A group of researchers conduct a study to evaluate the pharmacologic properties of oxfendazole, an anthelminthic agent. As part of the study, increasing oral doses of oxfendazole (0.5 to 60 mg/kg) are administered to healthy volunteers. Data is collected to form a pharmacokinetic profile of the drug and its metabolites, and the incidence of adverse effects is recorded for the various dosages. A total of 20 healthy male and female (nonchildbearing potential) volunteers participate in the study. Oxfendazole is found to be well tolerated throughout the dose range without any serious adverse effects or deaths. Which of the following best describes this type of study?

- A. Preclinical study
- B. Phase I clinical trial
- C. Phase II clinical trial
- D. Phase III clinical trial
- E. Phase IV clinical trial

Proceed To Next Item

Researchers studying the effects of hormone replacement therapy (HRT) on the risk of myocardial infarction (MI) among postmenopausal women calculate the relative risk (RR) of MI to be 1.30 ($p = 0.07$) among women who are taking HRT compared to those who are not. The researchers conclude that there is no statistically significant increased risk of MI with HRT (based on a cutoff of $\alpha = 0.05$). Subsequently, the results of a meta-analysis determine that there actually is an increased risk of MI, with an overall RR = 1.32 ($p = 0.03$) among postmenopausal women who are taking HRT compared to those who are not. Which of the following was the most likely problem in the first study?

- A. Berkson's bias
- B. Placebo effect
- C. Poor blinding
- D. Researcher expectancy
- E. Sample size

Proceed To Next Item

A new biomarker has been shown to allow for the early detection of non-small cell lung carcinoma. A preliminary analysis on a cohort study of this new test demonstrates that its use prolongs survival of lung cancer patients by 3 months when compared to the survival of patients diagnosed by conventional methods. A secondary analysis reveals no difference in 6-month mortality rates between the 2 groups. Which of the following factors most likely explains the study results?

- A. Confounding
- B. Lead-time bias
- C. Length-time bias
- D. Measurement bias
- E. Observer bias
- F. Rare disease assumption

Proceed To Next Item

A researcher is interested in studying whether there is an association between neural tube defects and use of acetaminophen during the first 3 months of pregnancy. He randomly chooses a group of women who have just delivered babies with neural tube defects, and a second group of women who delivered apparently healthy babies. These 2 groups were then asked about their use of acetaminophen during the first 3 months of pregnancy. Which of the following measures of association are the investigators most likely to report?

- A. Median survival
- B. Odds ratio
- C. Prevalence ratio
- D. Relative rate
- E. Relative risk

Proceed To Next Item

Researchers conduct a prospective study that demonstrates an association between alcohol consumption and transitional bladder carcinoma, with a relative risk (RR) of 1.81 and a p-value of 0.03. They then divide the study subjects into 2 groups, smokers and non-smokers, and again examine the association between alcohol consumption and bladder cancer:

	RR	P-value
Smokers	0.95	0.87
Non-smokers	1.03	0.96

The discrepancy between the overall results and the stratified results is best explained by which of the following?

- A. Confounding
- B. Effect modification
- C. Measurement bias
- D. Meta-analysis
- E. Observer bias
- F. Recall bias

Proceed To Next Item

As part of the Food and Drug Administration drug approval process, a study is conducted to assess the clinical benefit and toxicity of a new drug that is intended to be used in combination with current standard chemotherapy for patients with recurrent glioblastoma. Fifty patients with recurrent glioblastoma enroll in the trial and are randomized to receive standard chemotherapy plus either placebo or 1 of 3 possible doses of the new drug. Study results show a dose-dependent reduction in tumor size with all 3 doses of the new drug, along with a significant increase in adverse drug effects, including hypertension, muscle weakness, lymphopenia, and hypophosphatemia. The researchers conclude that the middle dose of the new drug offers the greatest ratio of benefit to toxicity. Which of the following best describes this type of study?

