Supplementary

Table S1 Evidence quality in CSCO clinical practice guidelines

Type	Evidence characteristics		CSCO expert consensus degree
	Level	Source	
1A	High	Rigorous meta-analysis, large-scale randomized controlled trials	Unanimous consensus (supporting opinions ≥80%)
1B	High	Rigorous meta-analysis, large-scale randomized controlled trials	Basic consensus (supporting opinions 60% to <80%)
2A	Somewhat Low	Moderate quality meta-analysis, small-scale randomized controlled trials, well-designed large retrospective studies, case-control studies	Unanimous consensus (supporting opinions ≥80%)
2B	Somewhat Low	Moderate quality meta-analysis, small-scale randomized controlled trials, well-designed large retrospective studies, case-control studies	Basic consensus (supporting opinions 60% to <80%)
3	Low	Non-comparative single-arm clinical studies, case reports, expert opinions	No consensus, significant controversy (supporting opinions <60%)

Table S2 Recommendation grades in CSCO clinical practice guidelines

Recommendation grade	Definition
Grade I Recommendation	**Class 1A evidence and some Class 2A evidence** The CSCO guidelines classify Grade 1A evidence, as well as some Grade 2A evidence with high expert consensus and good accessibility in China, as Grade I recommendations. Specifically, these are interventions with clear indications, good accessibility, stable tumor treatment value, and inclusion in the "National Basic Medical Insurance, Work Injury Insurance, and Maternity Insurance Drug List" for diagnosis and treatment measures.
Grade II Recommendation	**Class 1B evidence and some Class 2A evidence** The CSCO guidelines classify Grade 1B evidence, as well as some Grade 2A evidence with high expert consensus but poor accessibility in China, as Grade II recommendations. Specifically, these are interventions supported by domestic and foreign randomized controlled trials, providing high-level evidence, but with poor accessibility or relatively low cost-effectiveness. For measures with significant clinical benefits but high cost, considering potential patient benefits, they may also be classified as Grade II recommendations.
Grade III Recommendation	**Class 2B evidence and Class 3 evidence** For certain clinical interventions that are commonly used or have exploratory value, although the evidence from evidence-based medicine is relatively lacking, if the expert group considers them acceptable, they may be classified as Grade III recommendations.

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Table S3 Expert recommendations

Number	Recommendation content	Evidence grade	Recommendation grade
1	For stage II–III TNBC patients eligible for neoadjuvant chemotherapy, it can be considered for a combined immunochemotherapy regimen in the neoadjuvant treatment phase. It is recommended to do imaging-based efficacy evaluations every 2 cycles during the course of treatment. For patients who have good response (including complete or partial remission or stable disease (SD) without significant enlargement) to neoadjuvant therapy, it is recommended to full complete the proposed treatment course, while for those with disease progression should modify the therapeutic regimen timely	1A	Grade 1
2	It is recommended that immunotherapy be considered for patients with early-stage triple-negative breast cancer (eTNBC) who are operable and in II–III stages; Based on KEYNOTE-522 study, patients with low tumor burden (cT2N0) can also be considered to receive combined immunotherapy	1A	Grade 1
3	Based on KEYNOTE-522 study, when considering immunotherapy in the combination with chemotherapy, it is recommended to employ a chemotherapy regimen that begins with combination of taxanes and platinum agents followed by anthracyclines. Taxane and platinum drugs combination can also be considered as an optional choice	1B	Grade 2
4	For pCR TNBC patients, if PD-1 inhibitor drugs have been used before surgery, it is recommended to continue PD-1 inhibitor drug therapy for one year after surgery	1A	Grade 1
5	For non-pCR TNBC patients, if PD-1 inhibitors have been used before surgery, it can be considered to continue using PD-1 inhibitors for one year after surgery	1A	Grade 1
6	For non-pCR TNBC patients, there is insufficient evidence of postoperative immunotherapy combining with capecitabine or olaparib, but clinical experts believe it can be considered to use based on previous data and clinical experience	2B	Grade 3
7	For PD-L1 positive mTNBC patients (same as mTNBC patients in China), based on current evidence, combination of chemotherapy and immune checkpoint inhibitors can be recommended. Pembrolizumab + chemotherapy (nab-paclitaxel, paclitaxel, or gemcitabine + carboplatin) (CPS ≥10) or Toripalimab +nab-paclitaxel (CPS ≥1) can be considered as the first-line treatment	1A	Grade 1
8	For patients who achieve CR/PR/SD through immune and chemotherapy combination, it is recommended to maintain immunotherapy till disease progresses or intolerable toxicity. Simultaneously, regularly evaluation of the efficacy should be given during the treatment so as to adjusted treatment regimen timely once disease progress occurred	2A	Grade 2
9	For breast cancer patients undergoing ICIs therapy, we recommend proactive irAEs monitoring, patient education focused on prevention, and prompt identification of irAEs based on clinical signs. This underscores the necessity of thorough irAE management training for healthcare teams. The management principles can refer to the “management of immune checkpoint inhibitor-related toxicity” published by the Chinese Society of Clinical Oncology (CSCO)	2A	Grade 1
10	Clinical research shows that eTNBC can benefit regardless of the expression level of PD-L1, and the expression level of PD-L1 in advanced breast cancer is related to the efficacy of PD-1/PD-L1 inhibitor. In clinical practice, the approved indications and testing standards for PD-L1 testing vary by different ICIs Therefore, it is recommended to choose the corresponding PD-L1 antibody clone, testing platforms, and scoring methods based on different anti PD-1/PD-L1 agents	2A	Grade 2
11	It is recommended to prioritize PD-L1 testing in paraffin embedded tissue. Surgical resection specimens and biopsy specimens can both be used for PD-L1 testing	1A	Grade 1
12	Both primary and recurrent/metastatic lesions can be used for PD-L1 testing. It is recommended to prioritize PD-L1 testing in tumor tissue from recurrent /metastatic lesions	2A	Grade 2
13	There is lack of evidence that these biomarkers such as TILs, TMB, and MSI are prognostic or predictive, large-sample studies are needed to validate their clinical utility	2B	Grade 3
14	No strong evidence supports ICI use in HR+/HER2- breast cancer	2A	Grade N/A
15	No clear evidence of ICIs in HER2+ mBC patients were established in efficacy benefits, safety and combination patterns. It is not recommended to routinely use ICIs in HER2+ mBC	2B	Grade N/A

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Table S4 PD-L1 testing

Reagents	Medicine	Population	Tumor cell interpretation criteria	Immune cell interpretation criteria	Clinical trial positivity threshold
Dako 22C3	Pembrolizumab	Locally recurrent unresectable or metastatic triple-negative breast cancer	CPS	CPS	CPS ≥10
Ventana SPP142	Atezolizumab	mTNBC	No assessment is required		IC ≥1%
JS 311	Toripalimab	TNBC with first diagnosis of stage IV or recurrent metastases	CPS		CPS ≥1
Dako 28-8	–	Not for breast cancer	–	–	–
Ventana SP263	–	Not for breast cancer	–	–	–

Immune cell (IC) score

$$\text{PD-L1}(\text{SP42})\,\text{IC} = \frac{\text{The area occupied by any PD-L1-stained tumor} - \text{infiltrating immune cells}}{\text{Tumor area}} \times 100\%$$

Combined positive score (CPS)

$$\text{PD-L1}(22\text{C3})\,\text{CPS} = \frac{\text{Number of PD-L1 stained cells}\,(\text{tumor cells, lymphocytes, macrophages})}{\text{Total number of viable tumor cells}} \times 100$$

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