UE / ENSEIGNANT : Anglais - York - Riou

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REMARQUES :

Study designs

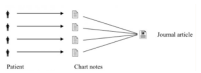
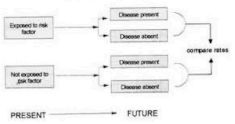
Study designs :

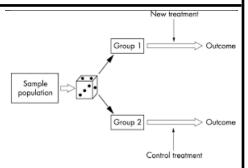
- RCT : A study where participants are randomly assigned to intervention or control groups to test the effect of a treatment.
- Case report : A detailed description of a single patient's medical history or condition, highlighting unique or rare findings.
- Cohort : An observational study that follows a group of individuals over time to assess the relationship between exposures and outcomes.
- Meta analysis : A statistical analysis that combines results from multiple studies to derive a more robust conclusion.
- Systematic review : A comprehensive summary of all relevant studies on a specific question, following a predefined methodology.
- Case control : A retrospective study comparing individuals with a condition (cases) to those without it (controls) to identify potential risk factors.

Pyramid of evidence

- Meta analysis and systematic reviews} secondary (👁)
- RCT }primary (interventional)
- Cohorts }primary (👁)
- Case controls} primary(👁)
- Case report/case series }primary (👁)

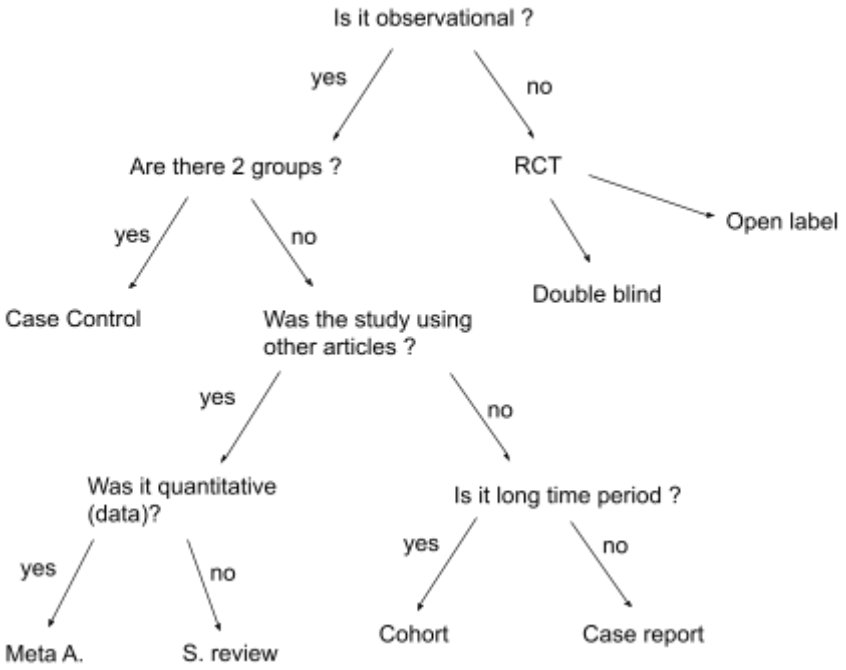
Study design table

Study design	General purpose	Advantages	Disadvantages	Visual representation
Case report/case series	A detailed description of a patient's or several patients' medical history, diagnosis, treatment, and outcome. Typically documents unusual or rare cases or reports new or unexpected clinical findings. Help to better understand a disease's presentation, diagnosis, and treatment. Important tools for understanding rare or unusual diseases.	Able to describe rare or poorly understood conditions or diseases Helpful in generating hypotheses and identifying patterns or trends in patient populations Can be conducted relatively quickly and at a lower cost compared to other research designs	Prone to selection bias, meaning that the patients included may not be representative of the general population Lack a control group, which makes it difficult to conclude the effectiveness of different treatments or interventions They are descriptive and cannot establish causality or control for confounding factors	
Case control	Compares people who have developed a disease of interest with people who have not developed the disease to identify potential risk factors such as age, sex, lifestyle factors, or environmental exposures. By comparing the prevalence of risk factors researchers can determine the association between the risk factors and the disease.	Useful for studying rare diseases, as they allow researchers to selectively recruit patients with the disease of interest Useful for investigating potential risk factors for a disease, as the researchers can collect data on many different factors from both groups.	Selection bias, groups may not be representative of the general population or have different risk factors Cannot establish causality, as they can only identify associations between factors and disease May be limited by the availability controls, as finding controls who have similar characteristics to the cases can be challenging	
Cohort	Follows a group of individuals over time to investigate the relationship between an exposure or risk factor and a particular outcome or health condition. Can be either prospective or retrospective.	Considered to be the most appropriate study design for investigating the temporal relationship between exposure and outcome Can provide estimates of incidence and relative risk, which are useful for quantifying the strength of the association between exposure and outcome Can investigate multiple outcomes or endpoints	Can be expensive and timeconsuming to conduct, particularly for long-term follow-up May suffer from selection bias, as the sample may not be representative of the entire population being studied May suffer from attrition bias, as participants may drop out or be lost to follow-up over time	

