

Colorectal Cancer

103 questions in three levels, with answer key

For NEET-PG, USMLE, DNB and DM revision and for classroom tests. Level 1 covers core facts; Level 2 tests applied reasoning (calculations, imaging and fluid findings, trial interpretation, sequencing); Level 3 covers landmark trials and newer therapies. Answers and explanations are at the end. No drug doses.

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Level 1 · Basics

Q1. Diagnosis A 66-year-old man has haemoglobin 8.4 g/dL, MCV 68 fL and ferritin 6 ng/mL. He has no gastrointestinal symptoms and eats a mixed diet. What is the most appropriate next step?

- A Stool for occult blood; endoscopy only if positive
- B CEA estimation
- C Colonoscopy and upper GI endoscopy
- D Haemoglobin electrophoresis
- E Oral iron and review in 3 months

Q2. Diagnosis Which presentation is most typical of a carcinoma of the caecum?

- A Early large-bowel obstruction
- B Pencil-thin stools
- C Tenesmus
- D Bright red blood coating the stool
- E Iron-deficiency anaemia and fatigue

Q3. Diagnosis A 58-year-old woman has bled per rectum for 4 months; haemorrhoids were seen on proctoscopy and treated, but bleeding continues. What should be done?

- A Repeat proctoscopy in 6 months
- B Reassure, as the source is identified
- C Barium meal follow-through
- D Colonoscopy to examine the whole colon
- E Haemorrhoidectomy

Q4. Diagnosis Which hereditary syndrome is the commonest cause of inherited colorectal cancer?

- A Lynch syndrome
- B MUTYH-associated polyposis
- C Familial adenomatous polyposis
- D Juvenile polyposis
- E Peutz-Jeghers syndrome

Q5. Diagnosis Familial adenomatous polyposis is caused by a germline mutation in which gene?

- A MLH1
- B APC
- C STK11
- D SMAD4
- E MUTYH

Q6. Diagnosis A patient with *Streptococcus gallolyticus* (bovis) endocarditis should also have:

- A Upper GI endoscopy only
- B Colonoscopy
- C Bone marrow biopsy
- D CT brain
- E Mammography

Q7. Diagnosis Most colorectal cancers develop through which sequence?

- A Hyperplastic polyp → carcinoma in all cases
- B Normal mucosa → carcinoma within months
- C Normal mucosa → adenoma → carcinoma over about 10 years
- D Hamartoma → carcinoma
- E Ulcerative colitis → carcinoma in most cases

Q8. Diagnosis Which molecular route underlies most sporadic MSI-high colorectal cancers?

- A Serrated pathway with BRAF V600E and MLH1 promoter methylation
- B HER2 amplification
- C Germline MSH2 mutation
- D TP53 germline mutation
- E APC loss followed by KRAS mutation

Q9. Diagnosis The faecal immunochemical test (FIT) detects:

- A Tumour DNA
- B Human globin in stool
- C Calprotectin
- D Carcinoembryonic antigen
- E Peroxidase activity of haem

Q10. Diagnosis What should happen after a positive FIT screening test?

- A Colonoscopy
- B Flexible sigmoidoscopy only
- C CT abdomen
- D Serum CEA
- E Repeat FIT in 1 year

Q11. Diagnosis For a person with one first-degree relative diagnosed with colorectal cancer at 52, screening colonoscopy should usually begin at:

- A 50 years
- B 40 years
- C 55 years
- D 60 years
- E 25 years

Q12. Diagnosis Which investigation is essential for local staging of rectal cancer?

- A Barium enema
- B PET-CT
- C CEA
- D High-resolution MRI pelvis
- E Transabdominal ultrasound

Q13. Diagnosis In the AJCC 8th edition, a colon cancer invading through the visceral peritoneum without involving adjacent organs is:

- A T2
- B T4b
- C T3
- D T4a
- E Tis

Q14. Diagnosis A resected colon cancer is pT3 with 5 of 18 lymph nodes involved and no metastases. The stage is:

- A Stage III (N1b)
- B Stage IV
- C Stage III (N2a)
- D Stage II
- E Stage I

Q15. Diagnosis What is the minimum number of lymph nodes recommended for adequate staging of colon cancer?

- A 20
- B 4
- C 12
- D 6
- E 30

Q16. Diagnosis What is the main role of CEA in colorectal cancer?

- A Choosing adjuvant chemotherapy
- B Baseline and post-treatment surveillance
- C Deciding RAS status
- D Diagnosis of cancer in symptomatic patients
- E Population screening

Q17. Diagnosis This schematic barium enema shows a short, irregular annular narrowing with overhanging edges. The most likely diagnosis is:

- A Ischaemic colitis
- B Sigmoid volvulus
- C Diverticular stricture
- D Crohn's disease
- E Colorectal carcinoma

Q18. Diagnosis This schematic colonoscopy view shows a lobulated polyp on a stalk. Endoscopic removal shows adenocarcinoma confined to the head, grade 2, no lymphovascular invasion, margin 2 mm, low budding. What next?

- A Repeat polypectomy at the same site immediately
- B Surveillance colonoscopy; no further surgery
- C Radiotherapy
- D Chemotherapy
- E Segmental colectomy

Q19. Diagnosis Mismatch-repair (MMR) testing in colorectal cancer is recommended for:

- A Only right-sided tumours
- B Only metastatic disease
- C Only patients with a family history
- D Only patients under 50
- E Every newly diagnosed colorectal cancer

Q20. Diagnosis This schematic immunohistochemistry shows tumour nuclei lacking MSH2 and MSH6 with retained MLH1 and PMS2. What is the next step?

- A MLH1 promoter methylation testing
- B Repeat the stain on another block
- C Genetic counselling and germline testing for Lynch syndrome
- D No further action
- E BRAF V600E testing to show it is sporadic

Q21. Metastatic Before cetuximab or panitumumab is used in metastatic colorectal cancer, which test is mandatory?

- A CEA level
- B Extended RAS (KRAS and NRAS) mutation testing
- C EGFR immunohistochemistry
- D PD-L1
- E UGT1A1 only

Q22. Treatment Total mesorectal excision (TME) involves:

- A Lateral pelvic node dissection in every patient
- B Excising the anal sphincter in all cases
- C Removing the rectum with its intact fatty envelope and nodes along the mesorectal fascia
- D Removing only the tumour with a 1 cm margin
- E Removing the whole colon and rectum

Q23. Treatment Which operation is standard for a carcinoma of the caecum?

