How NOT to Write a Medical Paper

A Practical Guide

Markus K. Heinemann

Thieme

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This book must be dedicated to my two teachers in editing:
Hans Georg Borst, who dissected my early publishing efforts word by word with a freshly sharpened pencil (those were the days), and who is the one (and only) world expert on serum asphalt,
and
Hank Edmunds, who taught me all about editing and remains an invaluable source of advice.
Thank you both for your continued support!

Contents

1

Introduction

"Why yet another book on medical writing?" you may ask. The answer is: to provide the reader and potential writer with a short but comprehensive practical manual similar to a travel guide of the modern kind which tells you how to reach Hampi, the secret Indian village, rather than indulging in the art historical details of its Vijayanagar remains.

This last sentence is too long. For a scientific article. Simple as that.

As an Editor-in-Chief of a scientific journal, *The Thoracic and Cardiovascular Surgeon* (*ThCVS*), I read manuscripts every day: good ones, bad ones, mediocre ones. The flaws and mistakes as seen from the editorial angle, not the scientific one, repeat themselves also on a daily basis. Several of them are quite obvious, if one had only thought of them beforehand. Others are made because of common misconceptions. Some are made on purpose.

Many a famous literary writer has reflected in retrospect on what it takes to write a good novel: Vladimir Nabokov and Stephen King, for instance, to name only two.[1,2] There

is also a book with the highly original title "How Not to Write a Novel," in which the authors focus on 200 classic mistakes and how one can possibly avoid them.[3] This last volume, especially, was an important inspiration for the pages in front of you. Numerous quotes from everyday life serve as practical examples. Like in newspaper reports, names have been changed to protect the people involved, but essential features of bad (and some good) incidents have been retained.

According to Nabokov, "there are three points of view from which a writer can be considered: he may be considered as a storyteller, as a teacher, and as an enchanter. A major writer combines these three—storyteller, teacher, enchanter—but it is the enchanter in him that predominates and makes him a major writer."[1] In scientific writing, there is no space for storytelling and little for enchantment. One could, however, say that a good scientific author is also a good teacher, ideally telling the reader everything essential about the subject and doing this in a very professional but also understandable way. This guide is designed in a step-by-step, exemplary fashion. Close adherence to the advice given should bring you one big step closer to the desired acceptance letter. Nothing can be guaranteed, of course. The scientific content should be rock solid by nature if a proper study design has been followed. Yet, writing and publishing remain very humane endeavours in parts and are therefore prone to inconsistencies. Don't say you have not been warned.

2

Why Editors Accept/Reject Manuscripts

In 2001, Georges Bordage from the Department of Medical Education, University of Illinois at Chicago, USA, published an article called "Reasons reviewers reject and accept manuscripts: the strengths and weaknesses in medical education reports."[4] For this, he analysed 151 reviewers' comments on research articles, 123 of which were primarily critical and 28 positive. He concluded that some mistakes can be fixed in a revision but that there are also many fatal flaws ("ignoring the literature, designing poor studies, choosing inappropriate instruments, and writing poor manuscripts").

According to this analysis, the top 10 reasons why reviewers and editors reject manuscripts are:

1. Inappropriate, incomplete, or insufficiently described statistics
2. Overinterpretation of results
3. Sample too small or biased
4. Text difficult to follow/understand

5. Insufficient/incomplete problem statement
6. Inaccurate/inconsistent data reported
7. Inadequate review of literature
8. Insufficient data presented
9. Defective tables/figures
10. Unimportant/irrelevant topic

The list extends to 20 items. On the other hand, there were only nine criteria for a positive vote:

1. Important, timely, relevant, critical, prevalent problem
2. Well-written manuscript (clear, easy to follow)
3. Well-designed study (appropriate design)
4. Thoughtful, focused, up-to-date literature review
5. Sample size sufficiently large
6. Practical, useful implications
7. Limitations of study acknowledged
8. Problem well stated, formulated
9. Novel, unique approach to data analysis

I would like to add a 10th reason why editors accept papers:

10. Because they can.

This reason number 10 for acceptance is, of course, also valid for rejections. Editors-in-Chief have the power to finally decide because they also bear the responsibility for the content of the journal. It nevertheless helps to ask oneself as an author how many of the nine positive criteria listed above one's research really fits, and if any of the

negative characteristics can be amended. As it is natural for investigators to believe in their own studies, they may be blinded to potential shortcomings. A process called "peer review" supposedly takes care of that by giving the editor information as neutral as possible about the paper. For this, reviewers who are familiar with the reported research field and who should be unbiased against the authors are selected. In order to alleviate this, some journals follow a double-blinded review process, meaning that the reviewer does not know who the authors are and vice versa.

Ideally, the reviewers will dissect the manuscript with respect to all the aspects listed earlier and give the editor their opinion: accept, revise, reject. First-hand acceptance is a rarity. Rejection is unfortunately the most common primary decision, mainly for several of the reasons listed before. If a paper is not a clear-cut case for rejection, the peers will often detect room for improvement and recommend a revision—which they usually get to see again to judge if their questions have been answered and their suggestions followed (see Chapter 5). This process will be repeated when reviewers are still dissatisfied, and so the whole act may become quite tedious. At the end, there is the final yes/no decision by the editors—which they make because they can.

Editors do by no means feel obliged to accept papers just because the abstract has been presented at a congress, even if a mandatory manuscript submission to their journal

was required at the time of the presentation.[5] Conversely, detailed articles may belie the content of an enthusiastic talk or poster, which by nature has to be somewhat superficial.