- A. Phase I clinical trial
- B. Phase II clinical trial
- C. Phase III clinical trial
- D. Phase IV clinical trial
- E. Preclinical study

Proceed To Next Item

A researcher studying physician behavior is interested in how often primary care physicians take the sexual histories of patients during clinic visits. As part of the study, patients who attend a primary care clinic are asked to fill out a questionnaire immediately following a visit with their physician. Once the physicians become aware that their own behavior is being studied, which of the following is most likely to be a potential problem?

- A. Berkson's bias
- B. Hawthorne effect
- C. Lead-time bias
- D. Pygmalion effect
- E. Recall bias

Proceed To Next Item

A group of sports physicians plans to conduct a case-control study to investigate a possible association between adolescent idiopathic scoliosis (AIS) and sacroiliac joint (SIJ) dysfunction in young athletes. The case group will consist of young athletes who were diagnosed with AIS during a regular checkup by a sports physician. Which of the following is the most appropriate control group for this study?

A. Young athletes with a diagnosis of AIS and SIJ
B. Young athletes with a diagnosis of AIS but not of SIJ
C. Young athletes with a diagnosis of AIS irrespective of SIJ status
D. Young athletes with no diagnosis of AIS irrespective of SIJ status
E. Young athletes with no diagnosis of AIS or SIJ
F. Young nonathletes with a diagnosis of AIS but not of SIJ
G. Young nonathletes with a diagnosis of AIS irrespective of SIJ status

Proceed To Next Item

A clinical study compares several cut points for a new biomarker for bacterial bloodstream infection among adult patients in the intensive care unit (ICU) against blood culture results. Analysis shows that a biomarker value ≥2.6 ng/mL has a sensitivity of 32% and a specificity of 96% for predicting bloodstream infections. Which of the following conclusions about the study results is correct?

A. Based on a cut point of ≥2.6 ng/mL, 4% of adult patients in the ICU with bacterial bloodstream infections will be correctly identified.

B. Based on a cut point of ≥2.6 ng/mL, 4% of adult patients in the ICU without bacterial bloodstream infections will be incorrectly identified.

C. Based on a cut point of ≥2.6 ng/mL, 96% of adult patients in the ICU with bacterial bloodstream infections will be correctly identified.

D. Based on a cut point of ≥2.6 ng/mL, 96% of adult patients in the ICU without bacterial bloodstream infections will be incorrectly identified.

E. Of all adult patients in the ICU with bacterial bloodstream infections, 4% will have a biomarker value <2.6 ng/mL.

F. Of all adult patients in the ICU with bacterial bloodstream infections, 96% will have a biomarker value <2.6 ng/mL.

Proceed To Next Item

Researchers want to estimate the association between environmental lead exposure and cognitive deficits in children. Among all children who received preventive care at 5 local pediatric clinics over the last 5 years, they identify 20 children diagnosed with cognitive deficits and 40 without the diagnosis. The researchers then review the patients' medical records and calculate the distance between the patients' residence and known lead-contaminated geographic areas. Which of the following best describes the study design used by the researchers?

- A. Case-control study
- B. Case series study
- C. Cross-sectional study
- D. Prospective cohort study
- E. Randomized control trial

Proceed To Next Item

A study is designed to evaluate the efficacy of a new drug, KM28. The study will compare KM28 plus standard care versus standard care alone with regard to decreasing the incidence of recurrent breast cancer. The Food and Drug Administration (FDA) will approve the new drug if KM28 plus standard care decreases the rate of breast cancer recurrence by at least 40% compared to standard therapy alone. The recurrence rate on standard therapy is found to be 8%. In order for the FDA to approve KM28, what is the maximal incidence of recurrent disease acceptable for women treated with KM28 plus standard therapy?

- A. 2.8%
- B. 3.2%
- C. 3.6%
- D. 4.8%
- E. 5.2%

Proceed To Next Item

A prospective cohort study was conducted to assess the role of daily alcohol consumption in the occurrence of breast carcinoma. The investigators reported a 5-year relative risk of 1.4 for people who consume alcohol daily compared to those who do not. The 95% confidence interval was 1.02-1.85. Which of the following p-values is most consistent with the results described above?