- A Right hemicolectomy
- B Anterior resection
- C Hartmann's procedure
- D Left hemicolectomy
- E Abdominoperineal resection

Q24. Treatment A low rectal cancer invades the external anal sphincter. The usual operation is:

- A Right hemicolectomy
- B Local excision
- C Sigmoid colectomy
- D Low anterior resection
- E Abdominoperineal resection with a permanent colostomy

- Q25. Treatment** A 60-year-old has a resected stage III (pT3 N1) colon cancer, pMMR. Which adjuvant treatment is standard?
- A Pelvic radiotherapy
 - B No further treatment
 - C Oxaliplatin-based chemotherapy (CAPOX for 3 months)
 - D Bevacizumab for 1 year
 - E Cetuximab for 6 months
- Q26. Treatment** Which drug is an oral prodrug of 5-fluorouracil?
- A Oxaliplatin
 - B Irinotecan
 - C Regorafenib
 - D Capecitabine
 - E Leucovorin
- Q27. Treatment** Cold-induced tingling of the fingers and throat discomfort during infusion is typical of:
- A Oxaliplatin
 - B Irinotecan
 - C Cetuximab
 - D Capecitabine
 - E Bevacizumab
- Q28. Metastatic** An acneiform rash on the face and upper trunk in a patient with metastatic colorectal cancer is most likely caused by:
- A Trifluridine–tipiracil
 - B Panitumumab or cetuximab
 - C Irinotecan
 - D Oxaliplatin
 - E Bevacizumab
- Q29. Metastatic** Which side effect is characteristic of bevacizumab?
- A Cold-triggered neuropathy
 - B Hand-foot syndrome
 - C Acneiform rash
 - D Hypomagnesaemia
 - E Hypertension and proteinuria
- Q30. Metastatic** Acute cholinergic syndrome (sweating, cramps, early diarrhoea) during infusion is typical of:
- A Irinotecan
 - B Capecitabine
 - C Panitumumab
 - D Bevacizumab
 - E Oxaliplatin
- Q31. Treatment** After curative resection of colon cancer with a complete preoperative colonoscopy, the first surveillance colonoscopy is usually done at:
- A 3 months
 - B 5 years
 - C 1 year
 - D 10 years
 - E Only if symptoms develop
- Q32. Diagnosis** Which dietary factor is most consistently linked with increased colorectal cancer risk?
- A Vegetarian diet
 - B Spicy food
 - C Rice
 - D Milk
 - E Processed meat

Q33. Diagnosis A right iliac fossa mass with weight loss in a 40-year-old Indian man is reported on CT as "ileocaecal thickening, likely TB". The most appropriate next step is:

- A Right hemicolectomy without biopsy
- B Mantoux test and start ATT if positive
- C Ultrasound follow-up in 3 months
- D Colonoscopy with multiple biopsies for histology, TB PCR and culture
- E Start antituberculous treatment for 6 months

Level 2 · Applied & innovative

Q34. Diagnosis This schematic axial T2-weighted MRI shows a mid-rectal tumour reaching to within 1 mm of the dashed line. What does the dashed line represent and what does the finding imply?

- A Seminal vesicle; tumour is T4b
- B Rectal wall; tumour is T1
- C Peritoneal reflection; no change in plan
- D Mesorectal fascia; threatened circumferential margin → total neoadjuvant therapy before surgery
- E Levator ani; abdominoperineal resection needed

Q35. Diagnosis In NordICC, an invitation to a single screening colonoscopy reduced colorectal cancer incidence at 10 years but not significantly mortality (intention to screen). The main reason was:

- A FIT was given to the control group
- B Only about 42% of those invited attended
- C The trial excluded people over 50
- D Polypectomy increases cancer risk
- E Colonoscopy misses most cancers

Q36. Diagnosis A screening programme offers FIT every 2 years to 10,000 adults; 6% test positive and 4% of positives have cancer. How many colonoscopies are needed to find one cancer among FIT-positives?

- A 25
- B 100
- C 6
- D 250
- E 4

Q37. Diagnosis A 55-year-old has an obstructing sigmoid cancer; the colonoscope cannot pass it. CT shows no metastases. Before elective resection, how should the proximal colon be assessed?

- A CT colonography, or colonoscopy within 3–6 months after surgery
- B Barium meal
- C No assessment is needed
- D PET-CT
- E Capsule endoscopy of the small bowel

Q38. Diagnosis MRI pelvis of a rectal cancer shows the lower edge 4 cm from the anal verge, cT3b N1, CRM 6 mm, no EMVI, sphincter intact. Which of the following is TRUE?

- A It is T4b
- B It is a low rectal tumour; the CRM is clear
- C The CRM is threatened
- D It is an upper rectal tumour
- E It must be treated as anal cancer

Q39. Diagnosis A colon cancer shows loss of MLH1 and PMS2 on immunohistochemistry. Which result makes Lynch syndrome unlikely?

- A Endometrial cancer in the mother
- B Loss of MSH6 as well
- C Patient age 38
- D KRAS G12D mutation
- E BRAF V600E mutation in the tumour

Q40. Diagnosis Which pair of proteins is usually lost together on MMR immunohistochemistry because they form heterodimers?

- A MSH2 with PMS2
- B MLH1 with PMS2, and MSH2 with MSH6
- C MLH1 with MSH2
- D PMS2 with MSH6
- E MLH1 with MSH6

Q41. Diagnosis Two siblings both have about 40 colorectal adenomas each in their 40s; neither parent has polyps. The most likely diagnosis is:

- A Lynch syndrome
- B Classic FAP
- C Sporadic adenomas
- D Peutz–Jeghers syndrome
- E MUTYH-associated polyposis

Q42. Treatment In MOSAIC, adding oxaliplatin to 5-FU/leucovorin improved 6-year overall survival in stage III colon cancer by about 4 percentage points. How many patients need adjuvant FOLFOX instead of 5-FU/LV for one additional survivor at 6 years?

- A About 24
- B About 100
- C About 4
- D About 2
- E About 400

Q43. Treatment In the IDEA collaboration, which patients did as well with 3 months of CAPOX as with 6 months?

- A Stage IV after liver resection
- B All patients receiving FOLFOX
- C Stage II dMMR
- D Low-risk stage III (T1–3 N1)
- E High-risk stage III (T4 or N2)

Q44. Treatment A 50-year-old has a resected pT3 N0 colon cancer, 22 nodes examined, no high-risk features, dMMR. What is the best adjuvant approach?

- A CAPOX for 3 months
- B Pelvic radiotherapy
- C Pembrolizumab for 1 year
- D Observation
- E Fluoropyrimidine alone for 6 months

Q45. Treatment A 78-year-old with resected stage III colon cancer is fit but has diabetic neuropathy. Which adjuvant option is most appropriate?

- A FOLFOX for 6 months
- B FOLFOXIRI
- C Bevacizumab with capecitabine
- D Capecitabine alone
- E No treatment because of age

Q46. Treatment During the first cycle of capecitabine a patient develops severe mucositis, diarrhoea and neutropenia. Which germline test is most relevant?

