ESMO EXAMINATION – Answers to trial questions

Type A – Single choice
The correct answers are marked in **bold**

A1

In which case does the molecular aberration occur with a frequency of 80%?

A) BRAF mutation in hairy cell leukaemia

B) EGFR mutation in non-small-cell lung cancer (western population)

C) HER2 overexpression in gastric cancer

D) MGMT gene methylation in glioblastoma

E) NRAS mutation in colorectal cancer

A2

A 74-year-old woman presented with pain at the right side of her abdomen due to hepatomegaly. Further investigations revealed multiple liver metastases of a poorly differentiated adenocarcinoma, no primary tumour detected by PET scan. Her WHO performance status is 3.
Which is the most appropriate approach?

A) Offer best supportive care

B) Order gene expression profiling of tumour tissue to select targeted therapy

C) Referral for phase I trial

D) Referral for transarterial chemo-embolization (TACE)

E) Start treatment with cisplatin/gemcitabine

A3

Which of the following cancer drugs is an antimetabolite?

A) Bleomycin

B) Cisplatin

C) Gemcitabine

D) Paclitaxel

E) Trastuzumab

A4

Which recommendation do you give to patients after successful treatment of early breast cancer?

A) Annual chest X-ray and liver sonography

B) Physical exercise

C) Annual bone density evaluation

D) Annual determination of tumour markers

E) Annual MRI control of the breasts

A5

A 30-year-old man presents with increasing weakness of the right arm for the last 4 weeks. An MRI of the brain shows a 2 cm contrast enhancing mass on the left parietal lobe with oedema. A surgical biopsy reveals a glioblastoma. His ECOG performance status is 1 and he has no comorbidities.
What is **NOT** part of management?

A) Anti-epileptic prophylaxis

B) Complete tumour resection

C) Radiotherapy

D) Steroids

E) Temozolomide

A6

A 25-year-old male patient is diagnosed with a melanoma. Resection shows a pT2a pN0(sn) M0 R0 tumour with Breslow 1.2 mm and a BRAF V600E mutation.
Which is the correct management?

A) Adjuvant dabrafenib and trametinib

B) Adjuvant nivolumab

C) Adjuvant nivolumab and ipilimumab

D) Adjuvant interferon alpha 2b

E) Follow-up

A7

A 68-year-old patient is diagnosed with squamous cell cancer of the lung cT3 cN2 M1 (liver, adrenal gland and pleura). He is disoriented and aggressive. An MRI of the brain shows no metastases. Earlier, he showed an adequate behaviour, he does not take any medication.

What is the most likely explanation for his symptoms?

A) Addison crisis

B) Diabetes insipidus

C) Diabetes mellitus

D) Hypercalcaemia

E) Hypernatraemia

A8

You have a new patient with locally advanced NSCLC stage IIIB. Histology is squamous cell cancer. PD-L1 expression is 5%. He has been treated with chemoradiotherapy 60 Gy concurrently with 3 cycles of cisplatin plus vinorelbine. He achieved partial remission as a result. Performance status is 1 ECOG, he is former smoker.

What is the most appropriate approach next?

A) Follow-up

B) Maintenance treatment with pembrolizumab until progression

C) Maintenance treatment with durvalumab for 12 months

D) Maintenance with atezolizumab until progression

E) Maintenance with ipilimumab and nivolumab until progression

A9

A 52-year-old man is newly diagnosed with metastatic colon cancer in the coecum, multiple non-resectable liver, lung and peritoneal metastases. Molecular analyses show a tumour with a KRAS p.G12C mutation, wildtype for NRAS and BRAF, microsatellite-stable (MSS) and HER2 negative.

Which is the most appropriate first-line treatment?

A) FOLFOX and cetuximab

B) FOLFIRI and panitumumab

C) FOLFOXIRI and bevacizumab

D) FOLFOXIRI and cetuximab

E) Panitumumab and sotorasib

A10

A 65-year-old man is diagnosed endoscopically with early-stage gastric cancer and is treated with endoscopic resection. Pathology of the resected specimen shows a 2.5 cm adenocarcinoma with mucosal depth of invasion and active *Helicobacter pylori* infection.

Which of the following interventions has been shown to decrease rates of metachronous gastric cancer and improve baseline stomach atrophy?

A) Proton pump inhibitor

B) Celecoxib

C) *Helicobacter pylori* eradication

D) Repeat endoscopic resection

E) Repeat endoscopic surveillance in 3 months

A11

A 74-year-old man with a history of muscle-invasive urothelial cancer presents for follow-up 1 month after undergoing a radical cystectomy (pT3 pN0). The patient has a creatinine clearance of 45 mL/min. He is well recovered, ECOG PS 1. What is the most appropriate adjuvant treatment?

A) Nivolumab if PD-L1 is positive

B) Cisplatin and gemcitabine followed by avelumab

C) Nivolumab regardless of PD-L1 status

D) Carboplatin and gemcitabine followed by nivolumab

E) MVAC (methotrexate, vinblastine, doxorubicin and cisplatin)

A12

What is the correct association between target and drug?

A) Crizotinib - EGFR

B) Erdafitinib - FGFR

C) Sunitinib - RET

D) Lenvatinib - MET

E) Sotorasib - ALK

A13

A 71-year-old man with several comorbidities (diabetes, polyneuropathy, coronary heart disease) was diagnosed with a large mass in the liver. Biopsy showed adenocarcinoma consistent with a colon primary tumour, which was found in the coecum. Molecular profiling shows a KRAS mutation (G12A) and MSI-h.
Which is the most appropriate treatment for this patient?

A) Capecitabine and bevacizumab

B) Trifluridine and tipiracil

C) Pembrolizumab

D) FOLFIRI and panitumumab

E) mFOLFOX6 and bevacizumab

A14

Which of the following immune-related adverse events occurs least frequently during immunotherapy with checkpoint inhibitors?

A) Rash

B) Arthralgia

C) Thyroiditis

D) Myocarditis

E) Colitis

A15

A 62-year-old man was diagnosed with metastatic gastric cancer (extensive peritoneal carcinomatosis); histology showed an undifferentiated adenocarcinoma with signet cell features, MSS, HER2 negative and a PD-L1 expression (CPS) of 25.

What is the preferred first-line therapy according to the ESMO guidelines?