3

Types of Scientific Articles

3.1 Original Article

An original (or research) article is the most common form of scientific publication. It is considered a primary source of knowledge, meaning it is written by the people who actually did the research. The reported results of an original study are put into the context of the already existing body of knowledge, adding to it. A peer-review process is to ensure that the content is sound and reproducible. It should be published by a so-called scholarly journal, which fulfils certain objective criteria to allow for a high standard of quality.

Such a manuscript usually contains the following features: Abstract/Introduction/Methodology/Results/Discussion/Conclusion/References (see Chapter 4).

This may vary between journals but is well defined in the respective Instructions-for-Authors. When reporting a randomized controlled trial (RCT), there are minimum recommendations for evidence-based studies to be found under: www.consort-statement.org. This "CONSORT

Statement" (Consolidated Standards of Reporting Trials) is endorsed by many journals. It contains both a helpful checklist and a flow diagram.

A *prospective study* is planned before any data are collected and follows a strict protocol. Many human drug trials and experimental animal studies are conducted this way. In a *retrospective study*, data already recorded are analyzed, meaning that the study is designed after (or during) data collection when a particular question becomes of interest. This is very common in the surgical disciplines. Adequate statistical models help to enhance the validity. An *observational study* is more of a describing nature and thus, less judgemental.

3.2 Meta-Analysis

A meta-analysis is considered a secondary source combining the results from different studies looking for identical patterns or lack thereof. Because of the addition of several papers, the overall numbers increase, which in turn should enhance the statistical power. Specific statistical techniques are used to integrate the results of the included studies. Again, there are commonly agreed upon standards which are summarized as the PRISMA Guidelines (Preferred Reporting Items for Systematic Reviews and Meta-Analyses): www.prisma-statement.org. They include a 27-item checklist and a 4-phase flow diagram guiding potential authors through a methodologically correct set-up. The required features are: Problem Formulation/

Literature Research and Selection/Analysis (Model)/ Results/Discussion/Conclusion/References.

Following the standardized procedure, the results comparing the various studies are commonly depicted in a Forest plot (**Fig. 3.1**). This gives the reader a visual impression of the result distribution of the analyzed studies (arrangement with respect to the "line of no effect") as well as their potential impact (size of symbol according to number of items reported).[6]

Bad Example (scenario):

Merkel et al published study A with 134 patients investigated between 2007 and 2010. Some years later, they publish their grown experience in study B. This one comprises 186 patients investigated between 2007 and 2012.

It is wrong to add the numbers of A and B to 320 for a combined analysis, because study B contains the patients from study A, adding only 52 new ones from 2011 and 2012. This may not always be so obvious because of changes in journals and author names.

3.3 Review Article

Also sometimes called a systematic review, this is again a secondary source with the intent to give a thorough overview of a well-defined subject or research question. For this, it analyzes and summarizes the current literature, utilizing explicit and systematic methods for selection.

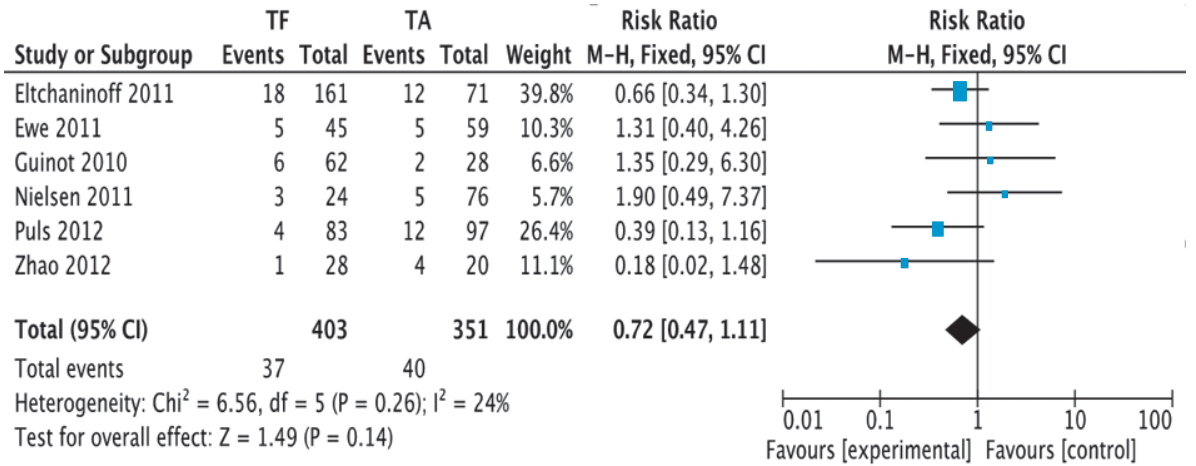

Fig. 3.1 Left: studies analyzed in alphabetical order with relevant data. Right: graph with vertical "line of no effect." The power of the individual studies is represented by the size of the respective symbols.
(Liu Z, He R, Wu C, Xia Y. Transfemoral versus transapical aortic implantation for aortic stenosis based on no significant difference in logistic EuroSCORE:A Meta-Analysis. Thorac Cardiovasc Surg 2015;63: http://dx.doi.org/10.1055/s-0035-1555606.)

Principally, it is very much like a meta-analysis but without the statistical part. The PRISMA guidelines should be followed accordingly. Its purpose is to inform the readers about a state-of-the-art situation, relieving them from having to read a multitude of studies. Therefore, review articles are generally highly cited.

Many journals accept submission of review articles by invitation only. Most of the time, authoritative authors are invited, who may or may not add their own experience. In print journals, systematic reviews generate the leading articles of an issue supposed to catch the eye.

3.4 How-to-Do-It

This is a favourite of the surgical community, and is supposed to teach the reader a method. Typically, a how-to-do-it dwells heavily on the description of a technique and thus depends, for a good part, on high-quality illustrations or videos. The accompanying text is short and the number of references limited.