		associated with a particular exposure, which can help to identify unexpected effects or outcomes		
Randomised Controlled Trial	An important study design commonly used in medical research to determine the effectiveness of a treatment or intervention. It is considered the gold standard in research design because it allows researchers to draw cause-andeffect conclusions about the effects of an intervention.	Considered the most reliable study design for establishing causal relationships between interventions and outcomes and determining the effectiveness of interventions Randomisation of participants to intervention and control groups ensures that the groups are similar at the outset, reducing the risk of selection bias and enhancing internal validity Using a control group allows researchers to compare with the group that received the intervention while controlling for confounding factors	Can raise ethical concerns; for example, withholding an intervention from a control group, especially if the intervention is known to be effective Can be expensive and timeconsuming to conduct Often have strict inclusion and exclusion criteria, which may limit the generalisability of the findings to broader populations May not always be feasible or practical for certain research questions, especially in rare diseases or when studying longterm outcomes	
Meta-analysis	A type of study that involves extracting outcome data from all relevant studies in the literature and combining the results of multiple studies to produce an overall estimate of the effect size of an intervention or exposure.	Combines the results of multiple studies, resulting in a larger sample size and increased statistical power, to provide a more comprehensive and precise estimate of the effect size of an intervention or outcome Can help to identify sources of heterogeneity or variability in the results of individual studies by exploring the influence of different study characteristics or subgroups	Susceptible to publication bias, where studies with statistically significant or positive results are more likely to be published than studies with nonsignificant or negative results. This bias can lead to an overestimation of the treatment effect. May not be appropriate if the studies included are too heterogeneous, as this can make it difficult to draw meaningful conclusions Depends on the quality and completeness of the data available from the individual studies and may be limited by	

		Can help to resolve conflicting results or controversies in the literature by providing a more robust estimate of the effect size	the lack of data on certain outcomes or subgroups	
Systematic review	Examines all the literature related to a specific research question in a standardised way. Aims to put relevant data into a more organized collection and to identify opportunities for further research on a topic.	Researchers can answer specific research questions of high importance. For example, the efficacy of a particular drug in the treatment of an illness. Each stage of the review is predefined to the last detail and made publicly available, even before starting the review process. This makes all the stages in the methodology transparent and reproducible. Involves a thorough search of all the available data on a certain topic. It is exhaustive and considers every bit of evidence in synthesizing the outcome. Every detail in each stage of the methodology is pre-determined and published before the review starts. This helps peer-reviewers assess the replicability of the reviews. Replicability helps establish a greater degree of confidence in the review.	Due to the popularity they have gained, they tend to be used more than required. This results in redundancy. More susceptible to certain types of biases. Most of the known errors arise in the selection and publication stages. The eligibility criteria helps to avoid selection bias. Poor study design and execution can also result in a biased outcome. Selective outcome reporting is a major threat. The author or reviewer may decide to only report a selection of the statistically significant outcomes that suit his interest.	

Study designs



SOCRATIVE

Question 1

We pooled individual-level data from 7 cohort studies comprising 102 128 men and women who were free of existing coronary artery disease at baseline (1985–2000). Questionnaires were used to measure job strain (yes v.no) and 4 lifestyle risk factors: current smoking, physical inactivity, heavydrinking and obesity. We grouped participants into 3 lifestyle categories: healthy (no lifestyle risk factors), moderately unhealthy (1 risk factor) and unhealthy (2–4 risk factors). The primary outcome was incident coronary artery disease (defined as first nonfatal myocardial infarction or cardiac-related death).

