Oncology
Master Class
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Question 1

Risk factors for gastric cancer include all of the following except:

A) Obesity
B) ETOH
C) Low fibre diet
D) Smoking
E) Helicobacter infection
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Question 2

Which of the following is NOT CORRECT

Tobacco use:

A) Accounts for approximately 21% of cancer related deaths world wide

B) Is an important risk factors for breast cancer

C) Is the strongest risk factor for lung cancer: increasing risk 10-20X

D) Is a risk factor for all of the following cancers: leukaemia, oral cavity, pancreas, liver, stomach, cervix, kidney, large bowel and bladder

E) Accounts for 30% cancer deaths in USA
Which of the following is NOT CORRECT

Tobacco use:

A) Accounts for 21% of cancer related deaths world wide
B) Is one of the strongest risk factors for breast cancer
C) Is the strongest risk factor for lung cancer: increasing risk 10-20X
D) Is a risk factor for all of the following cancers: Leukaemia, oral cavity, pancreas, liver, stomach, cervix, kidney, large bowel and bladder
E) Accounts for 30% cancer deaths in USA
Question 3

59 year old women presents to LMO for health check

• PHX: None significant
• FHX: Grandmother breast cancer age 80
• Systems review: NAD
• Physical exam: NAD
• Referred for screening MMG
Next step?
• Core BX: IDC (Invasive ductal carcinoma)
Next step?
• WLE and SLN:
  – 1.2 cm IDC
  – LN 0/2 involved
Question 4

Which of the following is most helpful in directing the approach to management of this patient?

A) ALND
B) Genetic testing for BRCA 1/2 mutation
C) IHC for ER/ PR
D) Staging, preferably whole body PET scan
A) ALND
B) Genetic testing for BRCA1/2 mutation
C) IHC for ER/PR
D) Staging, preferably whole body PET scan
• This patient has ESBC (T1N0MX, stage 1)
• Hormone receptors tested in all breast cancer
• Endocrine therapy only beneficial in HR+ tumours
• Further imaging is not required unless patient has symptoms or high risk disease
• Sentinel node neg therefore further lymph node involvement unlikely → no ALND required
• Genetic testing for BRCA only in high risk patients (strong family history, young patient, triple negative tumour)
Question 5

• Which of the following chemotherapeutic/targeted agents is NOT associated with the toxicity listed?

A) Bleomycin: Pulmonary toxicity
B) Bevacizumab (VEGF a/b): Hypertension
C) Tamoxifen: Osteoporosis
D) Capecitabine: Rash
Which of the following chemotherapeutic/targeted agent is NOT associated with the toxicity listed?

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Question 6

• With regard to tumour markers which of the following is incorrect?

a) Elevated AFP is associated with liver and germ cell tumours
b) Elevated CA15-3 and CA27-29 is associated with NSCLC
c) Elevated CA19-9 is associated with pancreatic, gall bladder, bile duct and gastric tumours
d) Elevated CEA is associated with CRC
e) Elevated CA125 is associated with Ovarian Cancer
Question 6

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Question 7

• A 64 year old man is evaluated for a 3-month hx of pain in left shoulder, radiating down medial arm to hand.

• Systems review: chronic cough

• PHx: 40 pack year smoking history.

• OE:
  – Shoulder not tender, complete range of movement
  – Neurological exam: Constricted right pupil and ptosis.
  – Some weakness and atrophy of intrinsic muscles of hand
• Which of the following is the most appropriate next diagnostic test?

A) CT chest
B) Electromyography
C) CT/ MRI brain
D) CT/ MRI c- spine
E) CT/ MRI shoulder
Which of the following is the most appropriate next diagnostic test?

A) CT chest
B) Electromyography
C) CT/ MRI brain
D) CT/ MRI c-spine
E) CT/ MRI shoulder
• Likely a pancoast tumour:
  – Brachial plexus involvement:
    • Radiating shoulder pain
    • Neurological abnormalities
  – Damage to sympathetic nerves:
    • Horner's syndrome: unilateral constricted pupil, facial dryness and ptosis.

