

## HDS 200B-Biostatistics for Researchers

### tools for evidence based medicine (below subject to change)

Fall 2017 - Cedars/Sinai Medical Center - Tuesdays, Thursdays, 5:15 pm to 6:45 pm

**No class Sept 21, 28, Nov 23** P&S = chapter in Petrie & Sabin 3<sup>rd</sup> ed

date	topic	Notes	P&S
Sept 5	Introduction – Confounding, bias	I	12-16
Sept 7	Study design – observational, experimental	I	12-16
Sept 12	Descriptive statistics for continuous data	II	1,4-6
Sept 14	Descriptive stats for binary and survival data, Bayesian paradigm	II	45
Sept 19	Introduction to JMP software-descriptive stats (continued)	II	45
<b>Sept 21</b>	<b>No class</b>		
Sept 26	Elementary probability theory – Normal distribution Normal, Binomial & Poisson probability distributions	III	7-9
<b>Sept 28</b>	<b>No class - graduation</b>		
Oct 3	Normal, Binomial & Poisson probability distributions-(cont)	III	7-9
Oct 5	Central Limit Theorem, Confidence intervals, meta analysis	III, IV	8, 10,11
Oct 10	Hypothesis testing & equivalence testing	IV	17,18,21
<b>Oct 12</b>	<b>Guest speaker – Tim Dashivich</b>		
Oct 17	Power, sample size, multiple testing	V	18,36
Oct 19	multiple testing (continued)		
Oct 24	correlation & bivariate linear regression	VIIIa	26,27,28
Oct 26	Multiple linear regression	VIIIb	21,22,29
Oct 31	Overview of regressions- Linear, Logistic, Poisson, Cox	VIII	29,30,31
Nov 2	Survival- Censoring, Kaplan-Meier- log rank test, Competing risks	X	44
Nov 7	Survival – Cox model and survival calculator	X	44
Nov 9	comparing means – t tests, analysis of variance (ANOVA)	VI	19-22
Nov 14	ANOVA (continued)	VI	19-22
Nov 16	binary outcomes - comparing proportions – chi square & goodness of fit tests	VII	23-25
Nov 21	Logistic regression & propensity scores	IX	30
<b>Nov 23</b>	<b>No class - thanksgiving</b>		
Nov 28	Advanced topic - classification trees	X	
Nov 30	Advanced topic-Principle components & Factor analysis		
Dec 5	Tips on presentations in the literature- reviewer comments		
Dec 7	Class Final presentations		
Dec 12	Class Final presentations		
Dec 14	Class Final presentations (if needed)		

Suggested texts:

**P&S- Medical Statistics at a Glance, Aviva Petrie, Caroline Sabin, 3<sup>rd</sup> ed, Blackwell Publishing, 2009**—*chapters roughly corresponding to lectures are indicated above*

Designing Clinical Research, S Hully, S Cummings, W Browner, D Grady, T Newman,  
3<sup>rd</sup> ed, Lippincott, Williams & Wilkins, Nov 2006

Reinhart Alex, Statistics Done Wrong No Starch Press 2015

Wainer Howard, Truth or Truthiness, Cambridge Univ Press 2015

Wheelan Charles, Naked Statistics WW Norton & Co, 2013

Moye, Lemuel Statistical Reasoning in Medicine, the intuitive p value primer  
Springer 2000

## **Bibliography for Basic Biostatistics**

- Altman, Douglas G Practical Statistics for Medical Research, Chapman and Hall 1991
- Bailer & Mosteller Medical Uses of Statistics- NEJM Books 1986. Not a statistics text but documents how statistics is used in the New England Journal of Medicine.
- Bland Martin An Introduction to Medical Statistics , Oxford University Press 1987
- Bland M, Peacock J Statistical Questions in Evidence Based Medicine, Oxford Univ Press 2000
- Bourke, Daly and McGilvey Interpretation & Uses of Medical Statistics Blackwell Scientific 1985
- Campbell, M J, Machin, D Medical Statistics, a Commonsense Approach Wiley 1990
- Colton T Statistics in Medicine Little & Brown 1974
- Dawson-Saunders B, Trapp RG Basic and Clinical Biostatistics Appleton & Lange 1990
- Dixon WJ and Massey FJ Introduction to Statistical Analysis 4th ed 1983
- Elston and Johnson Essentials of Biostatistics 1987
- Freedman, Pisani and Purves Statistics WW Norton 1978
- Feinstein A, Clinical Biostatistics CV Mosby Co 1977
- Furberg B, Furberg C All That Glitters is Not Gold: Evaluating Clinical research, Springer 2007– Well illustrated book that discusses design-highly recommended**
- Gigerenzer, Gerd Calculated Risks Simon & Schuster 2002 – Good book for sensitivity & specificity discussion**
- Glantz, SA Primer of Biostatistics 1981
- Ingelfinger, Mosteller et al Biostatistics in Clinical Medicine Macmillan 1987
- Matthews, Farewell Using and Understanding Medical Statistics Karger 1988
- Michael, Boyce and Wilcox, Biomedical Bestiary - 1984- Little Brown Basic epi in fun style
- Mlodinow, Leonard The Drunkard's Walk – How Randomness rules our lives Vintage 2009**
- Pocock SJ Clinical Trials, A Practical Approach Wiley 1983
- Scakett et. al. Evidence Based Medicine Churchill Livingstone 2000
- Samuels, ML Statistics for the Life Sciences Dellen/McMillan 1989
- Van Belle, Gerald, Statistical Rules of Thumb Wiley 2002 – **good summary of practical methods**