A. RCT
B. Systematic review
C. Meta-analysis
D. Retrospective cohort study
E. Case control
F. Case report

Réponse : C

Question 2

There is a suspicion that zinc oxide, the white non-absorbent sunscreen traditionally worn by lifeguards is more effective at preventing sunburns that lead to skin cancer than absorbent sunscreen lotions. A study was conducted to investigate if exposure to zinc oxide is a more effective skin cancer prevention measure. The study involved comparing a group of former lifeguards that had developed cancer on their cheeks and noses (cases) to a group of lifeguards without this type of cancer and assess their prior exposure to zinc oxide or absorbent sunscreen lotions. This study would be retrospective in that the former lifeguards would be asked to recall which type of sunscreen they used on their face and approximately how often. This could be either a matched or unmatched study, but efforts would need to be

made to ensure that the former lifeguards are of the same average age, and lifeguarded for a similar number of seasons and amount of time per season.

A. Case control
B. Meta-analysis
C. Retrospective cohort study
D. Prospective cohort study
E. Systematic review
F. Double Blind

Réponse : A

Question 3

As an example, imagine that a school seeks to test whether introducing a healthy meal at lunchtime improves the overall fitness of the children. It decides to do this by giving half of the children healthy salads and wholesome meals, whilst the other group carries on as before. At regular intervals, the researchers note the cardiovascular fitness of the children, looking to see if it improves.
What would be the appropriate study design?

A. Case control
B. Systematic review with meta analysis
C. Case report
D. RCT
E. Prospective cohort
F. Double blind

Réponse : D

Question 4

Obesity is an important risk factor for type 2 diabetes. Weight loss in patients with type 2 diabetes is associated with improved glycemic control and reduced cardiovascular disease risk factors, but weight loss is notably difficult to achieve and sustain with caloric restriction and exercise. The purpose of this study was to assess the impact of treatment with orlistat, a pancreatic lipase inhibitor, on weight loss, glycemic control, and serum lipid levels in obese patients with type 2 diabetes on sulfonylurea medications.
In a multicenter 57-week study, 120 mg orlistat or placebo was administered orally three times a day with a mildly hypocaloric diet to 391 obese men and women with type 2 diabetes who were aged > 18 years, had a BMI of 28–40 kg/m2, and were clinically stable on oral sulfonylureas. Changes in body weight, glycemic control, lipid levels, and drug tolerability were measured.

A. Double blind
B. Prospective cohort
C. Retrospective cohort
D. Meta-analysis

E. Case control
F. Systematic review

Réponse A

Question 5

Although several epidemiologic studies have been conducted on alcohol consumption and bladder cancer risk, the risk according to quantity and type of alcohol consumed is not clear. The authors investigated these associations in a large prospective study on diet and cancer among 120,852 subjects in the Netherlands aged 55–69 years at baseline (1986). Subjects completed a questionnaire on risk factors for cancer, including alcohol consumption. Follow-up for incident cancer was established by record linkage to cancer registries. The analysis was restricted to a follow-up period of 6.3 years and was based on 594 cases with bladder cancer and 3,170 subgroup members. The authors corrected for age and smoking in multivariable analyses.

The incidence rate ratios for men who consumed <5, 5–<15, 15–<30, and ≥30 grams of alcohol per day were 1.49, 1.52, 1.16, and 1.63 compared with nondrinkers, respectively (p for trend = 0.13).Alcohol consumed from beer, wine, and liquor was associated with moderately elevated risks, although most were not statistically significant.The incidence rate ratios for women varied around unity. The results of this study do not suggest an important association between alcohol consumption and bladder cancer risk.

A. Prospective cohort study
B. Prospective systematic review
C. RCT
D. Meta-analysis
E. Retrospective case control
F. Single-blind RCT

Réponse A

Question 6

With the use of the framework advocated by the Grading of Recommendations Assessment, Development. and Evaluation (GRADE) Working Group, our aims were to develop evidence-based recommendations that may be used to answer the following PICO [Population, Intervention, Comparator, Outcomes] question: In the obtunded adult blunt trauma patien should cervical collar removal be performed after a negative high-quality cervical spine (C-spine) caputed tomography (CT) result alone or after a negative nigh-quality C-spine CT result combined with adjunct imaging, to reduce peri-clearance events, such as new neurologic change, unstable C-spine injury, stable C-spine injury, need for post-clearance imaging, false-negative CT imaging result on re-review, pressure ulcers, and time to cervical collar clearance?

