一、單選題（15 題，每題各 2 分）　　　　※ 注意：請於試卷內之「選擇題作答區」依序作答。

1. Pregnant women often use antidepressants, despite limited available information regarding individual antidepressants and specific birth defect risks. Which one had the greatest proportion of elevated birth defect risks?
   (A) Venlafaxine
   (B) Escitalopram
   (C) Fluoxetine
   (D) Paroxetine

2. After kidney transplant, which of the following immunosuppressive therapies should be avoided during pregnancy and discontinued at least 6 weeks before pregnancy?
   (A) Azathioprine
   (B) Mycophenolate mofetil
   (C) Cyclosporine
   (D) Sirolimus

3. You are a member of the healthcare team seeing a 74-year-old woman with a number of medical conditions and a medication list including 14 drugs. She complains of dizziness. Which of the following drugs is considered to have strong anticholinergic effects?
   (A) Oxybutynin
   (B) citalopram
   (C) loratadine
   (D) loperamide

4. You are a member of the health care team for a 57-year-old woman in whom hormone replacement therapy (HRT) is being considered for postmenopausal symptoms. Which one of the following statements is **correct**?
   (A) Long-term systemic HRT use is linked to increased breast cancer risks. These risks could be eliminated completely after HRT discontinuation.
   (B) Risk varied among HRT types, with higher risks for combination estrogen-progestogen treatments and longer duration of use.
   (C) Adjustment for personal characteristics, smoking, alcohol intake, comorbidities, family history, and other prescribed drugs abolished the observed associations.
   (D) Increased risk for combined progestogens was highest for dydrogesterone and lowest for norethisterone

5. You are a member of the healthcare team seeing a 70-year-old man with newly-diagnosed AF. The patient is worried about his risk of bleeding with anticoagulation, and he asks for a dose of the new oral anticoagulants (NOACs) less than the recommended dose. Which of the following outcomes was associated with underdosing of NOACs vs standard dosing?
   (A) Higher risk for stroke or systemic embolism
   (B) Higher risk for mortality
   (C) No difference in the risk of major bleeding
   (D) Lower risk for CV events

6. Which treatment strategy does the "2020 American College of Rheumatology Guideline for the Management of Gout" recommend for patients taking urate-lowering therapy (ULT) for their gout?
   (A) Treat-to-target with a target of serum uric acid (UA) level < 8 mg/dL
   (B) Treat-to-target with a target of serum UA level < 6 mg/dL
   (C) Treat with a fixed standard-dose ULT strategy for up to 12 months
   (D) Treat with a fixed standard-dose ULT strategy for up to 6 months

7. Tom is a 53-year-old man who recently presented with painful subcutaneous tophi on his left first metatarsophalangeal joint and his right wrist. The patient had previously been diagnosed with acute gouty arthritis approximately 2 years ago but had not experienced an acute attack since his original diagnosis. He reports that he had experienced similar symptoms with his last flare, which lasted 4 to 5 days, and was treated in urgent care. He is currently taking prednisone to treat his gout flare. Tom was also diagnosed with stage 3 chronic kidney disease 2 years ago. According to the 2020 American College of Rheumatology Guideline for gout management, which of the following treatments is best for Tom?
   (A) Start low-dose allopurinol
   (B) Start probenecid
   (C) Start high-dose allopurinol
   (D) Start pegloticase

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8. Which of the following best describes the response rate for monotherapy with programmed cell death protein 1 /programmed death-ligand 1 inhibitors?
(A) It varies by tumor type, but is never more than 10%
(B) It varies by tumor type, but is usually around 10% to 25%
(C) It varies by tumor type, but is usually around 40% to 50%
(D) It is typically around 50% to 60%

9. You are a member of the healthcare team seeing a 60-year-old man with a 1-hour history of left chest pain radiating to his jaw. He developed a "bad cold" 3 days ago. Which of the following pathogens was associated with a higher risk for acute myocardial infarction (AMI)?
(A) Only influenza A was associated with a higher risk for AMI
(B) Only influenza A and B were associated with a higher risk for AMI
(C) Only respiratory syncytial virus was associated with a higher risk for AMI
(D) Infection with any respiratory virus was associated with a higher risk for AMI

10. The patient is diagnosed with an AMI as well as coronavirus disease 2019 (COVID-19). What is the potential relationship between COVID-19 and myocardial injury?
A) Nearly 20% of patients admitted with COVID-19 had elevated serum troponin levels.
B) Most patients with evidence of myocardial injury had normal transthoracic echocardiography (TTE) findings.
C) Any myocardial injury was associated with a higher risk for mortality.
D) Only myocardial injury with abnormal findings on TTE was associated with a higher risk for mortality.

11. Published guidelines exist for management of care following an AMI to promote secondary prevention and to minimize the risk of developing HF. Which of the following is **incorrect**?
(A) Nearly 22% percentage of patients who experienced an AMI went on to develop heart failure (HF).
(B) The pattern of BNP dynamic change within the first week of the MI event is monophasic and increases linearly.
(C) Drugs that help to minimize the risk of HF include beta-blockers (BBs), angiotensin converting-enzyme (ACE) inhibitors, angiotensin receptor blockers (ARBs), and mineralocorticoid receptor antagonists (MRAs). The utilization of BBs, ARBs, and ACE-inhibitors post-MI is good, while the use of MRAs is marginal.
(D) Evidence from the European Society of Cardiology (ESC) Heart Failure Long Term Registry showed that reaching target doses has been better achieved in ACE inhibitors and MRAs.