- A. 0.03
- B. 0.06
- C. 0.09
- D. 0.11
- E. 0.20

Proceed To Next Item

A study is designed to describe the manifestations of coronavirus disease 2019 (COVID-19) on imaging studies, particularly on computerized tomography (CT) scans. Eleven patients with COVID-19 are recruited for the study, and their CT findings are studied and characterized. Which of the following best describes this study design?

- A. Case-control
- B. Case series
- C. Clinical trial
- D. Cohort
- E. Cross-sectional

Proceed To Next Item

A hospital wants to estimate the prevalence of diabetic nephropathy in the surrounding population of adults with type 2 diabetes. Kidney biopsy samples are obtained from 500 adult patients with diabetes who receive care at the hospital. The samples are then interpreted by 10 different pathologists, 5 of whom work at the hospital and 5 of whom work at nearby institutions. A preliminary analysis shows that the pathologists who work for the hospital are 3 times more likely to interpret the biopsy samples as diabetic nephropathy compared to those who do not work for the hospital. Which of the following most likely explains this difference in interpretation?

- A. Confounding
- B. Lead-time bias
- C. Observer bias
- D. Recall bias
- E. Selection bias

Proceed To Next Item

Researchers are studying the relationship between essential hypertension and a common mutation in the structure of a sodium channel protein. A study population is randomly selected and blood samples are obtained for leukocyte genotyping. The prevalence of hypertension is determined based on mean blood pressure measurements obtained using standardized ambulatory blood pressure monitoring conducted over 1 week. Based on the analysis results, the researchers conclude that the sodium channel structure mutation is associated with hypertension. Which of the following best describes the study design used by the investigators?

- A. Case-control study
- B. Cross-sectional study
- C. Prospective cohort study
- D. Randomized clinical trial
- E. Retrospective cohort study

Proceed To Next Item

An investigator is conducting a randomized, double-blind, placebo-controlled clinical trial of a new drug for the treatment of peripheral neuropathy in adults with multiple myeloma (MM). One hundred fifty patients with MM are enrolled in the trial and randomized to receive either the new drug (n = 75) or placebo (n = 75). Trial protocol requires that patients in both groups take 1 pill per day and keep a pain diary. After 3 months of treatment, each patient is interviewed, and the pain diaries are reviewed; 9 patients taking the new drug and 3 patients taking placebo did not take the pills as instructed. The investigator decides to conduct an intention-to-treat analysis of the study data. Which of the following best describes how the data pertaining to all patients who did not adhere to protocol should be treated?

- A. Conduct separate analyses of the 12 nonadherent patients and the 138 adherent patients
- B. Exclude all 12 nonadherent patients from analysis
- C. Exclude the 3 nonadherent patients in the group taking placebo from analysis
- D. Exclude the 9 nonadherent patients in the group taking the new drug from analysis
- E. Keep all 12 nonadherent patients in their respective groups for analysis

Proceed To Next Item

A new estrogen receptor agonist is being evaluated for the treatment of postmenopausal symptoms. A prospective study shows that the drug increases the risk of deep vein thrombosis (DVT) in treated women who smoke compared to untreated women who smoke, with a relative risk (RR) of 1.70 and p-value of 0.01. In nonsmokers, no increased risk of DVT is evident with use of the drug (RR = 0.96; p-value = 0.68). Which of the following describes this phenomenon?

- A. Confounding
- B. Effect modification
- C. Latent period
- D. Observer bias
- E. Selection bias

Proceed To Next Item

A physician research group is evaluating the efficacy of a new lipid-lowering drug, Superstatin, which is being marketed directly to consumers as a groundbreaking new therapy to prevent heart attacks. The drug manufacturer claims that the drug is more effective than existing hypolipidemic agents for primary prevention of myocardial infarction. Results of a 5-year, randomized, double-blinded, controlled study to evaluate the efficacy of Superstatin are shown below.

	Number of patients treated with Superstatin	Number of patients treated with control medication
Myocardial infarction	10	25
No myocardial infarction	990	975

Compared to the control medication, how many patients need to be treated with Superstatin to prevent one additional myocardial infarction?