The method described must be one established by the authors in more than one case (see section 3.5). After all, a How-to-do-it means that the procedure can be reproduced by the reader in a similar situation and that it is therefore reliable. Not surprisingly, these articles are often controversial and vividly discussed in Letters-to-the-Editor (see section 3.6).

The common features are: Introduction/Technique Description/Discussion.

3.5 Case Report

Another favourite in surgery, but also found in almost all other clinical disciplines, a case report is a short summary of a more or less spectacular treatment. Commonly, it is a demonstration of pride, telling how one handled a particularly tricky case successfully. Case reports with negative outcomes can be at least as exciting, if not more so, but may have unpredictable legal repercussions. It is, however, true that good experience often comes from bad experience and unwritten case reports have certainly led to repetitions of fatal mistakes.

Because the effort to write such a short manuscript is modest, and the literature to be read scarce by nature, case reports are often beginners' papers, ideally suited to learn the crafts of the trade and to get one's name in print. Editors know that they are often read but rarely cited and may negatively influence the impact factor of their journal (see section 7.2). Nevertheless, case reports constitute an important part of medical knowledge distribution.

With the reported patient being identifiable, just because of the described unique medical details, obtaining a written permit to publish these highly specific private data is advised and required by most journals.

The common features are: Introduction/Case Description/Discussion.

3.6 Letter-to-the-Editor

Did you ever get an irritating feeling when reading a paper, thinking: "This is certainly not the way this should have been done!"—especially when you had embarked on a similar research journey before? Or do you seriously doubt the adequacy of the described methods or even the results of Dr Merkel's recent study on serum asphalt levels? Then it may be the time to write a Letter-to-the-Editor.

This category is for discussion of a paper already published in a journal and can be contradictory (often) or affirmative (rarely). It is addressed to the Editor-in-Chief and should clearly state your opinion, ideally supported by a few selected references. The language must be objective and avoid emotional inklings.

Most editors will send such a letter to the original authors for a comment, which may then be published together with the letter as a reply. If a paper is highly controversial, they may wait for a couple of letters and then publish the whole discussion as a bundle. Many journals are glad when an article stimulates a debate, regarding it as a proof of their scientific topicality.

Counterproductive attitudes by ill-advised institutions may lead to a letter being counted as a full publication in their academic records, which has led to the emergence of proliferative letter writers. Professional editors will see through such a ruse easily.

4

Manuscript Components: Dos and Don'ts

4.1 Authors

Bad Example 1 (scenario):

"Lorontajev, Haas, Lauterbach, Dnjepopetrovk, Berger, Ellis, Mosbach, Pahlawi, Sokolow, Beluga, Holzhausen, Gottfried, and Black" submitted an article. This makes 13 authors for a journal considering 7 as an appropriate maximum number for an original clinical article from one institution. Editorial research revealed that an absolutely identical abstract of the article had been published in a Moldavian conference booklet the year before. Here, the authors listed were: "Lorontajev, Haas, Lauterbach, Gottfried, and Black," i.e. five in number.

It must be assumed that eight gifts were given, still leaving Gottfried and Black as heads of the two involved departments (see potential reservations below).

Bad Example 2 (letter received after acceptance notification):

"Dear Editor,
please I'd like ask to you if it's possible to add another Author (Chitario, Giuseppe), who work with us in the elaboration of the Manuscript. The name should be added following the name of the Author Stavros, Yanis. Thank you very much again.

With the best regards,"

Editor's reply:

"Dear Dr X,
adding an author after an article has been accepted for publication is very problematic. Good scientific practice means that authors of a manuscript are determined before the manuscript is actually submitted for the first time.

1. Please explain to me why the author was omitted in the first place, if there was really a significant contribution.
2. Please explain the position of this person. I have noticed that one of the co-authors bears the same surname.
3. Please provide me with an agreement that all other co-authors consent to the desired addition of the new person.

Should an agreement be reached to add this person, this will be published as an 'Erratum' to the article."

Author's reply:

"Thank you for the explanation. According to that, the mistake was made by me. Sorry!

Under these conditions, I prefer not to change the authors list anymore. So you may prepare the final version without any further changes of the authors list."

Bad Example 3:

"Zoltan Šorek[1], Jan Havel[1], Juri Vojdálek[1], Eva Čermiková[1], Radek Pudicek[1], Albert B. Speer[2]

[1]Department of Cardiac Surgery, Franz Kafka University Prague, Faculty of Medicine, Czech Republic

[2]Department of Cardiac and Vascular Surgery, Spandau University, Berlin, Germany"

Editor's comment (together with the rejection):

"As it is obvious that the study was performed at your hospital in Prague, it is hard to understand how a single German scientist can be listed as the last (!) author. In case of acceptance, this would have required a written explanation by both parties concerned.

For any future submissions, please be aware that the *Journal* strongly discourages the policy of adding so-called 'gift authors' as this actively undermines the integrity and quality of scientific publishing."

Bad Example 4 (Editor's comment):

"There are 9 authors for a case report, 6 of whom are surgeons, 2 radiologists, and (only!?) one a cardiologist. This makes one

wonder about the set-up of your heart team. Moreover, it is hard to imagine that 6 surgeons really did have a true input in a single operated case. So-called gift authorships are strongly discouraged by the *Journal*. Please correct the number of authors."