• CT chest likely to reveal apical mass with bone destruction
Question 8

• A 55 year old man presents to ED due to mid back pain
• Started 3 weeks ago, gradually increasing
• Medical HX:
  – Metastatic prostate cancer: on zoledronic acid (bisphosphonate) and hormone therapy
What next?
• OE:
  – Lower limbs diffusely weak.
  – Brisk reflexes (up going plantar).
  – Reduced pinprick sensation from nipple down
What Next?
• Dexamethasone given
• Urgent MRI:
  – Spinal cord compression the level 4th thoracic vertebrae
• Best MX:
• Best MX:

A) Cease hormone therapy and commence chemotherapy (taxane)
B) Neurosurgical review for consideration of surgical decompression
C) Radiation oncology review for consideration of radiotherapy
D) Change to second line hormone therapy
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B) **Neurosurgical review for consideration of surgical decompression**

C) Radiation oncology review for consideration of radiotherapy

D) Change to second line hormone therapy
Spinal cord compression

- Likely Spinal cord compression due to bone metastases from recurrent prostate cancer
- Most common malignancies: prostate, breast and lung
- Thoracic spine is most common site
- Initial symptoms:
  - Back pain: often first
  - Neurological symptoms: weakness, numbness, sphincter disturbance
- Oncological emergency
- MRI required to confirm dx and for treatment planning
• Neuro surg opinion ? urgent anterior surgical decompression of spinal cord

• Surgery c/w radiotherapy associated with better ambulatory outcomes
  – highly radiosensitive tumours eg leukaemia, lymphoma, myeloma and germ cell tumour excluded from this study
Question 8

- A 67 year old man has a hx of stage III colon cancer
- Fit and well with no other medical history
- Annual blood/ CT scan after 3 years
• FBE: normal
• LFT: normal
• CEA: 68
Solitary liver metastasis
• Increased CEA and solitary liver metastasis
• Most appropriate initial management:
  A) Chemoembolization
  B) Chemotherapy
  C) Enthanol ablation
  D) Radiofrequency ablation
  E) Surgical resection
• Most appropriate initial management:
A) Chemoembolization
B) Chemotherapy
C) Ethanol ablation
D) Radiofrequency ablation
E) Surgical resection
• Solitary liver metastasis in colon cancer potentially curable
  – Surgical resection results in cure in about 25% of patients
• Contraindications for surgery include:
  – large tumours
  – unfavourable anatomic location
  – multiple tumours
  – poor hepatic function
  – poor performance state
• If not immediately amenable to surgery “neo-adjuvant chemotherapy” may convert to surgical candidate.
Question 9

Infections are thought to be directly involved in the development of 17% of cancers worldwide. Which of the following viruses is not associated with the development of the corresponding malignancy

a) HPV → cervical, anogenital, SCC head and neck
b) HEP B and C → Hepatocellular cancer
c) HIV → Kaposi sarcoma, primary effusion lymphoma
d) Human T-cell lymphotrophic virus (HTLV-1) → adult T cell lymphoma
e) EBV → Small cell lung cancer
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e) EBV $\rightarrow$ Small cell lung cancer

EBV is associated with Burkitt lymphoma
Question 10

• A 72 year old woman presents with:
  – 3 week HX R arm pain, L leg pain

• Past history:
  – 7 years ago: Node + breast cancer
  – Surgery, radiotherapy, chemo and 5yrs tamoxifen.

• OE:
  – Bone tenderness
  – Scar from surgery
  – Otherwise NAD
• Bone scan: Increased uptake in multiple thoracic vertebrae, ribs, right humerus and left femur
• Biopsy bone lesion:
  – Adenocarcinoma consistent with breast primary
  – ER+, PR+, HER-2 negative
• Most appropriate systemic management
  a) Hormone therapy, bisphosphonate therapy and analgesia
  b) Chemotherapy and analgesia
  c) Chemotherapy, analgesia and bisphosphonate therapy
  d) Bisphosphonate therapy and analgesia
• Most appropriate management
  a) Hormone therapy, bisphosphonate therapy and analgesia
  b) Chemotherapy and analgesia
  c) Chemotherapy, analgesia and bisphosphonate therapy
  d) Bisphosphonate therapy and analgesia
• Initial Mx of Pt with HR+ MBC is usually endocrine therapy
  – Includes AI, tamoxifen
• Patients with bone mets hormone therapy is usually combined with bisphosphonate
  – Reduces skeletal complications: pain, fracture, analgesic use
• Chemotherapy is considered in patients who have a high burden of tumour in vital organs or who have HR negative disease.
Question 11

- A 45 year old man receiving adjuvant chemotherapy for colon cancer presents to ED with a temperature of 38 degrees.
What next?
• Otherwise feeling well. No symptoms to suggest source of infection.
• BP 140/80. HR 80. RR 16. Temp 38.5
• Hb: 119, WBC: 2 neut: 0.5, Plt: 140
• In addition to admitting patient, undertaking a septic work up and closely observing you should:
• A) Delay commencement of antibiotics until source of infection clear
• B) Commence empirical broad spectrum antibiotics
• C) Administer growth factors
• D) Insert Central line and IDC, commence empirical broad spectrum antibiotics and antifungals and transfer directly to ICU
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Management of febrile neutropenia