- A. 2
- B. 5
- C. 23
- D. 48
- E. 67
- F. 92
- G. 100

A researcher is interested in assessing the blood folate level of women who live in a population with a high incidence of neural tube defects. She takes a large random sample (*n*) of women age 18-45 and measures their blood folate levels. The researcher finds that the data are normally distributed, and she reports the mean and standard deviation (SD) of the sample. To account for sampling variation, she decides to calculate a 95% confidence interval to estimate the mean of the entire population. The researcher concludes that 2.4 to 4.6 ng/mL might be a likely range for the true, unknown population mean. Which of the following calculations was most likely used to compute this interval estimate of the population mean?

- A. Mean ± 1.96 × SD
- B. Mean ± 1.96 × (SD/$\sqrt{n}$)
- C. Mean ± 2.58 × SD
- D. Mean ± 2.58 × (SD/$\sqrt{n}$)
- E. Mean ± (SD/*n*)

Proceed To Next Item

A study to assess spironolactone's efficacy in patients with heart failure is performed. 450 patients receive either spironolactone or placebo for two years. Neither the patients nor physicians are aware of who takes the drug or placebo. The study setup described above is most effective in preventing:

- A. Beta error
- B. Recall bias
- C. Observer bias
- D. Effect modification
- E. Selection bias

Proceed To Next Item

A new study is conducted to investigate the efficacy of intravenous immunoglobulin versus analgesics on pain alleviation in patients with idiopathic small fiber neuropathy. A total of 100 eligible patients who fulfilled the inclusion/exclusion criteria are assigned to one of two groups based on random selection by a computer. The method of assigning patients to treatment groups in this study is most likely intended to produce which of the following?

A. One group in which participants are blinded to the intervention they receive and another in which participants are not

B. One group in which researchers but not participants are aware of the intervention received and another in which participants but not researchers are aware of the intervention received

C. Two groups of participants that will only be analyzed based on their initial treatment allocation

D. Two groups that have equal numbers of participants

E. Two groups in which participants are similar in underlying characteristics

Proceed To Next Item

A pediatric cardiologist decides to determine whether there is a relationship between body composition and blood pressure in a random sample of children and adolescents age 5-15. He used standard procedures to collect anthropometric measurements that included weight, height, hip circumference (HC), and waist circumference (WC). Systolic blood pressure (SBP) and diastolic pressure (DBP) readings were taken at least 3 times at 5-minute intervals after the participants had been seated, and average SBP and DBP readings were calculated based on these measurements. Which of the following statistical tests is adequate to determine whether there is a relationship between WC and average DBP?

- A. Analysis of variance
- B. Chi-square test
- C. Correlation analysis
- D. Meta-analysis
- E. Two-sample *t*-test

Proceed To Next Item

A physician is conducting a double-blind randomized controlled trial to determine the effect of a new cream in reducing the risk of relapse in chronic recurrent atopic dermatitis. A total of 30 patients with moderate to severe atopic dermatitis who were experiencing a flare are randomly divided into 2 groups: 15 patients will receive the new cream, and 15 patients will receive emollient alone. The rate of relapse after 2 weeks of treatment is 25% in the group who received the new cream and 50% in the group who received emollient alone. However, the difference is found to be not statistically significant ($p = 0.14$). The physician concludes that use of the new cream does not reduce the risk of relapse in chronic recurrent atopic dermatitis. Which of the following is most likely to explain the results of the study?

- A. Ascertainment bias
- B. Confounding bias
- C. Ecologic fallacy
- D. Insufficient statistical power
- E. Recall bias

Proceed To Next Item

A study is conducted to assess the relationship between smoking status and forced expiratory volume in one second (FEV_1). Subjects are randomly selected and categorized based on smoking status. Group A consists of 200 nonsmokers, group B consists of 200 light smokers (1-7 cigarettes per day), group C consists of 200 moderate smokers (8-22 cigarettes per day), and group D consists of 200 heavy smokers (23+ cigarettes per day). FEV_1 is quantitatively measured in all participants using properly calibrated office spirometers. Which of the following is the most appropriate statistical method to compare the mean FEV_1 results among all 4 groups?