Authorships can drive editors and publishers crazy. The amount of time spent on settling discussions and disputes regarding the seemingly simple question of who actually wrote a paper means a significant reduction of their respective lifetimes.[7] Life could be so simple. Everything is written down in the ICMJE guidelines.[8]

An author is anybody who made a significant (!), active (!), intellectual (!) contribution to the content of a manuscript. Giving money, collecting data, contributing cases, and general supervising are all important but can very rarely be considered an intellectual effort. Try selling this to the head of a department. He/she often considers himself/herself of such utmost importance that without his/her simple existence the research would never have been possible—which is very often utter rubbish. Scientific publishing, however, is one big vanity fair with obsolete hierarchies still determining chiefs and Indians, even in the 21st century. There are, of course, cultural wonts. "In our country it is an undisputed requirement that the head of the department must always be the principal author" (oral statement at the 2nd Congress on Medical Writing, Ajman, UAE, 2015—speaker and country in question known

to the author). But, to be honest, vanity is a universal phenomenon.

Anybody who contributed to a manuscript but does not fulfil author criteria is called just that: a "contributor." All contributors should be listed in an Acknowledgement, which by most journals is placed between the end of the main text and the References. This is meant to ensure that nobody is forgotten and everybody can see their name in light, not necessarily the spotlight though.

It is really good scientific practice to determine authorships before the paper is actually being written in order to put honesty before hype. My personal guess is that this rule is hardly ever followed. In reality, there is a huge army of "gift authors" who are listed but did no (or at least no really intellectual) work. Much more tragic is the mass of "ghost authors," whose number is presumably at least as large but will remain unknown by nature. These are all the people who actually did work on the paper but do not appear on it. Sometimes such negligence or arrogance or ignorance leads to fierce authorship disputes after publication when a ghost finds out. If the claims are justified, the journal will publish an "Erratum" to set the record straight. This is embarrassing for the original principal author. One should not forget that a record of Errata to one's publications equals a severe damage of reputation and may lead to blacklisting among publishers.

The Committee on Publication Ethics (COPE) recommends algorithms for various problems, which can

arise during the publishing process. Six are for "Changes in Authorship" alone,[9] making it very clear that all authors must agree and that a plausible explanation is needed.

When an author has changed employment while writing a paper and then publishes old research out of the new institution, it is completely incomprehensible why the chief of the new one should appear as a co-author. This is, however, almost a regular feature to be questioned by a responsible editor.

Limiting the number of authors in the Instructions-for-Authors is a means by journals to discourage gift authorships. On the other hand, it may stimulate them. "Hey, we can have seven! Whom else do we take on, then?"

Strictly speaking, the first author should have done most of the actual work, the senior one the bulk of pre-submission editing (see Dedication, HGB). What has come into fashion lately for obvious reasons, however, is the claim that two authors "contributed equally" to the manuscript, meaning that both want to be treated as first author. This is problematic and rarely justified. Again, responsible journals require a written statement about who did what and why this accounts for equality, signed by both authors concerned as well as the senior one. If this is plausible, the request can be granted and the statement should be published as an Acknowledgement. An editor's experience, however, is that a considerable number of these claims eventually result in the determination of only one first author.

In order to overcome all these increasing authorship disputes, journals are introducing Scientific Responsibility Statements in which the individual contributions and responsibilities must be clearly defined. Although this cannot guarantee absolute truth, it is much harder to be dishonest in public.

4.2 The Admirable Art of Formulating a Comprehensive and Precise Header Preceding an Eminent Scientific Publication and Informing about Its Content: (alt.) Title

Bad Example 1 (*Journal*, modified):
"27-chlorine asphaltodeoxyglucose positron emission tomography with computerized tomography versus computerized tomography alone for the management of solitary lung nodules with diameters inferior to 2.0 cm"

Bad Example 2 (submitted to *Journal*):
Surgical Treatment Combined with NSAIDs in Asphaltosis Petrificans Progressiva

Good Example[10]:
Accidental Condom Inhalation

Everybody will agree that Bad Example 1 is just that: a bad example. You can read it several times aloud and may still wonder what it is all about. It is unduly long (205 characters). It repeatedly spells out a phrase (computerized tomography) for which a commonly accepted abbreviation is part of everyday language (CT). *ThCVS*, for instance, recommends confining the title to 95 characters. The cut-off in this example would be at "versus." Consider changing it to: "Advantages of PET-CT in the diagnosis of small solitary lung nodules." This has 68 characters and contains all the information you really need, plus it may arouse the reader's curiosity.

The second bad example, on the other hand, contains an abbreviation which, although established, is not common usage, especially not for the reader of a surgical journal.

In general, a title should be of adequate length, avoid complicated wording and abbreviations, adhere to a journal's requirements (if existent), and give an idea of the study reported, containing the relevant information about it. It can be phrased either topic-focussed (What is it about?) or result-focussed (What did we find?).

Hypothetical good examples would be:

"Tricuspid valve repair through a left postero-lateral thoracotomy" (topic-focussed), or

"High serum asphalt levels extend the safe myocardial ischemic time" (result-focussed).

Both condense their content into a few words and follow the journalistic advice that a headline should be

attracting rather than explaining. Bad: "Decision to acquire German Audi cars for the business fleet of Zhu Electronics made by honourable chairman Dao-ling Zhu." Good: "Zhu buys Audi." The pun here is not necessarily intended but inherent. It can be alright to be witty, but this does require excellent writing skills as well as a thorough knowledge of the audience addressed. As a rule, editors discourage wit in a scientific manuscript.

Although a scientific journal is not a tabloid newspaper, its authors still want to be read. This is why the good example at the beginning is so brilliant in its brevity.[10] Everybody will look this one up in Medline.