- A TPMT genotyping
- B UGT1A1 genotyping
- C HLA-B*5801
- D BRCA1/2
- E DPYD genotyping

Q47. Treatment In FOxTROT, what happened when 6 weeks of FOLFOX was given before surgery for radiologically locally advanced colon cancer?

- A Fewer patients had residual or recurrent disease at 2 years, with tumour downstaging
- B Surgical complications doubled
- C All patients avoided surgery
- D Overall survival was worse
- E dMMR tumours responded best

Q48. Treatment In the Dutch TME trial, short-course preoperative radiotherapy before TME:

- A Improved overall survival in all subgroups
- B Made TME unnecessary
- C Was given with concurrent oxaliplatin
- D Increased local recurrence
- E Reduced local recurrence substantially

Q49. Treatment The German CAO/ARO/AIO-94 trial compared preoperative with postoperative chemoradiation for rectal cancer. Preoperative treatment:

- A Increased anastomotic leaks
- B Reduced sphincter preservation
- C Lowered local recurrence and toxicity, without changing overall survival
- D Improved overall survival
- E Was inferior for local control

Q50. Treatment Which statement about total neoadjuvant therapy (TNT) for rectal cancer is correct?

- A It means surgery first, then all chemotherapy
- B It omits radiotherapy in all patients
- C It gives all chemotherapy and radiotherapy before surgery and raises complete response rates
- D It is reserved for stage I disease
- E It replaces MRI staging

Q51. Treatment In PROSPECT, which patients could safely omit routine pelvic radiotherapy?

- A All T4 tumours
- B Metastatic rectal cancer
- C Low tumours invading the sphincter
- D cT2N1 or cT3N0–1 rectal cancer, CRM clear, suitable for sphincter-sparing surgery, responding to FOLFOX
- E Tumours with a threatened CRM

Q52. Treatment After TNT for low rectal cancer, endoscopy shows a flat white scar with telangiectasia, there is no palpable tumour and MRI shows only fibrosis. The best option for a patient keen to avoid a stoma is:

- A Palliative care
- B Watch-and-wait with intensive surveillance
- C Further chemotherapy for 6 months
- D Discharge to the family doctor
- E Immediate abdominoperineal resection

Q53. Treatment Which feature on rectal MRI most strongly suggests a need for lateral pelvic node assessment or treatment?

- A Tumour height 12 cm
- B A mesorectal node of 3 mm
- C CRM of 8 mm
- D A lateral pelvic node with a short axis of 7 mm or more
- E T2 tumour

Q54. Treatment Low anterior resection syndrome (LARS) refers to:

- A Urinary retention after abdominoperineal resection
- B Urgency, frequency, clustering and incontinence after sphincter-saving rectal surgery
- C Anastomotic leak in the first week
- D Oxaliplatin-induced diarrhoea
- E Stoma prolapse

- Q55. Metastatic** In PARADIGM, adding panitumumab rather than bevacizumab to first-line FOLFOX improved overall survival in which group?
- A Right-sided tumours
 - B dMMR tumours
 - C RAS-mutant tumours
 - D RAS wild-type, left-sided metastatic colorectal cancer
 - E BRAF V600E tumours
- Q56. Metastatic** A fit 52-year-old has metastatic right-sided colon cancer, KRAS G12D mutant, pMMR, unresectable liver metastases. Which first-line treatment is most appropriate?
- A FOLFOX or FOLFIRI with bevacizumab (FOLFOXIRI + bevacizumab if very fit)
 - B Pembrolizumab
 - C Sotorasib
 - D FOLFOX with cetuximab
 - E Encorafenib with cetuximab
- Q57. Metastatic** KEYNOTE-177 compared pembrolizumab with chemotherapy as first-line treatment for MSI-high metastatic colorectal cancer. The median progression-free survival was:
- A About 40 vs 30 months, favouring chemotherapy
 - B About 16.5 vs 8.2 months, favouring pembrolizumab
 - C Not reported
 - D Similar in both arms
 - E Shorter with pembrolizumab
- Q58. Metastatic** This schematic contrast CT shows several liver lesions in both lobes in a patient with a rectal primary. What determines whether they can be resected?
- A Age over 60
 - B The number of lesions alone (more than 4 is never resectable)
 - C Whether an R0 resection can leave an adequate future liver remnant with inflow, outflow and biliary drainage
 - D Whether the lesions are bilobar
 - E The CEA level
- Q59. Metastatic** In JCOG1007, patients with asymptomatic primary tumours and unresectable synchronous metastases were randomised to primary resection before chemotherapy or chemotherapy alone. The result was:
- A Chemotherapy alone was harmful
 - B No survival benefit from resecting the primary, with more postoperative deaths
 - C Resection reduced later obstruction to zero
 - D Survival doubled with resection
 - E The trial included only rectal cancers
- Q60. Metastatic** Third-line treatment of RAS-mutant metastatic colorectal cancer in a patient with ECOG 1. Which option improved overall survival over its comparator in SUNLIGHT?
- A Capecitabine alone
 - B Tamoxifen
 - C Cetuximab plus irinotecan
 - D Trifluridine-tipiracil plus bevacizumab
 - E Pembrolizumab
- Q61. Metastatic** Which statement about anti-EGFR rechallenge in metastatic colorectal cancer is correct?
- A It is first-line therapy
 - B It works best when plasma ctDNA shows RAS wild-type again after a treatment-free interval
 - C It requires a new tissue biopsy showing EGFR overexpression
 - D It is effective in RAS-mutant tumours
 - E It is contraindicated after any previous anti-EGFR therapy

- Q62. Diagnosis** Which of these patients most needs germline genetic testing?
- A A 78-year-old with an MLH1-deficient, BRAF V600E-mutant caecal cancer
 - B A 60-year-old with a 6 mm tubular adenoma
 - C A 44-year-old with a dMMR colon cancer, MSH2 loss
 - D A 70-year-old with a hyperplastic rectal polyp
 - E A 65-year-old with a pMMR sigmoid cancer and no family history
- Q63. Diagnosis** This schematic H&E shows cells with large mucin vacuoles pushing the nuclei to one side. Which statement about this histology in colorectal cancer is correct?
- A It responds best to anti-EGFR therapy
 - B It is a benign finding
 - C Signet-ring cell carcinoma carries a poor prognosis and a propensity for peritoneal spread; it is relatively more frequent in young Indian patients
 - D It indicates a neuroendocrine tumour
 - E It always arises in FAP
- Q64. Treatment** A patient on FOLFOX develops numbness in both hands that makes buttoning shirts difficult between cycles. What is the most appropriate action?
- A Give steroids and continue
 - B Add bevacizumab
 - C Switch to cetuximab
 - D Stop oxaliplatin and continue the fluoropyrimidine
 - E Continue FOLFOX unchanged
- Q65. Treatment** The CHALLENGE trial showed that, after adjuvant chemotherapy for colon cancer, a structured exercise programme:
- A Improved disease-free and overall survival
 - B Was harmful in older patients
 - C Improved only quality of life
 - D Increased recurrence
 - E Had no effect on outcomes

