
Contents

Part I Evidence Based Medicine in Orthopaedics

1	What Is Evidence-Based Medicine?	3
	Eleonor Svantesson, Eric Hamrin Senorski, Jón Karlsson, Olufemi R. Ayeni, and Kristian Samuelsson	
2	What Is the Hierarchy of Clinical Evidence?	11
	Vishal S. Desai, Christopher L. Camp, and Aaron J. Krych	
3	Bias and Confounding	23
	Naomi Roselaar, Magaly Iñiguez Cuadra, and Stephen Lyman	
4	Ethical Consideration in Orthopedic Research	33
	Jason L. Koh and Diego Villacis	
5	Conflict of Interest	43
	Michael Hantes and Apostolos Fyllos	
6	Ethics in Clinical Research	49
	Naomi Roselaar, Niv Marom, and Robert G. Marx	

Part II How to Get Started with Clinical Research?

7	How to Get Started: From Idea to Research Question	57
	Lachlan M. Batty, Timothy Lording, and Eugene T. Ek	
8	How to Write a Study Protocol	65
	Lukas B. Moser and Michael T. Hirschmann	
9	The Ethical Approval Process	75
	Karren Takamura and Frank Petriglano	
10	How to Assess Patient's Outcome?	83
	Yuichi Hoshino and Alfonso Barnechea	
11	Basics of Outcome Assessment in Clinical Research	89
	Monique C. Chambers, Sarah M. Tepe, Lorraine A. T. Boakye, and MaCalus V. Hogan	
12	Types of Scoring Instruments Available	97
	José F. Vega and Kurt P. Spindler	

13	Health Measurement Development and Interpretation	.....	111
	Andrew Firth, Dianne Bryant, Jacques Menetrey, and Alan Getgood		
14	How to Document a Clinical Study and Avoid Common Mistakes in Study Conduct?	.....	121
	Caroline Mouton, Laura De Girolamo, Daniel Theisen, and Romain Seil		
15	Framework for Selecting Clinical Outcomes for Clinical Trials	.....	133
	Adam J. Popchak, Andrew D. Lynch, and James J. Irrgang		
16	Advances in Measuring Patient-Reported Outcomes: Use of Item Response Theory and Computer Adaptive Tests	..	143
	Andrew D. Lynch, Adam J. Popchak, and James J. Irrgang		

Part III Basics in Statistics: Statistics Made Simple!

17	Common Statistical Tests	.....	153
	Stephan Bodkin, Joe Hart, and Brian C. Werner		
18	The Nature of Data	.....	163
	Clair Smith		
19	Does No Difference Really Mean No Difference?	.....	171
	Carola F. van Eck, Marcio Bottene Villa Albers, Andrew J. Sheean, and Freddie H. Fu		
20	Power and Sample Size	.....	185
	Stephen Lyman		
21	Visualizing Data	.....	193
	Stephen Lyman, Naomi Roselaar, and Chisa Hidaka		

Part IV Basic Toolbox for the Young Clinical Researcher

22	How to Prepare an Abstract	.....	209
	Elmar Herbst, Brian Forsythe, Avinesh Agarwalla, and Sebastian Kopf		
23	How to Make a Good Poster Presentation	.....	219
	Baris Kocaoglu, Paulo Henrique Araujo, and Carola Francisca van Eck		
24	How to Prepare a Paper Presentation?	.....	227
	Timothy Lording and Jacques Menetrey		
25	How to Write a Clinical Paper	.....	235
	Brendan Coleman		
26	How to Write a Book Chapter	.....	243
	Thomas R. Pfeiffer and Daniel Guenther		

- 27 How to Write a Winning Clinical Research Proposal?** 249
Christian Lattermann and Janey D. Whalen

- 28 How to Review a Clinical Research Paper?** 255
Neel K. Patel, Marco Yeung, Kanto Nagai, and Volker Musahl

Part V How to Perform a Clinical Study: A Case Based Approach

- 29 Level 1 Evidence: A Prospective Randomized Controlled Study** 265
Seper Ekhtiari, Raman Mundi, Vickas Khanna, and Mohit Bhandari

- 30 Level 1 Evidence: Long-Term Clinical Results** 285
Daisuke Araki and Ryosuke Kuroda

- 31 Level 2 Evidence: Prospective Cohort Study** 289
Naomi Roselaar, Niv Marom, and Robert G. Marx

- 32 Level III Evidence: A Case-Control Study** 295
Andrew D. Lynch, Adam J. Popchak, and James J. Irrgang

- 33 Level 4 Evidence: Clinical Case Series** 301
Mitchell I. Kennedy and Robert F. LaPrade

- 34 How to Perform a Clinical Study: Level 4 Evidence—Case Report** 307
Andrew J. Sheean, Gregory V. Gasbarro, Nasef M. N. Abedelatif, and Volker Musahl

- 35 Level 5: Evidence** 313
Seán Mc Auliffe and Pieter D’Hooghe

Part VI How to Perform a Review Article?