4.3 Abstract and Keywords

4.3.1 Abstract

It is absolutely essential that you get your Abstract right. It may be the only part of your manuscript ever read. For high-volume journals such as the *British Medical Journal*, it is estimated that an initial decision is made on the abstract alone in 15 to 25% of all submitted manuscripts. This means that by looking at a very small part, editorial staff directs an article to further peer review or into the electronic dustbin, which is called an "immediate rejection." Most journals nowadays require a structured abstract with a word limit to be closely observed (*ThCVS*: 250). The structure often follows the basic set-up of a scientific paper, for example: Background/Methods/Results/Conclusions. This may seduce the author to cut and paste from it—which is

tempting, but almost certainly a big mistake. The purpose of an abstract is to concisely inform rather than to merely repeat content.

An idealized abstract starts with a one- to two-sentence message about the hypothesis, followed by rather brief method and results summaries containing (only!) the relevant data. The discussion part is usually to be avoided to lead directly to the conclusions, which must sum up the essential, catching message the authors want to convey. Accordingly, everything must be specially phrased to condense.

At the end of the paragraph you are currently reading, section 4.3 will have a word count of exactly 250 words so far. This is not really much but enough to impart a lot of essential information.

(Your 250 word limit has just ended above!)

An astonishingly common mistake is a mismatch of numbers between the abstract and the main text. If you announce a study involving 247 (143 vs. 144) patients in the abstract, the method section should not contain 249 (145 vs. 144). If the conclusion of the abstract is that "High serum asphalt levels extend the safe myocardial ischemic time," the reader will be confused if he reads in the conclusion section of the paper that: "in patients with high serum asphalt levels there seemed to be a tendency towards extended ischemic tolerance. Further studies are necessary to investigate this in more detail." Apart from the fact that these latter conclusions are rather bad ones

(see section 4.8), they are not consistent with what was announced originally.

Even in the era of steadily increasing Open Access publishing, many subscription-based journals still have an embargo period before an article becomes fully available. Until that time point, usually 6 to 12 months after original publication, the abstract remains the only part visible to everybody through PubMed, Scopus, or other search engines and databases. It is therefore of utmost importance that its content is correct and that the reader is able to form an opinion if the full text is of further interest or not. Consider the abstract to be a packed version of the paper, not an extraction. It should be concise and interesting. A good test is to ask a colleague to read it and as a result to sum up for you what your study was all about in his/her opinion. Hopefully, there will be a lot of consensus. If not, rephrasing seems to be urgently required.

4.3.2 Keywords

Together with the abstract, most journals also demand to make a selection of keywords, commonly offering a list to choose them from. These terms help to categorize a manuscript, to find appropriate reviewers, etc. If such a list is available, keywords should not be made up by the authors but taken from it, because publishers often utilize universally agreed upon Medical Subject Headings (MeSH), also used by the databases where the published article is registered later (see section 7.2).

4.4 Introduction

Bad First Sentences:

"In the context of myocardial ischemia elevated serum asphalt levels may play a protective role because of their assumed radical-binding properties observed in workers who suffered from myocardial infarction during motorway building. In order to investigate this potential effect, 247 patients were retrospectively analyzed regarding their serum asphalt level in relation to the postoperative Troponin I and CK/CK-MB levels as well as ischemic ECG changes."

Good First Sentence:

"This retrospective study investigated the assumed protective effect of high serum asphalt levels on myocardial ischemia."

Whereas in the bad example the authors start telling a lengthy story, the good example expresses a hypothesis, namely that asphalt is good for you. The Introduction is supposed to lead from the general to the specific: "Where do we come from? Where do we want to go?"

It is important to focus it on the target audience. Readers of a more general medical journal are not expected to be intimately familiar with the research subject, whereas broad explanations will bore the expert. The last sentence of the introduction should clearly delineate the purpose of the study.

To provide the background and to illustrate the big picture, only the most relevant literature must be cited here. This serves as a justification for the further research which is about to be presented and which ideally does fill a gap. The actual study design used (e.g., pro- versus retrospective) is to be mentioned only briefly and should neither substitute nor replicate the Materials and Methods.

Whereas the expectations one had at the outset are an important part of the introduction, it may be premature to mention the results at this stage. Journals handle this differently. A discerning Editor will let you know if he/she did not like the way you wrote it. What is essential, however, is a clear message why this research adds to our existing knowledge regardless of the eventual results. Avoid "Hen-and-Egg" argumentations. They are common but tricky. Technically, the introduction also offers a perfect opportunity to introduce any abbreviations which will crop up again throughout the text—just think of the "NSAIDs" above.

To draw another parallel to literature: the importance of a first sentence must not be underestimated. Take: "All heart surgeons are bastards, and Conway is no exception."[11] This is how Michael Crichton's first novel, "A Case of Need," starts, still published under the nom de plume of Jeffery Hudson. Being of that profession and feeling debunked, I simply had to buy the book.

4.5 Materials and Methods (M&M)

4.5.1 General

Bad Example 1:

"Question: Does a high serum asphalt level extend safe myocardial ischemic time?"

Remarks of a critical reviewer:

"To answer this question correctly, it would be necessary to test *prospectively*, i.e. first the serum asphalt levels (SAL), grouping patients to (A) normal and (B) elevated, and then to see whether the latter patients have extended ischemic times (EIT). EIT is then the target parameter or endpoint. This design would enable a *multivariate analysis* (MANOVA). In the way the authors did the investigation, it is merely a *post hoc* observation of a *coincidence* of elevated SAL and EIT."

Editor's thoughts:

"They might just as well have found that brown-eyed patients rather than blue-eyed ones have EIT. Which may actually be true ...."

Bad Example 2 (Editor's comment):

"The *Journal* strongly discourages the so-called salami publishing policy in which a patient cohort is split into several small ones to increase the amount but not the quality of publications."