A) FLOT

B) FOLFOX

C) FOLFOX and trastuzumab

D) FOLFOX and nivolumab

E) FOLFIRI and nivolumab

A16

Which of the following statements is correct regarding a maintenance therapy with 5-FU plus bevacizumab in metastatic colorectal cancer?

A) It improves overall survival

B) It should be continued for up to 2 years in patients who are responding to the treatment prolonging progression-free survival

C) It improves progression-free survival and overall survival

D) Prolongs progression-free survival

E) Maintenance with bevacizumab alone has shown to be of similar efficacy to 5-FU plus bevacizumab

A17

A 72-year-old patient presented with increasing pain in his right arm for the last 6 weeks. An X-ray showed a destructive mass of 7 cm in the distal right humerus. The patient is in a good performance status, has no comorbidities but for chronic reflux disease treated with proton-pump-inhibitors. Clinical examination shows no abnormalities apart from the pain in the right arm. Histopathological examination of the tumour mass reveals diffuses large B-cell lymphoma.

Which is the most appropriate imaging assessment?

A) MRI of the brain

B) Ultrasound of lymph node regions

C) Bone scintigraphy

D) Endoscopic ultrasound of the oesophagus

E) Whole body PET-CT scan

A18

A 55-year-old postmenopausal woman presented with high-risk breast cancer pT3 G3, pN2, cM0, ER 30%, PgR 0%, Ki67 22%, HER2 IHC 1+. She has been treated with breast-conserving therapy, adjuvant anthracycline and taxane-based chemotherapy and adjuvant radiotherapy. A germline BRCA2-mutation was detected.
What is the most appropriate further treatment?

A) Carboplatin for 6 cycles

B) Capecitabine for 6 cycles

C) Fulvestrant and palbociclib

D) Letrozole and olaparib

E) Anastrozole, abemaciclib, olaparib

A19

A 59-year-old patient was newly diagnosed with metastatic prostate cancer with multiple bone lesions (> 6) and enlarged retroperitoneal lymph nodes (up to 4 cm). There are no significant comorbidities except of arterial hypertension.
Which is the best treatment for this patient?

A) ADT (androgen-deprivation therapy), docetaxel upon disease progression

B) ADT and docetaxel

C) ADT and docetaxel and abiraterone/prednisone

D) ADT and abiraterone/prednisone

E) ADT and enzalutamide

A20

A 54-year-old woman was diagnosed with early breast cancer on the right side, 2.5 cm in largest dimension, HER2 positive, ER 90% PgR 80% positive, Ki-67 30%. Initially she underwent neoadjuvant treatment with 4 cycles of doxorubicin plus cyclophosphamide and then 12 weeks of weekly paclitaxel and trastuzumab/pertuzumab every 3 weeks. She underwent breast-conserving surgery. Pathologic complete remission was not achieved. Pathologic report specimen of the breast sample was HER2 negative, ER80% PgR70%, Ki-67 20%.

What is the most appropriate adjuvant treatment in addition to the planned aromatase inhibitor?

A) Trastuzumab

B) Trastuzumab emtansine

C) Lapatinib

D) Capecitabine

E) Trastuzumab deruxtecan

A21

Which of the following statements about adjuvant therapy of biliary tract cancer is correct?

A) Randomised trials have shown a PFS benefit for chemotherapy

B) Chemoradiation is superior to chemotherapy

C) Radiotherapy improves OS for patients with R1 resection

D) 5-FU based chemoradiation is standard of care

E) Benefit of chemotherapy is for patients with gallbladder cancer and not for bile duct cancer

A22

Which pharmacogenomic testing is recommended by EMA and FDA to estimate and avoid toxicity before the treatment start?

A) UGT1A1 before irinotecan

B) CYP2D6 before tamoxifen

C) Topoisomerase IIb before anthracyclines

D) DPYD before fluoropyrimidines

E) MGMT before temozolomide

A23

Regarding antibody-drug conjugates (ADC) for the treatment of metastatic breast cancer, which statement is **FALSE**?

A) Sacituzumab govitecan targets TROP2 and is active regardless of TROP2 expression

B) Trastuzumab deruxtecan targets HER2 and is active in HER2-low and HER2-amplified breast cancer

C) Trastuzumab emtansine has a topoisomerase inhibitor as payload

D) Sacituzumab govitecan has a topoisomerase inhibitor as payload

E) Trastuzumab deruxtecan has a topoisomerase inhibitor as payload

A24

A 51-year-old woman was diagnosed with endometrial cancer, endometroid subtype, Stage II Grade 3. Molecular pathological examination revealed POLEmut (polymerase epsilon-ultramutated).

Which further adjuvant approach after oncologic R0 resection is recommended?

A) No further treatment

B) Vaginal brachytherapy

C) External beam radiotherapy (EBRT)

D) Chemotherapy

E) Concurrent EBRT and chemotherapy

A25

A 55-year-old woman was diagnosed with endometrial cancer, endometroid subtype, stage I with myometrial invasion. Immunohistochemistry revealed alteration of p53 (p53-abn).

Which is the best further adjuvant approach after oncologic R0-resection?

A) No further treatment

B) Chemotherapy

C) External beam radiotherapy (EBRT)

D) Concurrent EBRT and chemotherapy

E) Sequential EBRT and chemotherapy

A26

A 79-year-old woman is diagnosed with an adenocarcinoma of the lung (NCSLC) with pulmonary metastases. PD-L1 TPS 10%. Next generation sequencing (NGS) shows a HER2 (ERBB2) mutation, and no other mutations. She was initially treated with carboplatin, pemetrexed and pembrolizumab followed by a maintenance therapy with pemetrexed and pembrolizumab for 5 months. Follow-up CT scan reveals a progression of the lung and adrenal metastases.

Which of the following therapies has the highest response rate?

A) Docetaxel

B) Pembrolizumab and ramucirumab

C) Osimertinib

D) Alectinib

E) Trastuzumab deruxtecan

A27

A 66-year-old male patient in otherwise good condition presents with cough and dyspnoea. CT scan shows a mediastinal mass with metastases to the left liver lobe and the left adrenal gland.

Histology from the primary tumour reveals small-cell lung cancer.

Which of the following recommendations by the interdisciplinary tumour board is according to the ESMO guidelines?

