition of the latter increases complete pathological response rates in these patients.	
Proportion of patients with inflammatory or locally advanced inoperable carcinoma at baseline who received neoadjuvant therapy	90%	≥ 95%	Neoadjuvant treatment in these patients is important because of the need to reduce tumor size, making an unresectable tumor resectable.	Required
<b>Indicators related to monitoring</b>				
Proportion of patients undergoing routine follow-up every 6–12 months post-treatment:	95%	99%	Regular monitoring allows for early detection of recurrences and their proper management.	Required

- 
1. This indicator includes the complete report of the following prognostic and/or predictive factors: histological type, tumor grade, estrogen receptor (ER) expression, progesterone receptor (PR) expression (optional), Her2neu protein expression, ki67 (optional). In patients undergoing neoadjuvant treatment, this characterization must be performed on the biopsy specimen. In patients undergoing primary surgery, the characterization can be done only on the surgical specimen. In addition, the report should include: tumor size in mm, number of compromised and total lymph nodes, lymphovascular invasion, and distances to the nearest margin.
  2. The report should include histological grade, dominant histological type, size in millimeters, distance to the nearest margin, and estrogen receptor (ER) expression.