Methods: Our protocol was registered with the PROSPERO international prospective register on August 23, 2013 (Registration Number: CRD42013005461). Eligibility criteria consisted of adult blunt trauma patients 16 years or older, who underwent C-spine CT with axial thickness of less than 3 mm and who were obtunded using any definition. Quantitative

synthesis via meta analysis was not possible because of pre-post, partial-cohort, quasi-experimental study design limitations and the consequential incomplete diagnostic accuracy data.
Results: Of five articles with a total follow-up of 1,017 included subjects, none reported new neurologic changes (paraplegia or quadriplegia) after cervical collar removal. There is a worst-case 9% (161 of 1,718 subjects in 11 studies) cumulative liter&e incidence of stable injuries and a 91% negative predictive value of no injury, after coupling a negative high-quality C-spine CT result with 1.5-T magnetic resonance imaging, upright x-rays, flexion-extension CT, and/or clinical follow-up. Similarly, there is a best-case 0% (0 of 1,718 subjects in 11 studies) cumulative literature incidence of unstable injuries after negative initial imaging result with a high-quality C-spine CT
In obtunded adult blunt trauma patients, we conditionally recommend cervical collar removal after a negative high-quality C-spine CT scan result alone.

A. Meta-analysis
B. Retrospective cohort study
C. Double blind RCT
D. Systematic review
E. Case control

Réponse D

Question 7
This study was undertaken in 274 hospitals in 40 countries. 20 211 adult trauma patients with, or at risk of, significant bleeding were assigned within 8h of injury to either tranexamic acid (loading dose 1g over 10 min then infusion of 1 g over 8 h) or matching placebo. Both participants and study staff (site investigators and trial coordinating centre staff) were masked to treatment allocation. The primary outcome was death in hospital within 4 weeks of injury, and was described with the following categories: bleeding, vascular occlusion (myocardial infarction, stroke and pulmonary embolism),multiorgan failure, head injury, and other.
All analyses were by intention to treat. This study is registered as ISRCTN86750102, Clinicaltrials.gov
NCT00375258, and South African Clinical Trial Register DOH-27-0607-1919.
Findings 10 096 patients were allocated to tranexamic acid and 10 115 to placebo, of whom 10 060 and 10
067, respectively, were analysed. All-cause mortality was significantly reduced with tranexamic acid (1463
[14•5%] tranexamic acid group
vs 1613 [16•0%] placebo group; relative risk 0-91, 95% CI 0-85-0:97; p=0-0035). The risk of death due to bleeding was significantly reduced (489 [4-9%] vs 574 [5-7%]; relative risk 0-85, 95% CI 0-76-0•96; p=0-0077).

A. Double-blind case report
B. RCT
C. Prospective cohort
D. Systematic review and meta-analysis
E. Retrospective RCT

Réponse B

Question 8

Electronic seraches were performed using Ovid Medline, Cochrane Central Register of Controlled Trials (CCTR), Cochrane Database of Systematic Reviews (CDSR), ACP Journal Club, and Database of Abstracts of Review of Effectiveness (DARE) from January 1985 to October 2012. To achieve the maximum sensitivity of the search strategy and identify all studies, we combined the terms "mesothelioma" and
"pneumonectomy" as either key words or MeSH terms. The reference lists of all retrieved articles were reviewed for further identification of relevant studies.
All identified articles were systematically assessed using the inclusion and exclusion criteria
Eligible studies included those in which patients with histologically proven MPM were treated by EPP, neoadjuvant or adjuvant chemotherapy, and adjuvant radiotherapy. All forms of systemic chemotherapy and radiotherapy were included. For studies that included patients who underwent TMT as a subset of patients who had other treatment regimens, results for patients who underwent TMT were extracted when possible. Review articles were omitted due to potential publication bias and possible duplication of results.
All data were extracted from article texts, tables and figures. Two investigators (D.T. and P.M.) independently reviewed each retrieved article. Discrepancies between the two reviewers were resolved by discussion and consensus. The final results were reviewed by the senior investigators (C.C. and T.D. Y.).