A) Combination chemotherapy with platinum and etoposide

B) Combination immunotherapy with nivolumab and ipilimumab

C) Combination chemotherapy with platinum and etoposide combined with concomitant radiotherapy of the primary tumour

D) Combination chemotherapy with platinum and etoposide plus durvalumab

E) Monotherapy with atezolizumab

A28

A 67-year-old patient presents with widespread metastatic disease. A biopsy of a metastatic lesion shows an undifferentiated neoplasm. Immunohistochemistry shows pan-keratin (AE1/AE3) negative; CD45 negative and SOX10 and S100 positive.

Which is the most probable diagnosis?

A) Lung carcinoma

B) Melanoma

C) Mesothelioma

D) Breast carcinoma

E) Merkel cell carcinoma

A29

Which of the following is a requirement for a patient with uveal melanoma to be eligible for the treatment with tebentafusp?

A) Positive HLA-A*02:01

B) Prior liver-directed therapy

C) Symptomatic CNS metastases

D) Active systemic immunosuppressive therapy

E) Treatment-naive advanced uveal melanoma

A30

What is the most recommended option for most patients with metastatic GEP NETs (gastro-entero-pancreatic neuroendocrine tumours) grade 1 and progressive disease despite a long-acting somatostatin analog and who have somatostatin receptor-positive disease with no underlying renal or hematologic insufficiency?

A) Radium-223

B) Lutetium-177 DOTATATE

C) Everolimus

D) Streptozocin and 5-FU

E) Interferon alpha

A31

A 61-years-old woman is diagnosed with ER100%, PgR 85%, HER2 negative (IHC 1+) breast cancer with multiple bone, lung and at least 8 liver metastases. Except for intermittent lower back pain, she is asymptomatic and in excellent performance status without comorbidities.

Which of the following is the most appropriate treatment?

A) Trastuzumab deruxtecan

B) 4x dose-dense AC followed by aromatase inhibitor

C) Aromatase inhibitor and GnRH-analogue

D) Aromatase inhibitor and CDK 4/6 inhibitor

E) Capecitabine

A32

A 65-year-old patient was treated 5 months ago with definitive chemoradiotherapy for pharyngeal squamous cell carcinoma stage cT3 cN2 cM0. PD-L1 (CPS) status was 25. Now he presents with extensive ulcerative fixed relapse and cervical lymph node involvement without distant disease.

What is the most appropriate treatment option?

A) Re-irradiation

B) Platinum-based chemotherapy and cetuximab

C) Salvage surgery

D) Pembrolizumab

E) Platinum-based chemotherapy and nivolumab

A33

Which of the following targeted therapies is **NOT** ALK inhibitor?

A) Brigatinib

B) Selpercatinib

C) Ceritinib

D) Alectinib

E) Lorlatinib

A34

A 74-year-old patient presents with a non-resectable cutaneous squamous cell carcinoma on his head (with involvement of the eyelid). ECOG Performance status 1.

Which treatment is most appropriate according to ESMO guidelines?

A) Radiotherapy

B) Cemiplimab

C) Cisplatin and 5-FU

D) Cetuximab

E) Vismodegib

A35

Which type of drug is **NOT** used in first-line treatment of unresectable hepatocellular carcinoma?

A) CTLA4-antibodies

B) PDL1-antibodies

C) VEGF-antibodies

D) mTOR-inhibitors

E) Multikinase inhibitors

A36

Glofitamab is a CD20-targeted T-cell (CD3)–engaging bispecific antibody.

When used as a single agent in patients with refractory B-cell lymphoma, which of the following adverse events is most common?

A) Neurologic adverse events

B) Infections

C) Febrile neutropenia

D) Immune effector cell-associated neurotoxicity syndrome (ICANS)

E) Cytokine release syndrome

A37

What is the most appropriate management for T2N1 (FIGO stage II) squamous cell carcinoma of the cervix?

A) Surgery

B) Radiochemotherapy with cisplatin

C) Radiochemotherapy with cetuximab

D) Radiochemotherapy with cisplatin and pembrolizumab

E) 4 courses of carboplatin and paclitaxel followed by radiotherapy

A38

A 42-year-old patient with a previous history of stage I seminoma under active surveillance was diagnosed with deep venous thrombosis of the right leg. Staging CT is shown below.

What is the preferred treatment option for this patient?

A) Retroperitoneal lymphadenectomy

B) Chemotherapy with 1 cycle of carboplatin AUC7

C) Chemotherapy with 3 cycles of BEP (bleomycin, etoposide, cisplatin)

D) Radiation therapy of the tumour bulk

E) Chemotherapy with 1 cycle of VIP (etoposide, ifosfamide, cisplatin)

A39

A 64-year-old man with ECOG PS 1 with a long-standing history of anal condylomas controlled with imiquimod, presents with anal squamous cell carcinoma, stage III, cT2cN2cM0, p16 and HPV positive.

What is the most appropriate treatment?

A) Chemoradiotherapy with mitomycin and 5-FU

B) Cisplatin and 5-FU

C) Radiotherapy

D) Radiotherapy in combination with cetuximab

E) Abdominoperineal resection

A40

A 53-year-old woman with ECOG PS 0 presents with discrete odynophagia and slow growing bilateral cervical masses. Biopsy shows lymph node metastasis of squamous cell carcinoma, p16 and HPV positive. CT scan shows two mucosal lesions, one in the oropharynx another in the palatine amygdala.

What is the most appropriate conduct?

A) Amygdalectomy and bilateral cervical lymph node dissection

B) Chemoradiotherapy with cisplatin

C) Radiotherapy in combination with cetuximab

D) Radiotherapy

E) Cisplatin and 5-FU

A41

Reference: Fizazi K, Foulon S, Carles J, et al. Abiraterone plus prednisone added to androgen deprivation therapy and docetaxel in de novo metastatic castration-sensitive prostate cancer (PEACE-1): a multicentre, open-label, randomised, phase 3 study with a 2 x 2 factorial design. Lancet; Published online 8 April 2022. DOI: https://doi.org/10.1016/S0140-6736(22)00367-1

A 62-year-old man has been diagnosed with prostate carcinoma featuring widespread bone and lung metastases. He has a good performance status (ECOG 1) with no comorbidities. Subsequent studies reveal microsatellite instability-high (MSI-H) and wild-type (wt) BRCA1/2.

What would be the most suitable initial treatment option besides androgen deprivation therapy (ADT)?