Level 3 · Challenging

- Q66. Treatment** A 46-year-old has a resected stage IIIB colon cancer that is dMMR (MLH1/PMS2 loss, BRAF wild-type, no MLH1 methylation). Which adjuvant option is supported by a phase 3 trial specifically in this group?
- A FOLFOX plus atezolizumab (ATOMIC)
 - B Pembrolizumab alone for 1 year
 - C No adjuvant therapy because dMMR has a good prognosis
 - D Capecitabine alone
 - E FOLFOXIRI
- Q67. Treatment** A 39-year-old has a radiologically T4 N2 dMMR sigmoid cancer without metastases. Which neoadjuvant approach produced major pathological responses in about 95% of patients?
- A Capecitabine chemoradiation
 - B FOLFOX for 6 weeks (FOXROT)
 - C Short-course radiotherapy
 - D Bevacizumab plus FOLFOX
 - E Nivolumab plus ipilimumab for two cycles (NICHE-2)
- Q68. Treatment** A 31-year-old with a mid-rectal cT3 N1 cancer is booked for chemoradiation. MMR IHC shows loss of MSH2 and MSH6. What is the most appropriate change?
- A Add oxaliplatin to chemoradiation
 - B Give bevacizumab with FOLFOX
 - C Proceed with chemoradiation as planned
 - D Offer anti-PD-1 therapy alone with close response assessment, reserving chemoradiation and surgery
 - E Proceed to abdominoperineal resection

Q69. Treatment In RAPIDO, short-course RT followed by chemotherapy before TME (versus long-course chemoradiation) was associated with which long-term concern?

- A Lower pathological complete response
- B More postoperative deaths
- C Higher locoregional failure at 5 years
- D Higher rates of distant metastasis
- E Worse disease-related treatment failure

Q70. Treatment Which TNT sequence is generally favoured when the main goal is organ preservation in low rectal cancer?

- A Short-course RT with immediate surgery
- B Induction chemotherapy followed by chemoradiation
- C Chemoradiation followed by consolidation chemotherapy
- D Surgery followed by adjuvant chemotherapy
- E Chemotherapy alone

Q71. Treatment In the International Watch & Wait Database, which statement about local regrowth after clinical complete response is correct?

- A About a quarter regrow, and almost 90% of regrowths occur within 2 years
- B Most regrowths appear after 5 years
- C Regrowth is rare (under 2%)
- D Regrowth is always accompanied by liver metastases
- E Regrowth is never salvageable

Q72. Treatment A 68-year-old with an upper rectal cancer (lower edge 12 cm) has cT3a NO, CRM 9 mm, no EMVI. Which plan is most appropriate?

- A Abdominoperineal resection
- B Short-course RT then immediate surgery mandatory
- C Watch-and-wait
- D TNT with induction FOLFIRINOX
- E TME (partial mesorectal excision) without neoadjuvant therapy

Q73. Treatment A stage II pMMR colon cancer patient has ctDNA testing after surgery. In DYNAMIC, a ctDNA-guided approach (chemotherapy only if ctDNA positive) compared with standard management:

- A Was used in stage IV disease
- B Improved overall survival significantly
- C Halved the use of adjuvant chemotherapy with non-inferior recurrence-free survival
- D Required chemotherapy for all
- E Increased recurrence

Q74. Treatment Which statement about stage II colon cancer adjuvant therapy is most accurate?

- A All stage II patients need 6 months of FOLFOX
- B Absolute survival benefit from chemotherapy is about 3–4%, so risk features and patient preference guide the decision
- C T4 is not a high-risk feature
- D Fewer than 12 nodes is reassuring
- E dMMR stage II patients benefit most from 5-FU

Q75. Metastatic A 58-year-old has metastatic BRAF V600E, pMMR, RAS wild-type colon cancer and has not had treatment. Which regimen improved overall survival over standard chemotherapy in BREAKWATER?

- A FOLFOX + panitumumab
- B Pembrolizumab
- C Vemurafenib alone
- D Encorafenib + cetuximab + mFOLFOX6
- E Regorafenib

Q76. Metastatic Why is single-agent BRAF inhibitor therapy, effective in melanoma, ineffective in BRAF V600E colorectal cancer?

- A BRAF inhibition causes feedback activation of EGFR, reactivating MAPK signalling
- B MSI-high tumours degrade BRAF inhibitors
- C Colorectal BRAF mutations are not V600E
- D BRAF is not expressed in colon epithelium
- E The drug is not absorbed in colorectal cancer

Q77. Metastatic A patient with KRAS G12C-mutant metastatic colorectal cancer has progressed on oxaliplatin and irinotecan. Which approach has randomised evidence?

- A Encorafenib plus cetuximab
- B Sotorasib alone, as in lung cancer
- C Pembrolizumab
- D Cetuximab alone
- E Sotorasib plus panitumumab (CodeBreak 300)

Q78. Metastatic A RAS/BRAF wild-type, left-sided metastatic tumour is HER2-amplified (IHC 3+). After FOLFOX and FOLFIRI, which is a targeted option?

- A Sotorasib
- B Lapatinib alone
- C Cetuximab plus irinotecan, as HER2 predicts benefit
- D Pembrolizumab
- E Tucatinib plus trastuzumab

Q79. Metastatic CheckMate 8HW in MSI-high metastatic colorectal cancer showed:

- A Chemotherapy was superior to immunotherapy
- B Nivolumab alone was superior to the combination
- C Benefit only in RAS-mutant tumours
- D Nivolumab + ipilimumab improved progression-free survival over both chemotherapy and nivolumab alone
- E No difference between arms

Q80. Metastatic A patient on first-line pembrolizumab for MSI-high colorectal cancer has a 20% increase in liver lesions at 9 weeks but feels better and CEA has fallen. What is the best approach?

- A Stop immunotherapy and switch to chemotherapy immediately
- B Resect the liver lesions urgently
- C Continue and re-image in 4–8 weeks, as this may be pseudoprogression
- D Refer for hospice
- E Add bevacizumab

Q81. Metastatic A patient with metastatic colorectal cancer has a colonic stent in place and is starting first-line chemotherapy. Which biological agent is most problematic?

- A Panitumumab
- B Cetuximab
- C Pembrolizumab
- D Bevacizumab, because of stent-related perforation risk
- E Trastuzumab

Q82. Metastatic In EPOC, perioperative FOLFOX for resectable colorectal liver metastases compared with surgery alone:

- A Had no effect on any endpoint
- B Was given with cetuximab
- C Improved progression-free survival but not overall survival
- D Increased mortality
- E Improved overall survival by 20%

Q83. Metastatic Which statement about cytoreductive surgery and HIPEC for colorectal peritoneal metastases (PRODIGE 7) is correct?