Materials and Methods are a vitally important part of the manuscript, although it may be the most boring to write—and to read for that matter.

In an experimental study, the information given here must enable the reader to repeat the experiments and therefore to check if the reported results are reproducible. Precise detail of any technical specifications, substances, preparations, quantities, equipment, etc., is essential.

In the "Breaking Bad" TV series, Walter White did not supply his accomplice Jesse Pinkman with an M&M record. This is why the product Jesse cooked on his own at first turned out to be a blurred rather than a translucent blue and was of inferior quality. If the set-up has been described before, as is common in laboratory study series, it may be referred to ("… has been described in detail before"[7]). Ideally, this has been done recently in the identical or a very similar journal to render this reference easily accessible. If not, it should be briefly repeated. Clinical and especially surgical studies may differ in this respect because their conditions may not be so well definable. In surgery, the senior surgeon is responsible for the surgical detail reported. Because the actual writer of a manuscript is often a surgeon in training, virtually incapable of performing a reported technique personally, this is vital for credibility.

In any case, the study design must be described in sufficient detail including sample/group sizes and the statistical methods employed (see section 4.5.2).

Particularly in clinical long-term follow-up studies comparability may become a problem.

Bad Example 2 (Editor's comment):

"Both reviewers have serious concerns regarding the arbitrary selection of the study groups. It is a general problem with retrospective studies in which groups are defined according to different time spans that their (statistical) validity is extremely limited."

Bad Example 3 (Editor's comment, rejection without review):

"It seems that you have developed an index from comparing pts with asphaltosis to those without but also being admitted to your hospital due to other chest lesions. Not surprisingly the asphaltosis pts showed clinical features common in this group. Equally not surprisingly your index showed a good correlation with the development of asphaltosis. This is a bit like comparing apples with oranges and finding that oranges were more likely to have an orange colour."

Anybody will tell you that your study should be prospective, randomized, comprising several thousand items per compared group, and that anything else will just not do. Clinical reality is rather different and so is life. The famous example is that there are no randomized controlled trials (RCT) to prove that the wearers of parachutes have superior survival compared to those without when jumping out of

an airplane. The standing of RCTs is a matter of constant discussion. Whereas the propagators state that "If you find that a study was not randomized, we'd suggest that you stop reading and go to the next article,"[12] others are more cautious: "The popular belief that only randomized, controlled trials produce trustworthy results and that all observational studies are misleading does a disservice to patient care, clinical investigation, and the education of health care professionals."[13] The medical specialty involved plays a very important role for the set-up of a study. RCTs are much rarer in the surgical community for obvious reasons. Surgery is almost impossible to be standardized and remains a highly individual art.

Nevertheless, a purely retrospective view is usually pointless. Good research poses a question, which has been vexing the authors, and tries to find the appropriate method to answer it. This makes much more sense than saying: "We have two-and-a-half-thousand coronary patients here. Let's see if any of them had low serum asphalt levels (or blue eyes, or whatever)." A statement like "26 perioperative factors, serum levels of asphalt and other substances, were statistically analyzed in 98 patients" may have been phrased to sound impressive, but is completely inane. As so often in life, compromise may be the answer. Rather than "retrospectively analyzing all patients receiving a Ross-procedure between 1998 and 2014 regarding their risk-factors for developing early neo-aortic valve insufficiency," it is much more sound

to “investigate our Ross-population for neo-aortic valve insufficiency. Patients with asphalt-impregnation were compared to matched controls regarding durability.” Still not brilliant, but definitely much more meaningful.

The study population is to be exactly defined: “287 consecutive patients undergoing elective triple coronary artery bypass surgery with good left ventricular function” or: “For a matched pair analysis 123 subjects receiving only arterial bypass grafts were compared to a matched group of 123 with venous grafts only.” Reasons for exclusion must be given. (“In this study on Y-linked genome abnormalities we excluded females because they do not have a Y-chromosome.”)

In clinical studies, something is done to the patients, usually with the intention to find a better treatment modality. Whenever new approaches are introduced, non-inferiority must be documented as early as possible to minimize potential harm. The new method must at least be equally as good as the old one. Ethical approval must be obtained beforehand and elaborate study protocols followed. All this is part of the M&M section. Naming the involved ethics institution is essential, including the approval number or similar. In one of the biggest retraction waves for scientific misconduct ever, a series of papers named an Institutional Review Board (IRB), which simply did not exist in this form.

In truly novel therapies, the modalities of obtaining the patients' informed consent are also important. The normal informed consent form for the treatment does not suffice. In Case Reports, the identity of the patient may be guessed because of the reported uniqueness of the findings (see section 3.5). Here, an explicit written permission to publish by the individual is mandatory.

Very Bad Example (Editor's immediate rejection comment):

"The manuscript cannot undergo a peer review process in its current form and has to be rejected. This is for the following reason:

As the use of carbolic acid is extremely restricted and regulated throughout most countries in the so-called Western world because of its severe toxicity I see no justification for this paper. The statement that this treatment had IRB approval amazes me and original documents would be needed to support this."

Bad, Non-Credible Example:

"The present study was approved by the ethics committee of XY Hospital, and written informed consent was obtained from the patients. We recruited 40 patients who developed hypoxemia within 24 h of extubation after undergoing surgery for mitral valve insufficiency."

Bad Example 4 (Editor's comment):

"The statement: 'were randomly divided into 2 groups after obtaining their consent forms' is totally insufficient. You must provide us with:

1. a detailed description of the randomization process.
2. The way this study was undertaken requires a study protocol with a specific informed consent. Please provide us with an original consent form, signed by a participant.
3. We also need a copy of the ethics committee's vote.