A. Meta-analysis
B. Double-blind RCT
C. Open-label RCT
D. Prospective cohort study
E. Systematic review

Réponse E

Question 9

Using the Danish civil registration system, which contains information on the sex, date of birth, and vital status of all Danish citizens, we identified a nationwide population group, including all individuals aged 15-75 years living in Denmark between 2002 and 2012. By use of the unique personal identification number assigned to all Danish citizens at birth, we could link the source population to other national registries.
From the national patient registry, a registry containing information on all hospital admissions in Denmark since 1977, and since 1995 extended to include all outpatient visits and emergency room contacts, we identified people with inflammatory bowel disease from ICD-8 and ICD-10 codes (international classification of diseases, eighth and 10th revisions, respectively): ICD-8 codes 56300-02 and 56308-09 and ICD-10 code K50 for Crohn's disease; ICD-8 codes 56319 and 56309 and ICD-10 code K51 for ulcerative colitis.
From the Danish drug prescription registry, established in 1995 and containing individual level information on all prescriptions redeemed at Danish pharmacies, we obtained data on drugs. Although the treatment with TNF-a inhibitors for inflammatory bowel disease were introduced in Denmark in 1999, we started the study in 2002 and excluded people who used TNF-a inhibitors before the start of the study; in this way, early drug users who were treated in the first years after the introduction of TNF-a inhibitors (who are likely to be different from the drugs' eventual stable user population, in terms of factors such as disease severity and therefore may introduce bias19) were not eligible for inclusion.
To ensure completeness of data we obtained information on use of TNF-a inhibitors (including infliximab, adalimumab, and certolizumab pegol) from four sources (...). Some patients were registered in more than one of the four sources; however, we considered one

registration as sufficient to be defined as having used drugs. We defined patients asTN-a inhibitor users from the date of first dose and onwards; thus we categorised patients as ever users once they had been "exposed" to the drug.
The main outcome was any serious infections, defined as a diagnosis of infection associated with hospital admission (including primary and secondary discharge diagnoses) after cohort entry (outpatient diagnoses of infections were not included).

A. Retrospective case control study
B. cohort study
C. Systematic review
D. Metal-analysis
E. Open-label RCT

Réponse B

Question 10
Some autoimmune and chronic inflammatory disorders are associated with increased risks of non-Hodgkin lymphoma (NHL). Because different' NHL subtypes develop at different stages of lymphocyte differentiation, associations of autoimmune and inflammatory disorders with specific NHL subtypes could lead to a better understanding of lymphomagenic mechanisms.
In a population-based study in Denmark and Sweden, 3055 NHL patients and 3187 matched contral subjects were asked about their history of autoimmune and chronic inflammatory disorders, markers of severity, and treatment. Logistic regression with adjustment for study matching factors was used to calculate odds ratios (ORs) and 95% confidence intervals (Cls) for NHL overall and for NHL subtypes.
Risks of all NHL were increased in association with rheumatoid arthritis (OR = 1.5, 95% CI = 1.1 to 1.9), primary Sjögren syndrome (OR =6.1, 95% CI = 1.4 to 27), systemic lupus erythematosus (OR = 4.6, 95% CI = 1.0 to 22), and celiac disease (OR = 2.1, 95% CI = 1.0 to 4.8). All of these conditions were also associated with diffuse large B-cell lymphoma, and some were associated with marginal zone, lymphoplasmacy tic, or T-cell lymphoma.
Ever use of nonsteroidal anti-inflammatory drugs, systemic corticosteroids, and selected immunosuppressants was associated with risk of NHL in rheumatoid arthritis patients but not in subjects without rheumatoid arthritis. Also, multivariable adjustment for treatment had little impact on risk estimates. Psoriasis, sarcoidosis, and inflammatory bowel disorders were not associated with increased risk of NHL overall or of any NHL subtype.

A. Prospective case control
B. Meta-analysis
C. RCT
D. Cohort study
E. None of the above

Réponse E: case control

⚠️⚠️
Elles ont fait un diaporama pour réviser tout ce qu'on a vu pendant le semestre.
Semaine prochaine: dernier cours, correction d'un examen blanc à faire avant