A) Denosumab

B) Pembrolizumab

C) Olaparib

D) Enzalutamide and denosumab

E) Abiraterone and docetaxel

A42

Reference: ESMO guidelines; Loriot et al. NEJM DOI: 10.1056/NEJMoa1817323

A 52-year-old patient with metastatic urothelial carcinoma progressed upon first-line platinum-based therapy. Molecular testing revealed FGFR-3 fusion.
Which treatment improves outcomes in this setting?

A) Regorafenib

B) Erdafitinib

C) Encorafenib

D) Pemigatinib

E) Alectinib

A43

Reference: 1.Chang HP et al. Whole-Body Pharmacokinetics and Physiologically Based Pharmacokinetic Model for Monomethyl Auristatin E (MMAE). J Clin Med. 2021 Mar 23;10(6):1332. doi: 10.3390/jcm10061332. PMID: 33807057; PMCID: PMC8004929.2. Chau CH, et al. Antibody-drug conjugates for cancer. Lancet. 2019 Aug 31;394(10200):793-804. doi: 10.1016/S0140-6736(19)31774-X. PMID: 31478503.

What is the mechanism of action of monomethyl auristatin E (vedotin)?

A) Antimetabolite

B) Multi-target tyrosine kinase inhibitor

C) Topoisomerase I inhibitor

D) Antimitotic agent

E) Monoclonal antibody

A44

Reference: 2023 MASCC and ESMO guideline update for the prevention of chemotherapy- and radiotherapy-induced nausea and vomiting, 11.01.2024

Which is the most effective treatment for breakthrough-induced nausea and vomiting for patients receiving standard prophylaxis for moderately emetogenic antineoplastic chemotherapy?

A) Acupressure

B) Oral metoclopramide daily for 5 days

C) A single dose of palonosetron intravenously

D) Oral dexamethasone daily for 3 days

E) Oral olanzapine daily for 3 days

A45

Reference: ESMO Clinical Practice Guideline for the diagnosis, staging and treatment of patients with metastatic breast cancer, A Gennari et al. 2021

A 53-year-old woman is newly diagnosed with a triple negative metastatic breast cancer, grade 3.
Among the following treatments, which one is **NOT** an option (knowing that the patient has no imminent organ failure)?

A) Atezolizumab plus nab-paclitaxel if PD-L1 CPS ≥ 1%

B) Pembrolizumab plus paclitaxel if PD-L1 CPS ≥ 10

C) Sacituzumab govitecan

D) Taxane monotherapy if PD-L1 CPS is negative

E) Olaparib if there is a germline BRCA mutation

A46

Reference: Prostate cancer: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up C. Parker et al., 2020

Which one of the following strategies is **NOT** an option to manage a patient with localized, low risk prostate cancer?

A) Active surveillance

B) Neoadjuvant androgen-deprivation therapy plus external beam radiotherapy

C) Radical prostatectomy

D) External beam radiotherapy

E) Brachytherapy

A47)

Reference: Araghi et al. Cancer Cell International (2023) 23:162

A7) Associate targeted drugs with their corresponding targets. Indicate which one of them is **NOT** a correct association.

A) Tepotinib and MET

B) Selpercatinib and ROS1

C) Sotorasib and KRASG12C

D) Entrectinib and NTRK

E) Lorlatinib and ALK

A48

What is the most common histologic subtype of malignant mesothelioma?

A) Epithelial

B) Sarcomatoid

C) Biphasic

D) Poorly differentiated

E) Desmoplastic

A49

Reference: Patient and tumour characteristics, management, and age-specific survival in women with breast cancer in the East of England. Ali AM et al. Br J Cancer. 2011 Feb 15;104(4):564-70

The absolute benefit for overall survival of adjuvant treatment of patients 80 years or older with resected breast cancer is lower than of younger patients < 70 years.
What is the main explanation for this phenomenon?

A) Higher treatment toxicity resulting in dose reductions

B) Higher perioperative complication rates delaying adjuvant treatment

C) Higher percentage dying of non-cancer-related causes

D) Tendency to spare older patients from toxic treatments

E) Systemic treatment is less effective in older patients

A50

Reference: https://www.esmo.org/guidelines/esmo-expert-consensus-statements/esmo-expert-consensus-statements-on-the-management-of-breast-cancer-during-pregnancy-prbc

A 32-year-old pregnant (14 weeks) woman was diagnosed with left-sided breast cancer. Clinically 3 cm, no palpable axillary lymph nodes, free supraclavicular region. Biopsy revealed invasive ductal carcinoma, grade 3, Ki67 70%, endocrine dependent (ER 100%, PR 70%), HER2 positive (IHC 3+). Laboratory workup: no major abnormalities, chest X-ray and liver sonography: no evidence of metastatic spread.
What would be the most appropriate strategy?

A) Anthracycline and taxane-based chemotherapy

B) Mastectomy and sentinel lymph node biopsy SLNB and post-operative radiotherapy

C) Anti-HER2 therapy

D) Endocrine therapy

E) Anti-PD1 therapy

A51

Reference: https://www.annalsofoncology.org/article/S0923-7534(20)39949-X/fulltext

A 51-year-old man is diagnosed with squamous cell carcinoma at the base of the tongue. Staging shows T2N2, ECOG PS 1 and normal renal function.
What would be the recommended treatment?

A) Radiotherapy (RT) plus cisplatin 100 mg/m^2 3 weekly

B) RT plus cisplatin 70 mg/$m^2$3 weekly

C) RT plus pembrolizumab

D) RT plus cetuximab

E) RT plus cisplatin 70 mg/$m^2$3 weekly plus pembrolizumab

A52

Reference: Cancer cachexia in adult patients: ESMO Clinical Practice Guidelines, April 2021

Cachexia is a relevant problem in advanced cancer.
Which measure is recommended, if probability of survival is less than 3 months?

A) Parenteral nutrition

B) Enteral nutrition

C) Vigorous physical activity

D) Comfort-directed care

E) Megestrol acetate

A53

Reference: Cancer of unknown primary: ESMO Clinical Practice Guideline for diagnosis, treatment and follow-up☆ A. Krämer, T. Bochtler, C. Pauli, G. Pentheroudakis, K. Fizazi on behalf of the ESMO Guidelines Committee ∗ Published:December 20, 2022DOI: https://doi.org/10.1016/j.annonc.2022.11.013

According to the ESMO Guidelines, which of the following treatment options is **NOT** recommended in breast-like CUP (Carcinoma of Unknown Primary) with isolated lymph node metastasis to the axilla and negative MRI of the breast?