Should you be unable to provide us with documents 2&3 within the next 5 days, I must ask you to withdraw your manuscript."

The Materials and Methods section should definitely not contain parts of the results or even an evaluation by the investigators. Neutral as it is to be phrased, it must also not be a mere copy of a lab book.

When reporting about patients, it is more appropriate to name this section "Patients and Methods," because hopefully they are not regarded as material but as the human beings they are. Moreover, the term "Experimental Group" is very unfortunate and presumably incorrect when dealing with humans.

4.5.2 Statistics

Bad Example 1:

"Objective: To study the relationship between heart rate and failure of biological valve, and whether slowing the heart rate could delay the failure of biological valve. Methods: Retrospective analysis of 42 biological valve replacement cases during the period of 2006–2009. The follow-up was carried out by the outpatient service, telephone, and letter. The patients were divided into two groups based on heart rate: Group A: basic heart rate less than 75 beats per minute; Group B: basic heart rate greater than 75 beats per minute. Blood pressure, heart function, echocardiogram and reoperation rate were evaluated …"

Editor's comment (immediate rejection):

"Although you call this a 'preliminary study' I regret to tell you that the methodology is insufficient. Questions like this can only be answered by performing a multivariate risk-factor analysis. Furthermore a power analysis about minimum group size would have to be performed. Your cohort meets neither criterion."

To sufficiently delineate the pitfalls of the use of statistics, a separate book is needed. This would have to be written by a different author, not by someone who has always been fonder of words than of numbers. A comprehensive guide, which has reached seminal character and to which

the reader is referred to, is Tom Lang's "How to Report Statistics in Medicine."[14] The SAMPL guidelines are a brief but helpful tool.[15]

Here, only a few subjectively selected hints can be given.

In order to plan a study appropriately, a power analysis is advisable, estimating the rough number of samples needed for a meaningful result. Each statistical test features some basic assumptions to be met. For determination of the tests appropriate for the analysis, it should, for instance, be known if a normal data distribution is likely, if you need a one-tailed or a two-tailed test, and which alpha (significance) level is aimed at, usually meaning that a *p*-value of 0.05 is considered significant.

The all-important *p*-value expresses a probability, meaning that if you have one of 0.05 there is a probability of 95% or larger for the observed data to reject the given null hypothesis—which is generally taken as being a highly significant result. For instance, your study investigated if a high serum asphalt level has a beneficial effect on myocardial preservation and revealed a *p*-value of 0.05. This value means that even if serum asphalt had no effect (null hypothesis) you would still get the observed difference or more with a likelihood of 5% because of random sampling error. If the *p*-value would be 0.03, you would get it only in 3%, making the difference more significant, and so forth.

Strictly speaking, it tells you how (un)likely it is for your null hypothesis to be true (serum asphalt has no effect). It is not really a measure supporting your alternative hypothesis (serum asphalt is protective). Get it? This short explanation has a high probability of being mathematically incorrect. For those interested in the real theory behind the *p*-value and common misconceptions associated with it, there is a wealth of very sophisticated and challenging literature. [16, 17]

If you are a clinician, no matter what your statistics reveal, please remember: do not confuse statistical significance with clinical relevance!

Bad Example 2 (thorough reviewer):

"The authors frequently use the word 'trend' to denote results which are not significant, but with p values close to significance. This is a frequently observed imprecise language use in scientific literature. In reality, there is no such thing as a "trend" in statistics: a result is either significant or not, and has to be denoted accordingly. Scientists should aim for precision in their language as much as possible."

In case of a randomization, the method is to be stated, for instance, random number tables or computer-generated randomization. The same is true for the statistical software program used, including its version.

Good and Brief Example:

"In a randomized cross-over design utilizing the Bingo randomizer all data were entered and analyzed with SPSS (Statistical Package for the Social Sciences, version 23, 2015; IBM, Armonk, NY, USA). 95% confidence intervals were calculated with a confidence interval analysis."

The statistical tests used and the reasons for choosing them are to follow next. For your usual question, there is a limited choice of tests available, the basic principles of which are generally well known and need no further explanation. Special needs may demand specialized tests. Many editors get wary when they read that a Hosmer–Lemeshow or a Kolmogorov–Smirnov test was applied or that the data showed a Poisson distribution of Bernoulli experiments. It is very helpful to briefly outline the principles of these more exotic measures. The reader is then well informed, more comfortable, and generally in a good mood, maybe wondering why Russians feature so prominently in this business—or French for that matter. Potential evaluator influences on the reproducibility should also be mentioned if applicable: inter- and intra-observer variations, blinding processes, double testing.

When reporting the data, overdoing it for the sake of accuracy will not do. How old is somebody who is 43.64 years old? Use mean values and standard deviations

for normally distributed values only. If your standard deviation turns out to be above 50%, it simply means that you are not dealing with a normal distribution.

The world of mathematics is full of wonders and intricacies are often hidden to those of a medical profession. It is, therefore, not embarrassing but more of a requirement to consult a statistician. This should be done as part of the study design. These trained specialists are not to be abused to make sense of, or create dubious associations from a pool of more or less randomly assembled data. Statistical methods are not for creating a result but a means to get to it, and therefore an essential ingredient of research from its outset. Whenever complicated methods are used or the statistics play a meaningful, above average part in the study, the statistician becomes a co-author by nature because of the significance of the scientific contribution. Like language editing, bioinformatic services can also be bought from outside suppliers, which should then be credited accordingly.

4.6 Results

Bad Example 1:

"38% of the subjects showed an extended ischemic tolerance time of greater than 25% (30 min ± 25 min)."