• Mortality from FN has diminished steadily but remains significant.
• Overall mortality rates are between ~5% (solid tumours) and 11% (some haem malignancies).
• Initial assessment and investigation
  1) Note presence of indwelling i.v. catheter
  2) Symptoms or signs suggesting an infection focus:
     - Respiratory
     - GI
     - Skin
     - Perineal/ GU
     - Oropharynx
     - CNS
  3) IX:
     - FBE, U+E, LFT, CRP, Blood cultures X2 (including from IV if present), MSU.
     - If relevant stool MCS, sputum, bx skin lesion, CXR
• Early commencement of broad spectrum antibiotics including adequate gram negative cover crucial

• Some studies looking at oral antibiotics in selected populations
Question 12

- A 62 year old man is evaluated in ED:
  - wt loss
  - cough
  - progressive dyspnoea
  - head fullness
  - difficulty swallowing for 3 months
  - 2 days of progressive facial swelling

- PHX: 45 pack year smoking history
On Examination

Pulse 120, BP 100/50, RR20

- Odematous face, venous distension on neck and chest wall
- Normal heart sounds.
- Faint expiratory wheeze.
- No hepatomegaly or peripheral odema

CXR: mediastinal widening and small, bilateral pleural effusions
Which of the following is the most likely dx?

a) Heart failure
b) Pneumonia
c) PE
d) Superior vena cava syndrome
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SVC syndrome

- Caused by gradual compression of the SVC
- Most common cause: lung cancer
- Typically insidious onset
- Symptoms:
  - Dyspnoea is most common
  - Others: cough, upper extremity swelling, chest pain, dysphagia (oesophageal compression)
- Signs:
  - Venous distension in neck and chest wall, facial oedema, plethora, cyanosis
- Radiological findings
  - Mediastinal widening (2/3 patients), pleural effusion (1/4 patients)
- CT is most useful test to diagnose SVC obstruction and to detect a mediastinal mass.
A 70 year old man presents with 3 month history cough, dyspnoea and 10kg weight loss.
Otherwise well, keen for “best treatment available”
Ex smoker.
CT C/A/P: right hilar mass, left adrenal mass and multiple liver lesions
Bronchoscopy/ Bx: small cell lung cancer
• Most appropriate management
   a) Best supportive care
   b) Chemotherapy and radiotherapy
   c) Surgery, chemotherapy and radiotherapy
   d) Chemotherapy
• Most appropriate management
  a) Best supportive care
  b) Chemotherapy and radiotherapy
  c) Surgery, chemotherapy and radiotherapy
  d) Chemotherapy
SCLC

- Occult or overt metastases are common
- Staging: extensive Vs limited stage disease
- Extensive stage:
  - disease beyond confines of a radiation port
  - 70% of patients
  - Treated with chemotherapy
- Highly responsive to chemotherapy:
  - 60-80% respond
  - Prolongs survival
- Palliative benefits from chemo may occur even in patients with poor performance state, weight loss and severe organ dysfunction
A 36 year old women post mastectomy for invasive ductal carcinoma.

- Tumor is 3cm with 6 positive LN in axilla.
- ER negative, PR negative, HER-2 over-expressed
- Phx/ Fhx: none relevant
- In addition to adjuvant chemotherapy and radiotherapy she should receive

A) Anastrazole (aromatase inhibitor)
B) Bevacizumab (VEGF antibody)
C) Trastuzumab (HER-2 antibody)
D) Zoledronic acid (bisphosphonate)
A) Anastrazole
B) Bevacizumab
C) Trastuzumab
D) Zoledronic acid
• Patient has high risk breast cancer:
  – LN positive, HER-2 positive
• HER-2 amplification is tested on all primary tumours
• Adjuvant trastuzumab for 52 weeks, in patients with HER-2 over expression:
  – Reduces recurrence by 50%
  – Mortality by up to 30%
• Most serious toxicity is reduction in LV function:
  – Assessed prior to, and during therapy
Question 15

• 43 year old man presents to ED:
  – Acute R-sided abdo pain, nausea and vomiting.
  – CT: inflamed area in R lower abdo quadrant.

• Pt undergoes urgent appendectomy.