A) Axillary lymph node dissection

B) Radiotherapy of the breast

C) Mastectomy

D) Systemic therapy analogous to metastatic disease

E) Adjuvant endocrine therapy if the tumour is ER (estrogen receptor) positive

A54

Reference: Sedgwick P, Joekes K. Kaplan-Meier survival curves: interpretation and communication of risk BMJ 2013; 347: f7118 doi:10.1136/bmj.f7118

What do Kaplan-Meier curves primarily depict in oncology studies?

A) The distribution of patients across different age groups

B) The relationship between two continuous variables

C) The cumulative probability of survival over time

D) The incidence of a specific disease in a population

E) The effect sizes (e.g. hazard ratios, odds ratios, risk ratios) from individual studies

A55

Reference: Pocock, S. J., & Stone, G. W. (2016). The primary outcome fails – what next? New England Journal of Medicine, 375(9), 861-870.

In an oncological trial assessing the efficacy of a new treatment, the researchers decide to perform subgroup analyses.

What should be considered when interpreting subgroup analyses?

A) They ensure consistent treatment effects across diverse patient populations

B) They are designed to circumvent confounding variables and biases

C) They provide more reliable results when based on a small sample size

D) They are primarily conducted to confirm preconceived hypotheses

E) They are susceptible to biases and may lead to spurious findings

A56

Reference: DuMontier C, Loh KP, Soto-Perez-de-Celis E, Dale W. Decision Making in Older Adults With Cancer. J Clin Oncol. 2021 Jul 1;39(19):2164-2174. doi: 10.1200/JCO.21.00165. Epub 2021 May 27. PMID: 34043434; PMCID: PMC8260915.

When managing cancer in older adults, which of the following is a crucial principle in treatment decision-making?

A) Prioritizing aggressive and intensive treatment strategies

B) Focusing on the patient's chronological age

C) Prioritizing treatment intensity over the patient's overall health and preferences

D) Recommending surgery as the first-line treatment for all types of cancer

E) Considering the patient's overall health, functional status, and goals of care

A57

Reference: The Number Needed to Treat (NNT) is the number of patients you need to treat to prevent one additional bad outcome. To calculate the NNT, you need to know the Absolute Risk Reduction (ARR); the NNT is the inverse of the ARR: NNT = 1/ARR Ref> Elliott, M.H. JAMA Intern med. 2021

In a clinical trial investigating a new treatment, the 5-year survival was 80% in the experimental arm and 70% in the control arm.

What is the number needed to treat (NNT)?

A) 10

B) 20

C) 30

D) 70

E) 80

A58

Reference: Thymic epithelial tumours: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up. Ann Oncol. 2015 Sep;26 Suppl 5: v40-55. doi: 10.1093/annonc/mdv277. PMID: 26314779

A 37-year-old woman is diagnosed with a thymoma and curatively resected. Pathology shows: Thymoma, 10% type B1, 90% type B2, stage pT3 no lymphovascular invasion Pn0 R0, Masaoka-Koga stage III.

What post-operative treatment do you recommend according to the ESMO Guidelines?

A) No adjuvant treatment

B) Adjuvant radiotherapy

C) Adjuvant chemotherapy with CAP (cisplatin, doxorubicin, cyclophosphamide)

D) Adjuvant chemoradiation with carboplatin and paclitaxel

E) Adjuvant immunotherapy with nivolumab

A59

Reference: Cite Share Adjuvant Nivolumab in Resected Esophageal or Gastroesophageal Junction Cancer. N Engl J Med. 2021 Apr 1;384(13):1191-1203. doi: 10.1056/NEJMoa2032125. PMID: 33789008

A 72-year-old woman was operated on her squamous cell cancer of the middle oesophagus (staged cT3 cN1 cM0) after neoadjuvant chemoradiation analogous to the CROSS regimen pathological examination shows a ypT3 ypN0 (0/21) no lymphovascular invasion Pn1 R0, regression grade 3 (Mandard).
Which adjuvant treatment do you recommend according to the ESMO Guidelines?

A) FLOT (5-FU, leucovorin, oxaliplatin, docetaxel) x 4 cycles

B) Carboplatin and paclitaxel weekly for 6 weeks

C) Pembrolizumab for 1 year

D) Nivolumab for 1 year

E) Ipilimumab and nivolumab for 1 year

A60

Reference: PubMed Follow-up with CA125 after primary therapy of advanced ovarian cancer has major implications for treatment outcome and trial performances and should not be routinely performed. Rustin GJ Ann Oncol. 2011 Dec;22 Suppl 8: viii45-viii48.

A 55-year-old woman was diagnosed with stage III high-grade serous ovarian cancer and underwent primary resection followed by standard chemotherapy. She is asymptomatic but during the follow-up period has an increasing tumour marker CA125. PET-CT imaging does not identify recurrent disease.

Which of the following is the best treatment approach?

A) Platinum-based chemotherapy

B) Single-agent liposomal doxorubicine

C) Single-agent docetaxel

D) Trabectedin

E) Observation

A61

Sacituzumab-govitecan and trastuzumab-deruxtecan are new antibody-drug conjugates used for treatment of breast cancer. They share some similarities.
Which statement is correct?

A) They target both HER2 and TROP2

B) The drug-antibody ratio is similar

C) The linker is similar

D) The mechanism of action of the payload is similar (topoisomerase 1 inhibitor)

E) The frequency of administration is similar (every 21 days)

A62

A 62-year-old patient with metastatic colon cancer is scheduled for the second cycle of FOLFIRI-panitumumab. She reports that immediately after the last chemo administration she suffered acute abdominal cramps followed by 4 massive, watery bowel movements on her way home. She felt weak and light-headed for the rest of the day. Today, 14 days later, her lab tests show normal hepatic and renal function, a neutrophil count of 4.3 g/L (nadir at day 7: 0.6 g/L), haemoglobin of 134 g/L and thrombocyte count of 125 g/L (day 7: 105 g/L).

What is the most appropriate management for the second administration of FOLFIRI-panitumumab?