- A Adding oxaliplatin HIPEC to complete cytoreduction gave no survival benefit and more late complications
- B HIPEC is effective without cytoreduction
- C The trial used mitomycin and showed benefit
- D HIPEC doubled overall survival
- E Cytoreduction is harmful in all patients

Q84. Metastatic TRANSMET evaluated liver transplantation for permanently unresectable colorectal liver metastases. The key finding was:

- A Transplant plus chemotherapy markedly improved 5-year overall survival over chemotherapy alone in highly selected patients
- B All patients were cured
- C Transplant was useful even with lung metastases
- D Transplant avoided the need for chemotherapy
- E Transplant was inferior to chemotherapy

Q85. Metastatic A fit 48-year-old has RAS-mutant, pMMR, right-sided colon cancer with liver-only metastases judged potentially resectable. Which first-line regimen gives the best chance of conversion?

- A Capecitabine alone
- B FOLFOXIRI plus bevacizumab
- C Pembrolizumab
- D Trifluridine–tipiracil plus bevacizumab
- E FOLFOX plus cetuximab

Q86. Diagnosis A colon cancer is MSI-high by PCR but MMR immunohistochemistry shows all four proteins intact. The most likely explanation is:

- A The tumour cannot be MSI-high
- B BRAF mutation
- C A missense variant producing a non-functional but antigenically intact protein (or technical discordance)
- D Lynch syndrome is excluded
- E HER2 amplification

Q87. Diagnosis A dMMR colon cancer shows MSH2/MSH6 loss, but germline testing finds no pathogenic variant. What is the most likely explanation, and what should be tested next?

- A MLH1 promoter methylation
- B Laboratory error; ignore the result
- C Constitutional MLH1 epimutation in MSH2
- D BRAF V600E
- E Biallelic somatic MMR mutations ("Lynch-like"); tumour sequencing of MMR genes

Q88. Diagnosis Which of the following is a recognised high-risk feature that makes surgery advisable after endoscopic removal of a malignant colorectal polyp?

- A Clear margin of 2 mm
- B Lymphovascular invasion
- C Size of 1.5 cm
- D Pedunculated shape
- E Grade 2 differentiation

Q89. Treatment In FACS and COLOFOL, more intensive follow-up after curative resection compared with less intensive follow-up:

- A Improved overall survival substantially
- B Showed CEA was useless for detecting relapse
- C Eliminated the need for colonoscopy
- D Increased mortality
- E Found more resectable recurrences (FACS) but did not improve overall survival

Q90. Treatment In CAPP2, aspirin taken for at least 2 years by carriers of Lynch syndrome:

- A Had no effect at any time point
- B Was combined with celecoxib
- C Prevented only endometrial cancer
- D Increased colorectal cancer
- E Reduced the incidence of colorectal cancer with long-term follow-up

Q91. Metastatic In a fit patient with left-sided RAS/BRAF wild-type metastatic colorectal cancer who cannot afford anti-EGFR antibodies, which first-line option is evidence-based and affordable in India?

- A Cetuximab monotherapy
- B Single-agent oxaliplatin
- C Pembrolizumab
- D Doublet chemotherapy (FOLFOX/CAPOX/FOLFIRI) with biosimilar bevacizumab, or chemotherapy alone
- E Best supportive care only

Level 1 · Basics

Q92. Diagnosis A 45-year-old has a single (heterozygous) pathogenic MUTYH variant found on a panel done for her sister, who has MUTYH-associated polyposis. She has no polyps or family colorectal cancer apart from her sister. How should she be screened?

- A Prophylactic colectomy
- B As for the general population (her own risk is at most slightly raised)
- C No screening is ever needed
- D Upper endoscopy every 2 years
- E Colonoscopy every year from now

Level 2 · Applied & innovative

Q93. Diagnosis A 32-year-old with primary sclerosing cholangitis and ulcerative pancolitis in remission asks how often she needs colonoscopy. The correct advice is:

- A Every 10 years from age 45
- B Not needed while on ursodeoxycholic acid
- C Only if she develops symptoms
- D Every 5 years from 8 years after colitis onset
- E Every year, from the time PSC is diagnosed

Q94. Diagnosis A 23-year-old is found to carry a pathogenic MLH1 variant through cascade testing. When should colonoscopy start, and how often?

- A From 45, every 10 years
- B Only after symptoms appear
- C From 30–35, every 3 years
- D From 40, every 5 years
- E From 20–25 (or 2–5 years before the youngest family case), every 1–2 years

Level 3 · Challenging

Q95. Treatment A 38-year-old with Lynch syndrome (MSH2) has a resectable sigmoid cancer. If the aim is to minimise the risk of a new colon cancer, which operation is preferred?

- A Sigmoid colectomy
- B Endoscopic resection
- C Abdominoperineal resection
- D Total colectomy with ileorectal anastomosis
- E Hartmann's procedure

Q96. Treatment After resection of a stage III colon cancer, NGS shows a PIK3CA exon 20 mutation. What adjunctive treatment has randomised evidence in this setting?

- A No adjunctive treatment has evidence
- B Celecoxib for 6 months as the preferred agent
- C High-dose vitamin D
- D Adjuvant cetuximab
- E Low-dose aspirin for 3 years (ALASCCA)

Level 2 · Applied & innovative

Q97. Treatment A patient with resected stage II colon cancer has a 25-hydroxyvitamin D level of 14 ng/mL. What is the most appropriate statement?

- A Vitamin D must not be given during follow-up
- B Replace vitamin D; low levels are linked with worse outcomes but supplementation is not proven to improve survival
- C Vitamin D supplementation is proven to cure micrometastases
- D Vitamin D levels are irrelevant to bone health
- E High-dose vitamin D replaces adjuvant chemotherapy

Q98. Metastatic A patient has had 6 cycles of FOLFOX for colorectal liver metastases and now has steatohepatitis on imaging. For a safe major hepatectomy, the future liver remnant should generally be at least:

- A 30%
- B 70%
- C 50%
- D 10%
- E 20%

Level 3 · Challenging

Q99. Metastatic Before neoadjuvant chemotherapy for liver metastases, a 1.4 cm lesion lies 2 cm deep in segment 7. What should be done first?

- A Biopsy all other lesions
- B Place a fiducial marker, because it may disappear on imaging yet still contain tumour
- C Radioembolise it
- D Resect only lesions visible after chemotherapy
- E Nothing; if it disappears it is cured

Q100. Metastatic In COLLISION, patients with small (≤ 3 cm) resectable colorectal liver metastases were randomised to thermal ablation or surgical resection. What did the trial show?

- A Similar overall survival with fewer complications after ablation
- B Ablation caused more deaths
- C No patients were eligible
- D Much better survival with surgery
- E Ablation was only feasible for lung metastases

Level 2 · Applied & innovative

Q101. Metastatic A patient completed adjuvant FOLFOX 8 months ago and now has unresectable RAS-mutant liver and lung metastases. Which first-line backbone is preferred?