12. Catherine is a 72-year-old female has a 20-minute episode of difficulty expressing herself, right arm and hand weakness. You have the following information:
(1) Past medical history: HTN, CAD, dyslipidemia.
(2) Medications: clopidogrel 75 mg qd, amlodipine 5 mg qd, irbesartan 150 mg/HCTZ 12.5 mg qd.
(3) BP: 132/82 mmHg, LDL 103 mg/dL
(4) MRI: small diffusion-weighted imaging lesion in the left frontal cortex, 3 small microbleeds in the basal ganglia, mild periventricular hyperintensities
(5) MRA: 30% left internal carotid artery origin stenosis
If you are considering adjusting medications, which of the following is **incorrect**?
(A) Check for heart rhythm to ensure that there is no concomitant or paroxysmal AF.
(B) If no AF, patient should be treated with DAPT immediately. Clopidogrel plus aspirin is indicated.
(C) Clopidogrel has less efficacy in CYP3A4 loss-of-function carriers than non-carriers.
(D) In this patient with a 30% left internal carotid artery origin stenosis, ticagrelor-aspirin is also a good choice.

13. Several meta-analyses have evaluated the impact of rapid diagnostic modalities for bloodstream infections. Investigators found a decrease in mortality when rapid diagnostic testing was used in concert with which of the following?
(A) Longer duration of antibiotic therapy
(B) Increased antibiotic dose
(C) Antibiotic stewardship intervention
(D) Confirmed phenotypic susceptibility results

14. You are a member of the healthcare team seeing a 64-year-old man who experienced his first MI 3 months ago. He complains of increasing pain from left hip osteoarthritis, and his current regimen of acetaminophen plus physical therapy is insufficient. You consider prescribing him an NSAID. What should you bear in mind regarding the CV and GI side effects?
(A) Naproxen was associated with a lower risk for CV events compared with celecoxib
(B) Naproxen was associated with a lower risk for CV events compared with ibuprofen
(C) Celecoxib was associated with a lower risk for GI events compared with naproxen and ibuprofen
(D) Naproxen was associated with a lower risk for GI events compared with ibuprofen

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15. Following the previous question, you decide to prescribe an NSAID to help this patient's pain. Which NSAID is least likely to promote CV and bleeding events?
(A) Meloxicam
(B) Ibuprofen
(C) Naproxen
(D) Diclofenac

二、配合題：請將下列藥品相對應的法定適應症之代碼，標明題號作答於試卷內之「非選擇題作答區」。答案可能不只一個，可重複選擇。(10 分)

題號	藥品
1.	apomorphine
2.	aripiprazole
3.	crizotinib
4.	dronedarone
5.	edoxaban
6.	midazolam
7.	prasugrel
8.	sumatriptan
9.	teriparatide
10.	topiramate

適應症
A. Acute coronary syndrome
B. Atrial fibrillation
C. Bipolar disorder
D. Chronic obstructive pulmonary disease
E. Chronic pain
F. Deep venous thrombosis
G. HIV infection
H. Hypercalcemia of malignancy
I. Invasive candidiasis
J. Migraine
K. Non-small cell lung cancer
L. Osteoporosis
M. Primary hypercholesterolemia
N. Parkinson's disease
O. Rheumatic arthritis
P. Schizophrenia
Q. Seizure
R. Transplant rejection
S. Type 2 diabetes
T. Ulcerative colitis

三、問答題：慢性疼痛的治療除了可使用鴉片類藥品外，也可加上輔助性治療藥品。（共 20 分）
　（一）請簡述哪些藥品（不含外用製劑）可作為慢性疼痛的輔助性治療，請說明其藥理類別，並各類至少列舉一藥品學名。（10 分）
　（二）請說明加上輔助性治療藥品之目的，及不同種類藥品在選用上的考量。（10 分）