A) Premedication with atropine

B) Administration of G-CSF, days 5-7

C) Omit 5-FU bolus

D) Withhold panitumumab

E) Premedication with methylprednisolone

A63

A 58-year-old, former alcoholic, presents with a large hepatic mass with portal vein infiltration and several bone metastases. Biopsy confirms the diagnosis of hepatocellular carcinoma. Liver function is Child-Pugh A.
Which is the preferred treatment option according to the ESMO Guidelines?

A) Sorafenib

B) Transarterial chemoembolization

C) Stereotactic body radiotherapy (SBRT)

D) Atezolizumab and bevacizumab

E) Regorafenib and nivolumab

A64

Which statement concerning sacituzumab govitecan is **NOT** correct?

A) It is indicated for the treatment of triple negative breast cancer

B) It is a monoclonal anti-Trop-2 antibody conjugated with the topoisomerase inhibitor SN-38

C) It leads to antibody-dependent cellular cytotoxicity

D) Its major toxicity is reversible congestive heart failure

E) UGT1A1 polymorphism has an impact on its activity

A65

Reference: Trastuzumab Deruxtecan in Previously Treated HER2-Positive Gastric Cancer. N Engl J Med 2020; 382:2419-2430

A 68-year-old woman with a good performance status and no relevant comorbidities was diagnosed with a HER2 positive, PD-L1 CPS < 1%, metastatic gastric adenocarcinoma with liver and peritoneal metastasis. She received cisplatin and 5-FU with trastuzumab as first-line therapy, with stable disease after 3 months. A CT scan after 5 months demonstrated progression of disease with increased size of liver metastasis. A second-line therapy with paclitaxel and ramucirumab was initiated. After 3 months a CT scan reveals progression with new lung metastasis. The patient is still in good performance status and is motivated to receive further therapy.

A new biopsy shows HER2-ISH amplification, which of the following would be the most appropriate treatment?

A) Trastuzumab deruxtecan

B) Pembrolizumab

C) Trastuzumab, pertuzumab and docetaxel

D) Trastuzumab and paclitaxel

E) Best supportive care

A66

Reference: Sekulic K et al. Efficacy and safety of vismodegib in advanced basal-cell carcinoma. NEJM 2012

Which of the following therapies would you recommend for an 80-year-old fit male patient with inoperable periorbital basal cell carcinoma?

A) Nivolumab

B) Platinum-based chemotherapy

C) Sunitinib

D) Vemurafenib

E) Vismodegib

A67

After several years of abdominal pain, flushing and diarrhoea, a 66-year-old man was diagnosed with a neuroendocrine tumour NET G1 (Ki67 1-2%) in the small bowel with multiple liver metastases. The tumour shows high intensity in the Ga-DOTATATE PET and an elevated 5-HIAA (5 hydroxy-indoleacetic acid) in the 24-hour urine.

What is the appropriate first-line treatment?

A) Somatostatin analogue monotherapy

B) Somatostatin analogue and interferon alpha

C) Somatostatin analogue and telotristat etiprate

D) Somatostatin analogue and everolimus

E) Somatostatin analogue and chemotherapy

A68

A 23-year-old patient suffers from a metastatic non-seminoma and is to receive 3 cycles of BEP with a curative intent (Bleomycin, Etoposide, Cisplatin). He tolerates the first cycle without major problems. On day 1 of cycle 2 he isafebrile and has normal vital signs but shows the following haematologic values: Hb 7.8 mmol/L (130 g/L); leukocytes $1.1x10^9$/L, neutrophils $0.3x10^9$/L; platelets $83x10^9$/L.

How do you proceed?

A) Delay cycle 2 until neutrophils rise > $0.5x10^9$/L

B) Delay cycle 2 and then continue with 80% doses of BEP

C) Give G-CSF and start simultaneously with full dose cycle 2

D) Start cycle 2 with full dose BEP as planned

E) Start cycle 2 as planned but with 80% doses of BEP

A69

The response rate of monotherapy with the checkpoint inhibitor nivolumab is the highest in:

A) Breast cancer

B) Hodgkin lymphoma

C) Lung cancer

D) Melanoma

E) NHL

A70

A 70-year-old man presents with an enlarged right inguinal lymph node. No primary tumour is identified. Immunohistochemical analysis of the lymph node reveals the following pattern: cytokeratins-, LCA-, PSA-, vimentin+, HMB45+.
These findings are characteristic for:

A) Germ cell cancer

B) Lymphoma

C) Melanoma

D) Neuroendocrine tumour

E) Urothelial carcinoma

A71

In a 65-year-old male patient with a PS 1 a bronchial adenocarcinoma of the right upper lobe is found. The tumour measures 3.5 cm. PET-CT reveals metastases in the suprarenal glands, several vertebrae and 2 lesions in the liver. The patient is a heavy smoker (60 pack-years) and drinks 0.5 litre of red wine/day. He is known to have gout and mild cutaneous psoriasis. The PD-L1 expression in the tumour cells is 55%, no EGFR, ALK or ROS-1 mutations are found.

Which treatment will result in the best overall survival?

A) Pembrolizumab

B) Nivolumab

C) Cisplatin and pemetrexed

D) Cisplatin, gemcitabine and bevacizumab

E) Carboplatin, paclitaxel and bevacizumab

A72

Which virus is most frequently involved in the pathogenesis of nasopharyngeal carcinoma?

A) EBV

B) HBV

C) HCV

D) HIV

E) HPV

A73

A 70-year-old man was found to have a gastric GIST (gastrointestinal stromal tumour). Following submucosal tumour excision, the final classification was pT2 (2 cm), R0, mitotic activity < 5/50 HPF.
Which is the appropriate management?

A) Adjuvant therapy with imatinib 400 mg/d for 1 year

B) Adjuvant therapy with imatinib 400 mg/d for 3 years

C) Adjuvant therapy with imatinib 800 mg/d in case of KIT exon 9 mutation

D) Follow-up care

E) Second operation with gastrectomy and lymphadenectomy

A74

Reference: ESMO_Guidelline_NSCLC_oncogene_addicted_2022_PIIS0923753422047858 Oncogene-addicted metastatic non-small-cell lung cancer: ESMO Clinical Practice Guideline for diagnosis, treatment and follow-up5 L. E. Hendriks et al. https://doi.org/10.1016/j.annonc.2022.12.009 Emerging therapeutics and evolving assessment criteria for intracranial metastases in patients with oncogene-driven non-small-cell lung cancer Kelsey Pan 1 , Kyle Concannon 1 , Jing Li 2 , Jianjun Zhang 3 , John V Heymach 3 , Xiuning Le 4 Nat Rev Clin Oncol. 2023 Oct;20(10):716-732. doi: 10.1038/s41571-023-00808-4. Epub 2023 Aug 17. PMID: 37592034 DOI: 10.1038/s41571-023-00808-4

Which of the following targeted therapies in stage IV NSCLC has the lowest CNS efficacy?