- A. Analysis of variance
- B. Chi-square test
- C. Meta-analysis
- D. Multiple logistic regression
- E. Pearson correlation coefficient
- F. Two-sample *t*-test

Proceed To Next Item

An epidemiologist wants to conduct a study on hepatitis C (HCV) transmission in a country with limited healthcare resources. She has access to a cohort of adults newly diagnosed with HCV and a cohort of age-matched HCV-negative adults. She plans to use these 2 cohorts of adults to conduct a case-control study. Which of the following would be the most appropriate measure of interest for this researcher's study?

- A. The average death rate in each cohort
- B. The frequency of past blood transfusions in each cohort
- C. The incidence rate of liver cancer in HCV-positive participants
- D. The rate of eventual HCV infection in HCV-negative participants
- E. The rate of treatment-related adverse effects in HCV-positive participants

Proceed To Next Item

A research group is studying the correlation between BMI and blood pressure in a random sample of children age 12-16. After collecting data, they conduct a correlation analysis at a 1% significance level. The researchers find that BMI correlates with systolic blood pressure with a coefficient of $r = 0.46$ ($p < 0.001$) and diastolic blood pressure with a coefficient of $r = 0.37$ ($p < 0.001$). Which of the following is the most accurate interpretation of these results?

- A. An increase in BMI causes a statistically significant increase in blood pressure in children
- B. Childhood obesity significantly increases the risk of cardiovascular disease later in life
- C. There is a statistically significant negative linear relationship between BMI and blood pressure in children
- D. There is a statistically significant positive linear relationship between BMI and blood pressure in children
- E. There is no statistically significant linear relationship between BMI and blood pressure in children

Proceed To Next Item

Researchers want to explore the association between selective serotonin reuptake inhibitor (SSRI) use and pulmonary tuberculosis. A random sample of subjects age 20-84 with newly diagnosed pulmonary tuberculosis and an independent random sample of subjects without pulmonary tuberculosis are enrolled in the study. Subsequently, subjects who never had a prescription for an SSRI are defined as "never users," and those who have had a prescription for an SSRI are defined as "users." The study compares the frequency of SSRI use in subjects with and without a diagnosis of pulmonary tuberculosis and determines that SSRI use is not associated with pulmonary tuberculosis. Which of the following best describes the design of this study?

- A. Case-control study
- B. Cross-sectional study
- C. Prospective cohort study
- D. Randomized controlled trial
- E. Retrospective cohort study

Proceed To Next Item

A prospective study evaluates the relationship between regular antioxidant supplement use (vitamins C and E) and the risk of stroke in healthy and physically active men age 40-60. The study compares the risk of stroke among men who consumed antioxidant supplements for ≥5 years and among men who consumed antioxidant supplements for <5 years, as compared to a reference group of men who never consumed antioxidant supplements. According to the study results, men who consumed antioxidant supplements for <5 years and men who consumed antioxidant supplements for ≥5 years have stroke relative risks of 0.95 ($p = 0.45$) and 0.75 ($p < 0.01$), respectively, when compared to the reference group. The results of the study were adjusted to account for baseline differences related to healthy behaviors and overall health. Which of the following factors most likely explains why the relative risk of stroke is lower with longer antioxidant use?

- A. Accumulation effect
- B. Lead-time bias
- C. Observer bias
- D. Rare disease assumption
- E. Selection bias

Proceed To Next Item

A study aims to investigate the effectiveness of the topical application of tetracycline ointment in the prevention of surgical-site infection associated with resection of advanced oral cavity cancer. Fifty patients who underwent locoregional resection were assigned by chance to receive standard care alone or tetracycline-ointment in addition to standard care. The patients were then followed for 1 month and the number and severity of surgical-site infections were recorded for each group. Which of the following best describes the study design?

- A. Case-control study
- B. Crossover design
- C. Prospective cohort study
- D. Randomized control trial
- E. Retrospective cohort study

Proceed To Next Item

In a reference sample of hundreds of healthy subjects, the laboratory reference range for a novel marker of cardiac injury is 0.04-0.08 U/mL at the standard 95% level of probability. The marker has very high sensitivity and specificity for myocardial tissue. The clinical cardiology team would like to use a 99.7% reference range to assess patients who come to the emergency department with chest pain and have a high pretest probability of cardiac ischemia. An elevated value of the marker is defined as exceeding the 99.7th percentile of the reference sample. Assuming a normal (Gaussian) distribution with a mean of 0.06 U/mL, which of the following most closely approximates the corresponding reference range?