見背面

四、問答題：閱讀以下文章摘要並回答問題。（共 25 分）

> **Efficacy and Safety of the mRNA-1273 SARS-CoV-2 Vaccine**
>
> by COVE Study Group.
>
> N ENGL J MED published on December 30, 2020. DOI: 10.1056/NEJMOA2035389.
>
> **BACKGROUND**
>
> Vaccines are needed to prevent coronavirus disease 2019 (Covid-19) and to protect persons who are at high risk for complications. ① <u>The mRNA-1273 vaccine is a lipid nanoparticle– encapsulated mRNA-based vaccine that encodes the prefusion stabilized full-length spike protein of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), the virus that causes Covid-19.</u>
>
> **METHODS**
>
> This phase 3 randomized, observer-blinded, placebo-controlled trial was conducted at 99 centers across the United States. ② <u>Persons at high risk for SARS-CoV-2 infection or its complications were randomly assigned in a 1:1 ratio to receive two intramuscular injections of mRNA-1273 (100 µg) or placebo 28 days apart.</u> The primary end point was prevention of Covid-19 illness with onset at least 14 days after the second injection in participants who had not previously been infected with SARS-CoV-2.
>
> **RESULTS**
>
> The trial enrolled 30,420 volunteers who were randomly assigned in a 1:1 ratio to receive either vaccine or placebo (15,210 participants in each group). More than 96% of participants received both injections, and 2.2% had evidence (serologic, virologic, or both) of SARS-CoV-2 infection at baseline. Symptomatic Covid-19 illness was confirmed in 185 participants in the placebo group (56.5 per 1000 person-years; 95% confidence interval [CI], 48.7 to 65.3) and in 11 participants in the mRNA-1273 group (3.3 per 1000 person-years; 95% CI, 1.7 to 6.0); vaccine efficacy was 94.1% (95% CI, 89.3 to 96.8%; P<0.001). ③ <u>Efficacy was similar across key secondary analyses, including assessment 14 days after the first dose, analyses that included participants who had evidence of SARS-CoV-2 infection at baseline, and analyses in participants 65 years of age or older.</u> Severe Covid-19 occurred in 30 participants, with one fatality; all 30 were in the placebo group. ④ <u>Moderate, transient reactogenicity after vaccination occurred more frequently in the mRNA-1273 group.</u> Serious adverse events were rare, and the incidence was similar in the two groups.
>
> **CONCLUSIONS:**
>
> The mRNA-1273 vaccine showed 94.1% efficacy at preventing Covid-19 illness, including severe disease. ⑤ <u>Aside from transient local and systemic reactions, no safety concerns were identified.</u> (Funded by the Biomedical Advanced Research and Development Authority and the National Institute of Allergy and Infectious Diseases; COVE ClinicalTrials.gov number, NCT04470427.)

(1) Translate the underlined sentences (marked with ①②③④⑤ in front of the sentences) into Chinese. (16 points)

(2) What were the percentages of volunteers diagnosed severe Covid-19 in each group? Please list your calculation. (2 points)

(3) What were the percentages of volunteers deceased due to Covid-19 in each group? Please list your calculation. (2 points)

(4) The mRNA-1273 vaccine demonstrates a novel mechanism of action. Provide 1 example of each type of traditional vaccines, live-attenuated vaccines and inactivated vaccines, and their precautions or contraindications. (5 points)

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五、問答題：閱讀以下治療指引並回答問題。（共 15 分）

Pharmacologic Approaches to Glycemic Treatment of Type 2 Diabetes: Synopsis of the 2020 American Diabetes Association's Standards of Medical Care in Diabetes Clinical Guideline

Kacie Doyle-Delgado, James J. Chamberlain, Jay H. Shubrook, et al.

Ann Intern Med. 2020;173:813-821. doi:10.7326/M20-2470.

RECOMMENDATIONS

- Metformin is the preferred initial pharmacologic agent for the treatment of type 2 diabetes (Grade A recommendation).

① - <u>Early combination therapy can be considered in some patients at treatment initiation to extend the time to treatment failure</u> (Grade A recommendation).

② - <u>The early introduction of insulin should be considered if there is evidence of ongoing catabolism (weight loss), if symptoms of hyperglycemia are present, or when hemoglobin A1c (HbA1c) or blood glucose levels are very high</u> (HbA1c >10% [86 mmol/mol], blood glucose ≥16.7 mmol/L [300 mg/dL]) (Grade E recommendation).

- A patient-centered approach should be used to guide the choice of pharmacologic agents. Considerations include cardiovascular comorbid conditions, hypoglycemia risk, impact on weight, cost, risk for side effects, and patient preferences (Grade E recommendation).

- Among patients with type 2 diabetes who have established atherosclerotic cardiovascular disease (ASCVD) or indicators of high risk, established kidney disease, or heart failure, a sodium–glucose cotransporter-2 (SGLT2) inhibitor or glucagon-like peptide-1 receptor agonist (GLP-1 RA) with demonstrated cardiovascular disease benefit is recommended (Grade A recommendation).

- In patients with type 2 diabetes who need greater glucose lowering than can be obtained with oral agents, GLP-1 RAs are preferred to insulin when possible (Grade B recommendation).

③ - <u>The medication regimen and medication-taking behavior should be reevaluated at regular intervals (every 3 to 6 months) and adjusted as needed to incorporate specific factors that affect choice of treatment</u> (Grade E recommendation).

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(1) Translate the underlined sentences (marked with ①②③ in front of the sentences) into Chinese. (8 points)

(2) Explain the rationale for metformin being the preferred initial pharmacologic agent for the treatment of type 2 diabetes (T2DM) in terms of cardiovascular comorbid conditions, hypoglycemia risk, impact on weight, cost and risk for side effects, etc. (3 points)

(3) List one SGLT2 inhibitor and one GLP-1 RA with demonstrated cardiovascular benefit recommended for T2DM patients who have established ASCVD or indicators of high risk, established kidney disease or heart failure. (4 points)

試題隨卷繳回