A) Osimertinib

B) Brigatinib

C) Erlotinib

D) Lazertinib

E) Lorlatinib

A75

Reference: ESMO_Guidelline_NSCLC_oncogene_addicted_2022_PIIS0923753422047858 Oncogene-addicted metastatic non-small-cell lung cancer: ESMO Clinical Practice Guideline for diagnosis, treatment and follow-up5 L. E. Hendriks et al. https://doi.org/10.1016/j.annonc.2022.12.009

Which of the following treatment options is **NOT** standard in first-line therapy of oncogene-addicted stage IV NSCLC?

A) EGFR Exon19 mutation - Afatinib

B) ALK translocation - Brigatinib

C) RET translocation - Selpercatinib

D) KRAS G12C mutation - Sotorasib

E) ROS1 translocation - Entrectinib

A76

Reference: label for 5HT3 drugs

All of the following are common side-effects of the anti-emetic drug class serotonin 5-hydroxytryptamine (5HT3) antagonists, **EXCEPT**:

A) Headaches

B) Constipation

C) ECG-changes

D) Extrapyramidal symptoms

E) Fatigue

A77

Reference: any oncology textbook

All of the following drugs are alkylating agents, **EXCEPT**:

A) Vincristine

B) Dacarbazine

C) Chlorambucil

D) Temozolomide

E) Ifosfamide

A78

Reference: Cancer of unknown primary: ESMO Clinical Practice Guideline for diagnosis, treatment and follow-up Ann Oncol. 2023;34(3):228-246. Krämer A, Bochtler T, Pauli C, et al, on behalf of the ESMO Guidelines Committee.

Which of the following pairs is **NOT** a corresponding favorable CUP subtype according to the ESMO Guidelines?

A) Women with isolated axillary lymph node metastases -> breast-like CUP

B) Adenocarcinoma with CK7-, CK20+, CDX2+ IHC -> colon-like CUP

C) Squamous cell carcinoma involving non-supraclavicular cervical lymph nodes -> lung cancer-like CUP

D) Women with peritoneal carcinomatosis of a serous papillary adenocarcinoma -> ovary-like CUP

E) Men with blastic bone metastases and/or IHC or serum PSA expression -> prostate-like CUP

A79

Reference: Hertz DL, Sahai V. Including DPYD on Cancer Genetic Panels to Prevent Fatal Fluoropyrimidine Toxicity. J Natl Compr Canc Netw 2020;18(4):372-374.

Which of the following statements is **NOT** correct, regarding dihydropyrimidine dehydrogenase (*DPYD*) testing?

A) Approximately 7% of white patients carry pathogenic germline variants in *DPYD*, the gene encoding the DPD enzyme

B) These pathogenic variants reduce DPD activity and substantially increase risk of severe and sometimes fatal toxicity

C) A positive *DPYD* test does not necessarily predict severe toxicity from standard fluoropyrimidine dosing

D) A negative test does not exclude the possibility of toxicity from standard fluoropyrimidine dosing

E) Patients with complete DPD deficiency should receive reduced dose of fluoropyrimidines by 50%

A80

Which of the following statements regarding the treatment of follicular lymphoma (grade 1, 2) is **NOT** correct?

A) In case of transformation to aggressive lymphoma, an anthracycline-based regimen should be used

B) In case of relapse within 6 months, a non-cross-resistant regimen should be used

C) In patients with non-bulky stage I or II disease, radiotherapy is the preferred treatment

D) Observation is appropriate in asymptomatic patients with non-bulky advanced stage disease

E) Rituximab maintenance treatment improves overall survival

Type K – Quadruple
Correct (T)
Incorrect (F)
The correct answers are marked in **bold**

K1

A 53-year-old man presents with stool irregularities and intermittent blood in the stool. The gastroenterologist performed a flexible colonoscopy and found tumour causing a subtotal stenosis, 12 cm above the anal verge. Biopsy showed an adenocarcinoma.
Which further staging procedures are needed?

A) MRI of the pelvis

B) Post-operative colonoscopy

C) Rigid endoscopy

D) Thoracoabdominal CT

K2

In case of a creatinine clearance < 30 ml/min, which agent(s) require(s) dose reduction?

A) Bleomycin

B) Capecitabine

C) Doxorubicin

D) Vincristine

K3

Which of the following drugs is/are mainly metabolized and/or excreted by the liver and therefore need/s dose adjustment in patients with impaired liver function?

A) Taxanes

B) Anthracyclines

C) Methotrexate

D) Platinum salts

K4

Which of the following items are included in the G8-geriatric screening tool?

A) Weight loss

B) Karnofsky scale

C) Mobility

D) Neuropsychological problems

K5

Positive staining of TTF-1 is typically seen in:

A) Adenocarcinoma of the lung

B) Small-cell lung cancer

C) Thyroid carcinoma

D) Renal cell carcinoma

K6

A 37-year-old male patient presents with a unilateral testicular mass, suspicious for testicular cancer on ultrasound. CT scan shows no further abnormalities and tumour markers (LDH, HCG and AFP) are normal. He subsequently underwent an inguinal orchiectomy. Pathology report showed a seminoma (5 cm without rete testis invasion).

Based on the ESMO guidelines which of the following treatment strategies should be discussed with the patient?

A) Surveillance

B) 1 cycle of BEP (bleomycin, etoposide, cisplatin)

C) 1 cycle of carboplatin AUC 7

D) Retroperitoneal lymph node dissection

K7

A 72-year-old patient was diagnosed with a 4 cm GIST in the distal rectum. Molecular analysis shows a KIT exon 11 mutation. FDG-PET-CT scan confirmed localized disease.

What is part of an appropriate management?