- A FOLFOX with bevacizumab
- B Capecitabine alone
- C FOLFIRI with bevacizumab
- D Oxaliplatin alone
- E FOLFOX with cetuximab

Level 3 · Challenging

Q102. **Metastatic** A pMMR, KRAS G12D-mutant metastatic colorectal cancer is HER2 IHC 3+ and has progressed on oxaliplatin- and irinotecan-based chemotherapy with bevacizumab. Which option is most appropriate?

- A Cetuximab plus irinotecan
- B Tucatinib plus trastuzumab
- C Trastuzumab deruxtecan
- D Pembrolizumab
- E Sotorasib plus panitumumab

Q103. **Diagnosis** A metastatic, MMR-proficient colon cancer in a 41-year-old has a POLE exonuclease-domain mutation with a tumour mutational burden of 150 mutations/Mb. Which first-line treatment is suggested?

- A An immune checkpoint inhibitor regimen, as for dMMR tumours
- B FOLFOX with cetuximab
- C Best supportive care
- D Encorafenib with cetuximab
- E Regorafenib

Answer key

1·C 2·E 3·D 4·A 5·B 6·B 7·C 8·A 9·B 10·A 11·B 12·D 13·D 14·C 15·C 16·B 17·E 18·B 19·E 20·C 21·B
22·C 23·A 24·E 25·C 26·D 27·A 28·B 29·E 30·A 31·C 32·E 33·D 34·D 35·B 36·A 37·A 38·B 39·E 40·B
41·E 42·A 43·D 44·D 45·D 46·E 47·A 48·E 49·C 50·C 51·D 52·B 53·D 54·B 55·D 56·A 57·B 58·C
59·B 60·D 61·B 62·C 63·C 64·D 65·A 66·A 67·E 68·D 69·C 70·C 71·A 72·E 73·C 74·B 75·D 76·A 77·E
78·E 79·D 80·C 81·D 82·C 83·A 84·A 85·B 86·C 87·E 88·B 89·E 90·E 91·D 92·B 93·E 94·E 95·D 96·E
97·B 98·A 99·B 100·A 101·C 102·C 103·A

Explanations

Q1 · C Iron-deficiency anaemia in a man or a post-menopausal woman is gastrointestinal blood loss until proven otherwise. Both endoscopies are needed; a negative occult blood test does not exclude a right-sided cancer, and CEA is not a diagnostic test.

Q2 · E The caecum is wide and its contents are liquid, so right-sided cancers bleed occultly and present with anaemia or a mass; obstruction, tenesmus and altered stool calibre are features of left-sided and rectal tumours.

Q3 · D Haemorrhoids are common and often coexist with a cancer higher up. Persistent bleeding despite treatment, or bleeding over 40–45, needs colonoscopy.

Q4 · A Lynch syndrome (germline mismatch-repair gene variants) accounts for about 3% of colorectal cancers, far more than the polyposis syndromes.

Q5 · B Classic FAP is autosomal dominant due to APC mutations, with hundreds to thousands of adenomas from the teens. MUTYH polyposis is recessive; STK11 causes Peutz–Jeghers; SMAD4 causes juvenile polyposis.

Q6 · B *S. gallolyticus* bacteraemia and endocarditis are associated with colorectal neoplasia; colonoscopy is recommended.

Q7 · C The adenoma–carcinoma sequence (APC, then KRAS, then TP53/SMAD4) takes roughly a decade, which is why polypectomy prevents cancer.

Q8 · A Sporadic MSI-high tumours arise from sessile serrated lesions through BRAF mutation and epigenetic silencing of MLH1; they are typically right-sided in older women.

Q9 · B FIT uses antibodies to human globin, so it needs no dietary restriction and is specific for lower GI bleeding. Guaiac tests detect peroxidase activity and are affected by diet.

Q10 · A A positive FIT means a meaningful chance of cancer or advanced adenoma: colonoscopy within weeks. Repeating the stool test is a common and dangerous error.

Q11 · B Start at 40, or 10 years before the youngest affected relative's age at diagnosis, whichever is earlier; here 40.

Q12 · D MRI pelvis defines T stage, the circumferential resection margin, EMVI, nodes and tumour height, which decide neoadjuvant treatment.

Q13 · D T3 extends into pericorectal tissue; T4a penetrates the visceral peritoneum; T4b invades or adheres to other organs.

Q14 · C N1 is 1–3 nodes, N2a 4–6 and N2b 7 or more. Any nodal involvement without distant metastasis is stage III.

Q15 · C At least 12 nodes should be examined; fewer may understage the cancer and is a high-risk feature in stage II.

Q16 · B CEA is neither sensitive nor specific for diagnosis (raised in smokers and liver disease); it is used at baseline and in follow-up to detect relapse.

Q17 · E An “apple-core” lesion — a short annular narrowing with shouldered edges — is classic for carcinoma. Diverticular strictures are longer and tapered; volvulus shows a bird's-beak.

Q18 · B A malignant pedunculated polyp removed en bloc with a clear margin (≥ 1 mm), grade 1–2, no lymphovascular invasion and low budding has a very low nodal risk; surveillance is enough. The site is tattooed.

Q19 · E Universal MMR testing finds Lynch syndrome that family history misses and guides treatment at every stage.

Q20 · C Loss of MSH2/MSH6 is not explained by BRAF or MLH1 methylation (those apply to MLH1/PMS2 loss). Germline testing is indicated.

