

UNIVERSITY COLLEGE LONDON

UNIVERSITY OF LONDON

EXAMINATION FOR INTERNAL STUDENTS

FOR THE FOLLOWING QUALIFICATIONS:

B.Sc. (*Intercal*)

Orthopaedics 3004: Research Methodologies and Transferable Skills

COURSE CODE : ORTH3004

DATE : 31-MAY-05

TIME : 10.00

TIME ALLOWED : 2 Hours

05-C1009-3-50

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TURN OVER

Answer only **THREE** questions out of the following **FOUR**.
All four questions carry an equal number of marks.

Answer each question in a **SEPARATE** book

1. Identify the weaknesses of each of the following studies (a - d) and suggest how each study could be improved:
 - a) **Title:** Substance D2SB alleviates pain in patients with low back pain.
Abstract: 200 patients reporting to their GP with acute low back pain gave informed consent to participate in a trial of a new pain medication (D2SB). Each patient recorded his pain score before and after treatment with D2SB using a validated visual analogue scale. A significant improvement ($p=0.007$) in pain score was observed following treatment. Therefore D2SB is an effective treatment for acute low back pain.
 - b) **Title:** Substance Y, incorporated as a surface treatment on hip implant stems produces no improvement in implant failure over 10 ten years.
Abstract: A prospective study comparing 2 total hip replacement implant designs has been undertaken over a period of 10 years. Two groups of 20 patients were randomly assigned to receive one or other implant. The implants were identical apart from the treatment applied to the stem using Substance Y. The results showed 3 failures in the non-treated group and 4 failures in the treated group. A chi-squared test showed no significant difference between the two groups. It can be concluded that there is no benefit in using Substance Y.
 - c) **Title:** Osteoarthritis is prevented by regular consumption of red wine.
Abstract: A random sample of 1000 Stanmore residents has shown an association between regular consumption (5-10 units of red wine per week) and clinically confirmed Dupuytren's contracture. It is recommended that between 5 and 10 units of red wine be consumed per week to prevent Dupuytren's contracture.
 - d) **Title:** Identification of factors that predict risk for idiopathic scoliosis
Abstract: A prospective study is undertaken in a screening programme of 500 female 10-year-old schoolchildren to identify factors associated with the risk for develop idiopathic scoliosis. 20 factors were assessed including body weight, eye colour, place of birth, dietary consumption of milk, age of parents etc. A follow up 3 years later found that children who developed scoliosis had a significantly lower dietary consumption of milk ($p=0.049$). This study suggests that school milk should be reintroduced to help prevent idiopathic scoliosis.

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2. You are planning an experiment to determine whether regular consumption of vitamin D is an effective treatment for early onset of osteoarthritis. Provide an outline for a proposed study design.

3. In a gait analysis study to examine the EMG of children with diplegic cerebral palsy you need to investigate the activation of certain muscle groups throughout the gait cycle. Describe the data you need to acquire, the equipment that you would use and the signal analysis methods that you would employ to determine the sequencing of the muscles during a representative gait cycle.

4. **Shoulder imaging abnormalities in individuals with paraplegia. Boninger ML, Towers JD, Cooper RA, Dicianno BE, Munin MC.**
J Rehabil Res Dev. 2001 Jul-Aug;38(4):401-8.

You have been chosen to present this paper in a journal club. Summarise the strengths and weaknesses of the study as bullet points by writing down two lists. Each list should contain five to ten points. In about 100 words identify how the results of this study should inform clinicians and researchers about pathology in wheelchair users.