Statistics for Clinicians

	Topic	Date	Hours
Basic			
Day 1	Essentials	Mon 20 Jan 7 – 9 PM	2
Day 2	Chi-square – Unpaired t-test	Thu 23 Jan: 7 – 9 PM	2
Day 3	ANOVA – Correlation – Simple linear regression	Sun 26 Jan: 7 – 9 PM	2
Day 4	Paired design	Wed 29 Jan: 7 – 9 PM	2
Day 5	Practice	Sun 2 Feb: 7 – 9 PM	2
Advanced			
Day 1	Non-parametric	Wed 5 Feb: 7 – 9 PM	2
Day 2	Time to event – Clinical outcomes	Sat 8 Feb: 7 – 9 PM	2
Day 3	Diagnostic accuracy measures	Mon 10 Feb: 7 – 9 PM	2
Day 4	Practice	Wed 12 Feb: 7 – 9 PM	2
Day 5	Multivariable analysis 1	Mon 17 Feb: 7 – 9 PM	2
Day 6	Multivariable analysis 2	Thu 20 Feb: 7 – 9 PM	2
Day 7	Practice	Mon 23 Feb: 7 – 9 PM	2

Statistics for clinicians (S4C) – Basic

SD, SEM, confidence intervals, P value, Chi-square and Student's tests.

Expressing biological data and testing hypothesis:

- Mean, standard deviation, standard error of mean
- The Normal distribution
- The confidence intervals of a subject
- The confidence intervals of mean
- The P value and the value of P

Application: Hands on SPSS, Testing normality, online calculators: confidence interval of a proportion

Testing the significance of association of 2 qualitative variables:

- Chi-square test,
- Corrected Chi-square
- Fisher's exact test.

Application: Hands on Statistical software.

Comparison of 2 means

- Student's test.

Application: Hands on Statistical software, use of student's table to calculate the confidence intervals of a small sample.

One-way ANOVA, Post Hoc analysis, correlation coefficient, simple regression, paired tests.

Analysis of the distribution of means among multiple groups

- One-Way ANOVA and post-Hoc tests
- ANOVA versus multiple t-tests, which to choose?

Application: Hands on Statistical software: post hoc analysis, choosing the appropriate test. How to compensate for the inflation of risk of error?

Testing the significance of associate of 2 quantitative variables

- The coefficient of correlation (r)
- Simple regression

Application: Hands on Statistical software, can we calculate a confidence interval for r?

The paired design

- Indications, conditions of application, power and limitations.
- Paired Student's test
- McNemar test (paired Chi-square)
- Calculation of sample size of a paired design.

Application: Hands on Statistical software

Statistics for clinicians (S4C) – Advanced

non-parametric tests, time to event studies and multivariate analysis.

Distribution-free tests

- Indications, conditions of application, power and limitations
- The Mann and Whitney test

Application: Hands on Statistical software, comparison of results obtained with parametric versus non-parametric (distribution-free) tests.

Time to events studies

- Indications, conditions of application, power and limitations.
- Kaplan Meier method.
- The Log-rank test

Application: hands on Statistical software, how to read and interpret a Kaplan-Meier curve?

Choosing the appropriate bivariate statistical test: a practical algorithm

Common indices of trial outcomes

- Relative and absolute risks,
- Odds ratio,
- Number needed to treat,
- Se, Sp, PPV, NPV,
- ROC analysis.

The multivariate analysis

- Introduction and general equation.
- Indications, conditions of application, power and limitations.
- Multiple regression analysis.
- Logistic regression analysis.
- Cox proportional hazard.