- Q21 · B** Anti-EGFR antibodies do not help, and may harm, RAS-mutant tumours. EGFR expression by IHC does not predict benefit.
- Q22 · C** TME is sharp dissection in the embryological plane outside the mesorectal fascia; it reduced local recurrence dramatically and is standard for mid and low rectal cancer.
- Q23 · A** Right hemicolectomy removes the terminal ileum, caecum, ascending colon and hepatic flexure with the ileocolic and right colic vessels and their nodes.
- Q24 · E** Sphincter invasion prevents a safe distal margin with sphincter preservation, so abdominoperineal resection is needed (after neoadjuvant therapy).
- Q25 · C** For low-risk stage III (T1–3 N1), 3 months of CAPOX is enough (IDEA). Biological agents have no role in adjuvant colon cancer treatment.
- Q26 · D** Capecitabine is converted to 5-FU, partly in tumour tissue; it replaced infusional 5-FU in many regimens (X-ACT).
- Q27 · A** Acute cold-triggered neurotoxicity is characteristic of oxaliplatin; with cumulative exposure a persistent sensory neuropathy can develop.
- Q28 · B** EGFR inhibition causes papulopustular rash, paronychia and hypomagnesaemia; the rash often correlates with benefit.
- Q29 · E** Anti-VEGF therapy causes hypertension, proteinuria, bleeding, impaired wound healing, arterial thrombosis and, rarely, perforation.
- Q30 · A** Irinotecan inhibits acetylcholinesterase, causing an early cholinergic syndrome treated with atropine; late diarrhoea is a separate, potentially dangerous toxicity.
- Q31 · C** Colonoscopy at 1 year, then at 3 years and every 5 years, adjusted for findings; earlier (3–6 months) if the colon was not fully examined before surgery.
- Q32 · E** Processed and red meat are associated with higher risk; fibre, whole grains and calcium are associated with lower risk. Spicy food is not a recognised cause.
- Q33 · D** Ileocaecal TB, Crohn's disease, lymphoma and caecal cancer look alike. Tissue for histology and microbiology is needed before any empirical treatment.
- Q34 · D** The mesorectal fascia is the TME plane. Tumour ≤ 1 mm from it predicts an involved margin after surgery alone, so neoadjuvant therapy (usually TNT) is given first.
- Q35 · B** Effectiveness estimates diluted by low uptake; adjusted analyses among attendees suggested larger reductions. Screening works only if people attend.
- Q36 · A** $600 \text{ positives} \times 4\% = 24 \text{ cancers}$; $600/24 = 25 \text{ colonoscopies per cancer found}$ (positive predictive value 4%).
- Q37 · A** Synchronous cancers occur in 3–5%; the whole colon must be examined, by CT colonography before surgery or colonoscopy soon after.
- Q38 · B** Low rectum is under 5 cm, mid 5–10 cm, upper 10–15 cm from the verge. A CRM over 1 mm is clear. Low tumours still matter for sphincter and organ-preservation decisions.
- Q39 · E** BRAF V600E (or MLH1 promoter hypermethylation) indicates sporadic epigenetic MLH1 silencing. Without them, germline testing is needed.
- Q40 · B** MLH1 partners with PMS2 and MSH2 with MSH6. Loss of the major partner (MLH1 or MSH2) leads to loss of its partner; isolated PMS2 or MSH6 loss suggests a variant in that gene.
- Q41 · E** An oligopolyposis (10–100 adenomas) affecting siblings but not parents suggests autosomal recessive MUTYH polyposis.
- Q42 · A** $\text{NNT} = 1/0.042 \approx 24$. Absolute benefit guides counselling better than hazard ratios.
- Q43 · D** For T1–3 N1 disease, 3 months of CAPOX was non-inferior with much less neuropathy; high-risk disease (T4 or N2) did better with 6 months, particularly with FOLFOX.
- Q44 · D** Stage II dMMR cancers have an excellent prognosis and gain nothing from fluoropyrimidine alone. Germline testing for Lynch is still needed.
- Q45 · D** Over 70, oxaliplatin adds little benefit and more toxicity; pre-existing neuropathy also argues against it. A fluoropyrimidine alone is reasonable. Age alone is not a reason to withhold treatment.

- Q46 · E** Dihydropyrimidine dehydrogenase deficiency causes severe, sometimes fatal fluoropyrimidine toxicity. Pre-treatment DPYD testing is recommended where available.
- Q47 · A** Neoadjuvant FOLFOX reduced 2-year residual or recurrent disease (about 17% vs 22%) and downstaged tumours safely; dMMR tumours responded poorly to chemotherapy.
- Q48 · E** Short-course RT (5 × 5 Gy) cut 2-year local recurrence from about 8% to 2% even with quality TME surgery, without an overall survival difference.
- Q49 · C** Preoperative chemoradiation halved local recurrence and caused less toxicity; overall survival was similar.
- Q50 · C** TNT improves delivery of chemotherapy and increases pathological and clinical complete responses, enabling organ preservation for some.
- Q51 · D** FOLFOX first with chemoradiation only for poor response was non-inferior for disease-free survival in intermediate-risk, upper and mid rectal cancers.
- Q52 · B** These are features of a clinical complete response. Watch-and-wait with MRI and endoscopy every 3–4 months is evidence-based; about a quarter regrow, mostly within 2 years, and most are salvageable.
- Q53 · D** Enlarged lateral nodes (short axis ≥7 mm before treatment) predict lateral local recurrence despite chemoradiation and TME; a boost or lateral node dissection is considered.
- Q54 · B** LARS affects up to half of patients after low anastomoses; it is assessed with the LARS score and managed with diet, loperamide, pelvic floor therapy and transanal irrigation.
- Q55 · D** The overall survival gain was seen in left-sided RAS wild-type disease (median about 38 vs 34 months); right-sided tumours did not benefit.
- Q56 · A** RAS mutation excludes anti-EGFR antibodies; pMMR excludes first-line immunotherapy; sotorasib targets only G12C.
- Q57 · B** Pembrolizumab doubled median progression-free survival, with fewer severe adverse events; curves crossed early because some tumours progress quickly on immunotherapy.
- Q58 · C** Resectability depends on what remains: vascular inflow, outflow and biliary drainage, and enough volume (over 20% in a healthy liver, over 30% after chemotherapy-related injury). Number and bilobar distribution alone do not exclude surgery.
- Q59 · B** Upfront primary resection did not improve survival; resect, stent or divert only for symptoms.
- Q60 · D** Adding bevacizumab to trifluridine–tipiracil improved median overall survival (about 10.8 vs 7.5 months).
- Q61 · B** Resistant RAS-mutant clones decay without anti-EGFR pressure; ctDNA selection identifies patients likely to respond to rechallenge.
- Q62 · C** Young age with MSH2 loss strongly suggests Lynch syndrome. MLH1 loss with BRAF V600E in an older patient is usually sporadic.
- Q63 · C** Signet-ring histology (more than 50% signet-ring cells) is associated with young age, peritoneal and nodal spread and worse survival; it should also prompt exclusion of a gastric primary.
- Q64 · D** Persistent, function-limiting neuropathy is an indication to stop oxaliplatin; completing the fluoropyrimidine preserves most of the benefit and reduces permanent neuropathy.
- Q65 · A** Over 3 years, the supported exercise programme improved 5-year disease-free survival (about 80% vs 74%) and overall survival — evidence that exercise is part of treatment.
- Q66 · A** ATOMIC showed that adding atezolizumab to FOLFOX roughly halved the risk of recurrence or death (disease-free survival) in stage III dMMR colon cancer; atezolizumab continued alone to 12 months. Germline testing is also needed.
- Q67 · E** NICHE-2 reported major pathological response in 95% and complete response in about two-thirds after brief neoadjuvant immunotherapy; dMMR tumours respond poorly to neoadjuvant FOLFOX.
- Q68 · D** In dMMR locally advanced rectal cancer, PD-1 blockade alone produced clinical complete responses in all of the first patients treated, allowing omission of radiation and surgery. Germline testing for Lynch follows.
- Q69 · C** RAPIDO reduced disease-related treatment failure and doubled pCR, but longer follow-up showed more locoregional failures, often linked to breached mesorectum at surgery — a reason for careful surgical quality and follow-up.