- 36 Type of Review and How to Get Started** 323
Matthew Skelly, Andrew Duong, Nicole Simunovic, and Olufemi R. Ayeni

Part VII How to Perform a Systematic Review or Meta-analysis?

- 37 What Is the Difference Between a Systematic Review and a Meta-analysis?** 331
Shakib Akhter, Thierry Pauyo, and Moin Khan

- 38 Reliability Studies and Surveys** 343
Kelsey L. Wise, Brandon J. Kelly, Michael L. Knudsen, and Jeffrey A. Macalena

- 39 Registries** 359
R. Kyle Martin, Andreas Persson, Håvard Visnes, and Lars Engebretsen

Part VIII How to Perform an Economic Health Care Study?

- 40 How to Perform an Economic Healthcare Study** 373
Jonathan Edgington, Xander Kerman, Lewis Shi, and
Jason L. Koh

Part IX Multi-Center Study: How to Pull It Off?

- 41 Conducting Multicenter Cohort Studies:
Lessons from MOON** 383
José F. Vega and Kurt P. Spindler
- 42 MARS: The Why and How of It** 391
Rick W. Wright, Amanda K. Haas, and Laura J. Huston
- 43 Multicenter Study: How to Pull It Off? The PIVOT Trial** 403
Eleonor Svantesson, Eric Hamrin Senorski, Alicia Oostdyk,
Yuichi Hoshino, Kristian Samuelsson, and Volker Musahl
- 44 Conducting a Multicenter Trial: Learning from the
JUPITER (Justifying Patellar Instability Treatment
by Early Results) Experience** 415
Jason L. Koh, Shital Parikh, Beth Shubin Stein,
and The JUPITER Group
- 45 How to Organise an International Register in Compliance
with the European GDPR: Walking in the Footsteps
of the PAMI Project (Paediatric ACL Monitoring Initiative)** 427
Daniel Theisen, Håvard Moksnes, Cyrille Hardy,
Lars Engebretsen, and Romain Seil

Part X Helpful Further Information

- 46 Common Scales and Checklists in Sports Medicine Research** 437
Alberto Grassi, Luca Macchiarola, Marco Casali,
Ilaria Cucurnia, and Stefano Zaffagnini
- 47 A Practical Guide to Writing (and Understanding)
a Scientific Paper: Meta-Analyses** 471
Alberto Grassi, Riccardo Compagnoni, Kristian Samuelsson,
Pietro Randelli, Corrado Bait, and Stefano Zaffagnini
- 48 A Practical Guide to Writing (and Understanding)
a Scientific Paper: Clinical Studies** 499
Riccardo Compagnoni, Alberto Grassi, Stefano Zaffagnini,
Corrado Bait, Kristian Samuelsson, Alessandra Menon, and
Pietro Randelli
- 49 Reporting Complications in Orthopaedic Trials** 507
S. Goldhahn, Norimasa Nakamura, and J. Goldhahn

50	Understanding and Addressing Regulatory Concerns in Research	515
	Jason L. Koh, Denise Gottfried, Daniel R. Lee, and Sandra Navarrete	
51	What Is Needed to Make Collaboration Work?	533
	Richard E. Debski and Gerald A. Ferrer	
52	A Clinical Practice Guideline	537
	Aleksei Dingel, Jayson Murray, James Carey, Deborah Cummins, and Kevin Shea	
53	How to Navigate a Scientific Meeting and Make It Worthwhile? A Guide for Young Orthopedic Surgeons	551
	Darren de SA, Jayson Lian, Conor I. Murphy, Ravi Vaswani, and Volker Musahl	
54	How to Write a Scientific Article	561
	Lukas B. Moser and Michael T. Hirschmann	
55	Common Mistakes in Manuscript Writing and How to Avoid Them	579
	Eleonor Svantesson, Eric Hamrin Senorski, Kristian Samuelsson, and Jón Karlsson	