A) Surgery with lymphadenectomy and wide margins

B) Neoadjuvant treatment with imatinib

C) Neoadjuvant chemoradiotherapy

D) Neoadjuvant avapritinib

K8

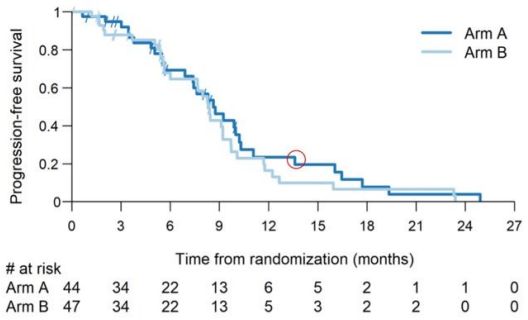
What is correct concerning prophylactic cranial irradiation (PCI) in patients treated with chemoradiotherapy for stage II/III small-cell lung cancer?

A) It is recommended for patients with performance status ECOG 0 or 1

B) It prolongs overall survival

C) The recommended dose is 25 Gy in 10 fractions

D) Hippocampal-sparing PCI is recommended as it has been shown to reduce cognitive decline



K9

Progression-free survival (PFS) is defined as time from randomization to disease progression or death of any cause. Above are the Kaplan-Meier curves of progression-free survival from a randomized controlled phase II trial.

Which statement(s) is/are correct?

A) Median PFS in both treatment arms is approx. 5 months

B) Each time the curve goes down a step (red circle) a patient was lost to follow-up

C) At 12 months the number of patients at risk is 11

D) The hazard ratio for progression is approx. 0.4

K10

A 55-year-old woman with the diagnosis of metastatic NSCLC recently started with chemo-immunotherapy. Re-staging after 2 cycles showed progression of bone metastases. In addition to a CT scan, an MRI of the spine was performed (see below).

Which symptoms would you expect?

A) Pain in the lumbar spine

B) Peripheral polyneuropathy

C) Urinary incontinence

D) Paraparesis of the legs

K11

Reference: ESMO_Guidelines_CUP_2023_PIIS092375342204769X Cancer of unknown primary: ESMO Clinical Practice Guideline for diagnosis, treatment and follow-up5 A. Krämer et al. https://doi.org/10.1016/j.annonc.2022.11.013

A 40-year-old patient is diagnosed with cervical lymph node metastasis.
Which of the mentioned positive immunohistochemical results leads towards the diagnosis of lung cancer?

A) TTF-1

B) CK7

C) CK20

D) SALL4

K12

Reference: ESMO guidelines colorectal cancer

A 55-year-old patient is newly diagnosed with an adenocarcinoma of the left-sided colon with multiple metastases to the liver and the lung. His performance status is excellent, and he has no comorbidities.

Which biomarker analyses are essential to determine the appropriate systemic treatment?

A) RAS mutations

B) MLH1, PMS2, MSH2, MSH6 immunohistochemical expression

C) PD-L1 expression

D) Claudin 18.2 expression

K13

Reference: Mosele F, Remon J, Mateo J, et al: Recommendations for the use of next-generation sequencing (NGS) for pa- tients with metastatic cancer: A report from the ESMO Precision Medicine Working Group. Ann Oncol 31:1491-1505, 2020

Which of the following genomic alterations are classified as ESCAT (ESMO Scale for Clinical Actionability of molecular Targets) class IA in advanced breast cancer?

A) ERBB2 amplification

B) PIK3CA hotspot mutations

C) ESR1 mutations

D) MDM2 amplification

K14

Reference: High-grade glioma: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up, Stupp et al. 2014 Radiotherapy plus Concomitant and Adjuvant Temozolomide for Glioblastoma, Stupp R et al. NEJM 2005

After surgery, radiotherapy plus concomitant and maintenance temozolomide is the current standard of care for patients with glioblastoma. Select the correct statements:

A) The addition of temozolomide significantly improved median, 2- and 5-year survival in a large randomised trial

B) Temozolomide is administered daily (7 days a week) during radiotherapy

C) The most frequent haematologic effect of temozolomide is neutropenia

D) The benefit of temozolomide is larger in the subgroup of patient with MGMT gene promoter methylation

K15

Reference: Oral Cavity Cancer Surgical and Nodal Management: A Review from the American Head and Neck Society. JAMA Otolaryngol Head Neck Surg. 2023 Dec 28. doi: 10.1001/jamaoto.2023.4049. Online ahead of print. PMID: 38153725

A 57-year-old man is diagnosed with a squamous cell cancer of the oral cavity. The PET-CT scan shows a 12x16x14 mm lesion at the base of the tongue and lymph node metastases (24x20x44 mm) in level II and III on the left cervical side.
What is recommended according to the current Guidelines?

A) Palliative radiotherapy

B) Definitive chemoradiotherapy

C) Neoadjuvant chemotherapy and curative resection

D) Primary resection and adjuvant radiotherapy if extracapsular nodal extension is present

K16

Reference: Statistical interpretation and comparison of waterfall plots. Huan M et al. JCO Clinical Cancer Informatics 2023 Sep;7: e2300132

Waterfall plots are popular visualisation tools in oncology studies and allow for the assessment of:

A) Median overall survival

B) Median progression free survival

C) Individual tumour size change

D) Depth of response

K17

Reference: Brukinsa product informiation

Zanubrutinib is an inhibitor of the enzyme Bruton's tyrosine kinase (BTK) and is used in the treatment of B-cell lymphoid malignancies.

Which are characteristics of zanubrutinib?

A) Covalent irreversible inhibitor of BTK

B) Activation of B-cell receptor signaling

C) Targeting the ATP-binding site

D) No oral absorption

K18

Reference: General knowledge

Which measurements are used to prevent/treat tumour lysis syndrome in malignant lymphomas?

A) Hydration

B) Rasburicase

C) Prephase treatment with corticosteroids

D) Urine acidification

K19

Which statement(s) is/are true with regard to serum markers of testicular germ cell tumours?

A) Alpha-foetoprotein is only produced by testicular germ cell tumours

B) Alpha-foetoprotein serum level is elevated in 25% of the patients with pure seminomas

C) High serum levels of beta-HCG (> 50.000 U/l) can cause clinical hyperthyroidism

D) The serum half-life of beta-HCG is 1.5-3 days

K20

In surgically resected stage II colorectal cancer, the following clinico-pathological risk feature(s) is/are associated with decreased survival:

A) Fewer than 10 lymph nodes analyzed

B) Microsatellite-instable (MSI-high) tumours

C) T4 disease

D) Undifferentiated tumours