- Q70 · C** In OPRA, consolidation chemotherapy after chemoradiation gave higher TME-free survival (about 53% vs 41% at 3 years) than induction chemotherapy before chemoradiation; the longer interval from radiation allows more regression.
- Q71 · A** The 2-year cumulative regrowth was about 25%, concentrated in the first 2 years — hence surveillance every 3–4 months then. Most regrowths are salvageable by surgery.
- Q72 · E** Upper rectal, early T3 tumours with a clear margin and no EMVI have a low risk of local recurrence with good TME surgery; many guidelines allow surgery alone.
- Q73 · C** About 15% vs 28% received chemotherapy; 2-year recurrence-free survival was similar (about 93% vs 92%).
- Q74 · B** QUASAR showed a small absolute benefit. High-risk features (T4, fewer than 12 nodes, obstruction/perforation, LVI/PNI, close margins, poor differentiation in pMMR) shift the balance.
- Q75 · D** BREAKWATER roughly doubled median overall survival (about 30 vs 15 months) with the triplet. BRAF inhibitor monotherapy is ineffective in colorectal cancer because of feedback EGFR activation.
- Q76 · A** Colon epithelial cells express EGFR; BRAF blockade relieves negative feedback and EGFR reactivates the pathway, so an anti-EGFR antibody is combined.
- Q77 · E** KRAS G12C inhibitors alone have modest activity in colorectal cancer; combining with an anti-EGFR antibody improved progression-free survival over trifluridine–tipiracil or regorafenib.
- Q78 · E** MOUNTAINEER showed durable responses with tucatinib plus trastuzumab; trastuzumab deruxtecan is another option. HER2 amplification predicts resistance to anti-EGFR antibodies.
- Q79 · D** The combination was superior to chemotherapy (HR about 0.21) and to nivolumab monotherapy (HR about 0.62) for progression-free survival, at the cost of more immune toxicity.
- Q80 · C** Early apparent progression with clinical improvement can be pseudoprogression; confirm with repeat imaging before abandoning a potentially durable treatment. Also confirm MSI status if doubt exists.
- Q81 · D** Anti-VEGF agents increase the risk of perforation in stented patients; many teams avoid bevacizumab with an uncovered colonic stent.
- Q82 · C** Three-year progression-free survival improved by about 8 percentage points in eligible, resected patients; long-term overall survival did not differ significantly.
- Q83 · A** Median overall survival was about 41 months in both arms; the benefit comes from complete cytoreduction in selected patients, done in expert centres.
- Q84 · A** In highly selected patients with liver-only disease responding to chemotherapy, 5-year survival was about 57% vs 13% (intention to treat). Organ availability and selection limit its use.
- Q85 · B** In fit patients, the triplet with bevacizumab raised response and resection rates (TRIBE). Anti-EGFR antibodies are excluded by RAS mutation.
- Q86 · C** About 5–10% of MSI-high tumours retain staining because missense variants preserve the epitope. Discordance warrants repeat or NGS-based testing and genetic counselling if suspicion persists.
- Q87 · E** Double somatic hits explain many “unexplained” dMMR cancers; tumour MMR sequencing clarifies. Until resolved, relatives are managed by family history and counselling.
- Q88 · B** Lymphovascular invasion, poor differentiation, high tumour budding, piecemeal removal or a margin under 1 mm (deep submucosal invasion in sessile lesions) raise nodal risk enough to recommend resection.
- Q89 · E** More intensive testing did not translate into better survival. Guidelines therefore use moderate schedules focused on the first 3–5 years.
- Q90 · E** The protective effect emerged after several years; aspirin is discussed with Lynch carriers, weighing bleeding risk.
- Q91 · D** Chemotherapy with bevacizumab improved survival over chemotherapy alone in older trials, and CALGB/SWOG 80405 showed similar overall survival with bevacizumab or cetuximab in the full population. Chemotherapy alone remains a valid option.
- Q92 · B** MUTYH polyposis is recessive: it needs two pathogenic variants. Single-allele carriers (1–2% of people) have little or no excess risk and are usually screened as the general population (some guidelines treat them like people with an affected first-degree relative — here her sister is affected, which may itself justify earlier colonoscopy).

Q93 · E PSC roughly triples colorectal neoplasia risk over IBD alone, and cancers are often right-sided and arise earlier. Colonoscopy at PSC diagnosis and yearly thereafter is recommended; ursodeoxycholic acid is not chemopreventive (high doses may even be harmful).

Q94 · E MLH1 and MSH2 carriers have the highest colorectal risk: colonoscopy every 1–2 years from 20–25. MSH6 and PMS2 carriers may start at 30–35 with 1–3-yearly intervals. Upper endoscopy starts at 30–35.

Q95 · D After segmental resection, MLH1/MSH2 carriers have a metachronous colon cancer risk of up to about 20% at 10 years. Total colectomy with ileorectal anastomosis reduces this, at some cost to bowel function; age, function and preference decide. Yearly endoscopy of the remaining rectum continues.

Q96 · E In ALASCCA, low-dose aspirin started after surgery and continued for 3 years reduced recurrence in PI3K-pathway-altered stage I–III colorectal cancer. Celecoxib benefited a PIK3CA-mutant subgroup of CALGB/SWOG 80702, but aspirin is preferred for safety. In unselected patients aspirin trials were negative.

Q97 · B It is reasonable to test and replete vitamin D below 20 ng/mL, chiefly for bone health; a meta-analysis of trials suggests a possible benefit, but causality is unproven.

Q98 · A A healthy liver needs a future liver remnant above about 20%; after chemotherapy-associated liver injury, above about 30%. Portal vein embolisation can grow the remnant.

Q99 · B Lesions under 2 cm and more than 1 cm deep are most likely to "vanish" radiologically, but complete pathological response is rare. Marking them allows resection of the site later.

Q100 · A Thermal ablation (radiofrequency or microwave) was non-inferior for overall survival with fewer complications. Long-term data are awaited, and the choice is made in a multidisciplinary meeting.

Q101 · C Relapse within 12 months of adjuvant oxaliplatin suggests resistance and residual neuropathy, so an irinotecan-based backbone is preferred. RAS mutation excludes anti-EGFR antibodies.

Q102 · C Tucatinib-trastuzumab data are in RAS wild-type disease; for HER2-positive RAS-mutant cancers trastuzumab deruxtecan is suggested (DESTINY-CRC02). Anti-EGFR and G12C-directed drugs do not apply; pMMR tumours do not respond to PD-1 blockade.

Q103 · A POLE/POLD1 proofreading defects produce ultramutated tumours that respond to immune checkpoint inhibitors despite being pMMR. Germline testing for polymerase proofreading-associated polyposis is also appropriate in a young patient.