- A. 0.03 to 0.09
- B. 0.035 to 0.085
- C. 0.045 to 0.075
- D. 0.05 to 0.07
- E. 0.055 to 0.065

Proceed To Next Item

A study compared drug A versus standard therapy in preventing recurrent pulmonary embolism (PE). The absolute risk reduction for drug A versus standard therapy was 4%. The incidence of recurrent PE in the standard therapy group was 6%. There were 24 patients who developed recurrent PE in the drug A group. How many total subjects were there in the drug A group?

- A. 600
- B. 900
- C. 1200
- D. 1500
- E. 1800
- F. 2100

Proceed To Next Item

A study is performed to compare the effect of tramadol when compared to placebo for painful polyneuropathy. Fifty patients are selected and randomly allocated to 1 of 2 treatment sequences: Tramadol followed by placebo, or placebo followed by tramadol. The initial treatment period is delivered for 4 weeks followed by an interim 1-week washout phase, after which the second treatment period is delivered for an additional 4 weeks. After each treatment period, patients use a 10-point numeric scale to rate pain, paresthesia, and tenderness. Which of the following best describes this study design?

- A. Case-control study
- B. Case series study
- C. Crossover study
- D. Cross-sectional study
- E. Prospective cohort study
- F. Retrospective cohort study

Proceed To Next Item

A research group conducted a study to compare the levels of creatine kinase-MB (CK-MB) between type 2 diabetes mellitus (T2DM) patients given statin therapy. Participants were divided into 4 groups based on treatment. Groups I, II, and III consisted of T2DM patients who had been given statin therapy (atorvastatin, simvastatin, rosuvastatin, respectively) for at least 6 months. Group IV consisted of T2DM patients who had not been given statin therapy. Which of the following statistical tests is most appropriate to compare the CK-MB levels between Groups I, II, III, and IV in this study?

- A. Analysis of variance
- B. Chi-square test
- C. Independent *t*-test
- D. Paired *t*-test
- E. Correlation analysis

Proceed To Next Item

A researcher conducts a study to determine the value of measuring kidney volume with computed tomography (CT) to help diagnose chronic kidney disease and quantify kidney damage. In total, 251 patients are enrolled in the study. Correlation analyses are then conducted to evaluate the relationships between kidney volume as measured on CT scans and both glomerular filtration rate and glycosylated hemoglobin (HbA1c). Initial study results show that lower values of HbA1c tended to relate to higher values of kidney volume, and that the relationship was strong and statistically significant. Based on this information, which of the following statements would best describe the associated correlation coefficient?

- A. It is negative and probably closer to −1 than to 0
- B. It is negative and probably closer to 0 than to −1
- C. It is positive and probably closer to 0 than to 1
- D. It is positive and probably closer to 1 than to 0

Proceed To Next Item

A meta-analysis of several trials on the effect of cocoa intake on systolic blood pressure (SBP) revealed the following results:

Study	Mean SBP in cocoa group − mean SBP in control group (mm Hg) [95% confidence interval]
1	−5.2 [−7.3, −3.4]
2	1.6 [−5.3, 10.4]
3	−4.2 [−8.1, −2.7]
4	−2.9 [−4.1, −1.4]
5	−2.8 [−5.2, −1.1]
6	0.8 [0.1, 1.2]
7	1.0 [−1.2, 3.3]
Total	**−2.2 [−2.7, −1.3]**

All the trials evaluated the difference in SBP at 2 weeks. Based on the data, which of the following is the most appropriate conclusion?