• Found to have an obstructing lesion in caecum
  – Histopathology:
    • High grade colon cancer.
    • 5/ 10 lymph nodes + for metastatic cancer.
    • T3N2 (stage III) colon cancer

• Colonoscopy and CT C/A/P: no other lesions
• Most appropriate post operative management
  a) Close observation
  b) Chemotherapy and radiotherapy
  c) Chemotherapy
  d) Radiotherapy
• Most appropriate post operative management
  a) Close observation
  b) Chemotherapy and radiotherapy
  c) Chemotherapy
  d) Radiotherapy
• Chemotherapy improves survival in stage III colon cancer
• No role for adjuvant local radiation in colon cancer.
  – It is useful in some rectal cancer
Question 16

• An 82 year old man referred by LMO due to a elevated PSA of 6.
• GU systems review normal.
• No bone pain, weight loss or change in general health.
• PHX: IHD: prior bypass, HT, T2DM
• Most appropriate next step?
  a) Bone scan
  b) Repeat PSA
  c) Transrectal prostate biopsy
  d) Observation
a) Bone scan
b) Repeat PSA
c) Transrectal prostate biopsy
d) Observation
PSA Screening

• Result in detection of cancer:
  – benefit of this detection not clear

• >75 years: benefit of treating screen detected prostate cancer are small to none

• Are moderate to substantial harms:
  – erectile dysfunction, urinary incontinence, bowel dysfunction, death, pain, psychological.

• Especially with comorbidities, watchful waiting is most appropriate management
Question 13

• A 19 year old med student
  – 3 week history of a swollen left testicle.
• Plays footy regularly but can’t recall a recent injury
• Sexually active with one female partner and usually uses condoms
• OE:
  – Minimally swollen left testicle.
  – No penile discharge
• IX:
  – LDH, Alpha-fetoprotein, Beta HCG: all elevated
  – Ultrasound: 5cm mass on left testicle
• The most likely diagnosis is
  a) Neisseria gonorrhoea infection
  b) Nonseminoma
  c) Seminoma
  d) Testicular torsion
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a) Neisseria gonorrhoea infection
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d) Testicular torsion
Testicular cancer

- Ultrasound suggestive of neoplasm
- When ddx includes testicular cancer measure serum tumour markers:
  - Including AFP and beta-HCG
- Beta-HCG:
  - Can be elevated in seminomatous or non-seminomatous tumours
- AFP:
  - Increased only in non-seminomatous tumours
- Germ cell malignancies (seminomas and non-seminomas) are most common solid tumours in men 15-34
- Highly curable
Question 17

- With regard to tumour markers which of the following is incorrect?
- A) CEA is a useful investigation in follow up for patients who have completed adjuvant treatment for CRC
- B) After detecting a rise in CA15-3 (with no symptoms or imaging changes suggestive of recurrence) in a patient with MBC systemic therapy should be changed
- C) Tumour markers are rarely useful without a confirmed cancer diagnosis
- D) Tumour markers should not be requested in the emergency department
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Question 18

• With regard to palliative care:
  • 1) Palliative care clinicians are only involved in cancer patients when chemotherapy has no further role
  • 2) Early palliative care referral can prolong survival
  • 3) Referral to palliative care occurs when survival is predicted to be <3 months
Question 18

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Question 19

- 64 year old seen in clinic 5 months post dx limited stage small cell lung cancer
- He has completed 4 cycles of chemotherapy with concurrent RT
- Excellent response on CT with only scar tissue seen.
- Pt has excellent performance status and no other medical problems.
- Exam: unremarkable
Which of the following is the most appropriate next step in MX?

a) Maintenance chemotherapy

b) Prophylactic cranial irradiation

c) Surgery: Right upper lobectomy and mediastinal LN dissection

d) Close observation
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a) Maintenance chemotherapy
b) Prophylactic cranial irradiation
c) Surgery: Right upper lobectomy and mediastinal LN dissection
d) Close observation
• Brain metastases dx in 10-14% of patients with SCLC at dx and >50% during course of illness
• Brain is frequent site of first relapse if patients get CR to treatment
• Prophylactic irradiation is therefore considered
• Meta-analysis (mostly included pt with limited small cell):
  – Reduction in CNS relapse and improved long term survival
• Adjuvant
• Neo-adjuvant
• Curative Vs Palliative treatment
• Palliative care
• Febrile neutropaenia
• Spinal cord compression
• Hypercalcaemia
• Tumour lysis
• Cardiac tamponade
• Add slide on paraneoplastic syndromes as per discussion with 2013 students
Thank you