A. A higher mean SBP was seen in the cocoa groups overall

B. Cocoa intake should be recommended for blood pressure management

C. Cocoa intake was associated with a statistically significant decrease in SBP

D. Studies 2, 6, and 7 showed a statistically significant increase in SBP

Study	Mean SBP in cocoa group − mean SBP in control group (mm Hg) [95% confidence interval]
1	−5.2 [−7.3, −3.4]
2	1.6 [−5.3, 10.4]
3	−4.2 [−8.1, −2.7]
4	−2.9 [−4.1, −1.4]
5	−2.8 [−5.2, −1.1]
6	0.8 [0.1, 1.2]
7	1.0 [−1.2, 3.3]
Total	**−2.2 [−2.7, −1.3]**

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- A. A higher mean SBP was seen in the cocoa groups overall
- B. Cocoa intake should be recommended for blood pressure management
- C. Cocoa intake was associated with a statistically significant decrease in SBP
- D. Studies 2, 6, and 7 showed a statistically significant increase in SBP
- E. There was no statistically significant change in SBP overall

Proceed To Next Item

The aim of a prospective cohort study conducted in a group of adults with diagnosed type 2 diabetes mellitus (T2DM) is to investigate the association between the presence of morbid obesity (BMI >40 kg/m^2) and the risk of developing diabetic nephropathy. One of the groups in the study consists of adults with T2DM, a BMI >40 kg/m^2, and no diabetic nephropathy. Which of the following is the most appropriate comparison group for this prospective cohort study?

- A. Adults with T2DM who have morbid obesity (BMI >40 kg/m^2) and diabetic nephropathy
- B. Adults with T2DM who have normal weight (BMI 18.5 to <25 kg/m^2) and diabetic nephropathy
- C. Adults with T2DM who have normal weight (BMI 18.5 to <25 kg/m^2) and no diabetic nephropathy
- D. Adults without T2DM who have morbid obesity (BMI >40 kg/m^2) and no diabetic nephropathy
- E. Adults without T2DM who have normal weight (BMI 18.5 to <25 kg/m^2) and diabetic nephropathy

Proceed To Next Item

A genome-wide association study (GWAS) of rheumatoid arthritis (RA) is performed in a cohort of Portuguese patients, including 907 cases with RA and 1,524 controls without RA. Logistic regression is used to test the association between RA and hundreds of thousands of loci. These association results are then compared with data from a European GWAS cohort of 4,036 patients with RA and 6,959 patients without RA. Finally, the Portuguese and European study results are combined into a meta-analysis. Based on these data, the investigators identify 3 new loci that are associated with RA based on a significance level threshold of 5×10^{-8}:

	European study		Portuguese study		Meta-analysis	
	Odds ratio	***p*-value**	**Odds ratio**	***p*-value**	**Odds ratio**	***p*-value**
Locus 1	0.53	8.36×10^{-7}	0.61	0.013	0.55	3.5×10^{-8}
Locus 2	1.16	8.40×10^{-7}	1.14	0.019	1.16	4.9×10^{-8}
Locus 3	1.63	0.0000015	1.77	0.0074	1.66	4.1×10^{-8}

Previous studies had identified 30 loci that accounted for <35% of disease heritability for RA. Which of the following statements is correct regarding this study?

- A. Combining the results of the European and Portuguese studies into a meta-analysis decreases the power
- B. Logistic regression is used because there is a stepwise increase in the strength of association from Locus 1 to Locus 3
- C. The association between Locus 1 and RA in the meta-analysis is not statistically significant because the odds ratio is <1
- D. The threshold used for the *p*-value in the meta-analysis is 5×10^{-8} because of the large number of

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	Odds ratio	***p*-value**	**Odds ratio**	***p*-value**	**Odds ratio**	***p*-value**
Locus 1	0.53	8.36×10^{-7}	0.61	0.013	0.55	3.5×10^{-8}
Locus 2	1.16	8.40×10^{-7}	1.14	0.019	1.16	4.9×10^{-8}
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- B. Logistic regression is used because there is a stepwise increase in the strength of association from Locus 1 to Locus 3
- C. The association between Locus 1 and RA in the meta-analysis is not statistically significant because the odds ratio is <1
- D. The threshold used for the *p*-value in the meta-analysis is 5×10^{-8} because of the large number of loci studied
- E. With this meta-analysis, the 33 identified loci account for most disease heritability in RA