Good Example:

"Elevated asphalt levels extended the ischemic tolerance time to 215 min (± 5min) which was significantly longer than in the controls (180 min ± 6 min) ($p < 0.03$)."

Bad Example 2 (Editor's comment for immediate rejection):

"You report about operations performed between 2008 and 5/2009 and find that the 'mid-term' patency rate (12 weeks!) was satisfactory.

It is now 4/2012 and reasonable follow-up data must surely be available. These would be the ones of real interest to the surgical community. Reporting short-term (12 weeks!) results three years later does not meet the criteria of scientific publishing of clinical relevance. Sorry."

Bad Example 3:

"Mean serum asphalt levels showed a significant difference between group A and group B (A 125 ± 13 pg/hl vs. 89 ± 11 pg/hl, $p < 0.05$), serum coprate levels were also significantly different (31 ± 3 pg/hl vs. 19 ± 3 pg/hl, $p < 0.05$), as were serum phosphamide levels (6.5 ± 0.3 pg/hl vs. 2.7 ± 0.2 pg/hl, $p < 0.05$) and serum cerumenate levels (67 ± 4 pg/hl vs. 41 ± 2 pg/hl), $p < 0.05$ and serum thiocyanate levels (0.09 pg/hl vs. 1.22 pg/hl, $p < 0.05$), with no significant difference found for acrylaldehyde

levels (2.4 pg/hl vs 2.2 pg/hl, p < 0.1), myoglobin kinase (345 IU vs 323 IU, p < 0.1), reduced 3,5-amino glucorylase (2657 IU vs 2894 IU, p < 0.1) and methadonesulfate levels (23.4 ± 2.3 pg/hl vs. 27.6 ± 1.8 pg/hl, p < 0.1)."

The Results section should present just that: state the findings of the study in a precise way and neutral phrasing. It is best when utilizing text, figures, and tables. If this is done, the text part must not duplicate the content of the illustrative material. It should rather present representative data and link them with supportive illustrations. A wealth of parameters and results is often best shown in a table. Endless repetitive string sentences with a lot of detailed individual data make particularly bad reading. The art of adding by subtracting can be practiced in this section.

It is important to be clear and precise, to give absolute numbers rather than mere percentages, but ideally both. The results should show that you can prove your hypothesis and not just assume it to be true. If a parameter is mentioned in the results, it must also be findable in the methods section (and vice versa).

Subjective interpretation or rating of the results is to be avoided here. This has its place in the Discussion. It is therefore very important not to mix the result part with that of the literature discussion. In summary, this section will make a rather boring reading too, but can be enhanced by the use of figures and the like.

4.6.1 Figures, Graphs, and Tables

Bad Example 1:

Fig. 4.1 depicts a bad example of a cluttered graph.

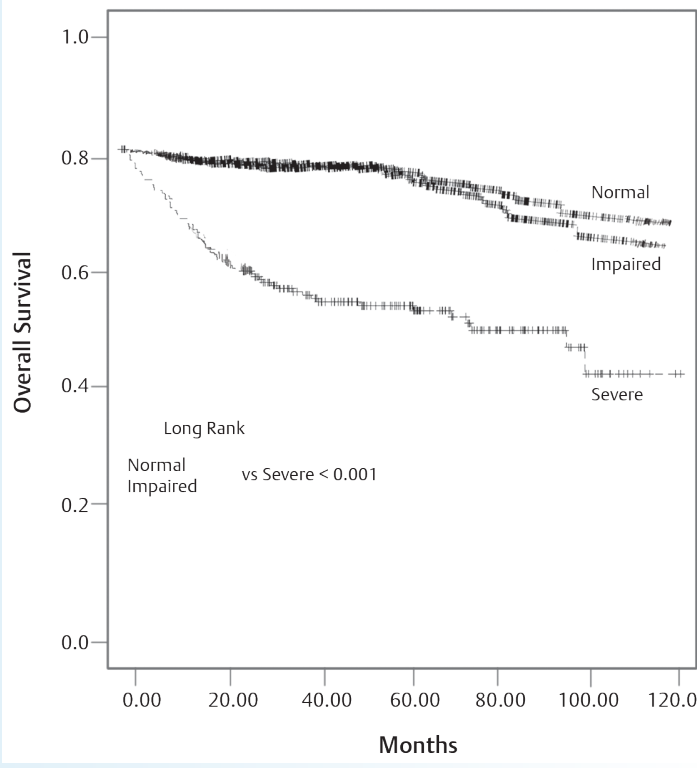

Fig. 4.1 Cluttered line graph with bad resolution. The symbols for the groups are hardly discernible (normal, impaired, severe). As this is meant to be a Kaplan-Meier analysis it should also show the numbers of the patients at risk at the individual time points.

Bad Example 2:

Fig. 4.2 depicts a bad example of a combination picture.

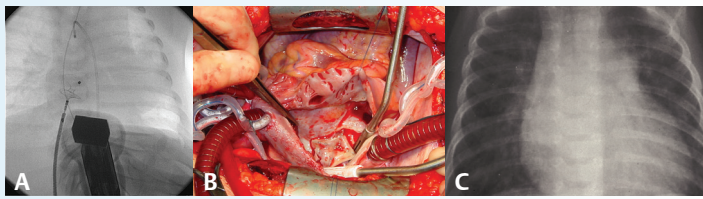

Fig. 4.2 This is a combination of three different illustrations—cardiac catheterization, intraoperative photography, and chest X-ray—two of which are in black-and-white and one in colour. They should have been submitted separately to allow for better processing and resolution.

Journals will be precise about the required formats in their Instructions-for-Authors (see section 4.11). It makes no sense to be overly creative in the assembly of tables, for instance, because they have to be adapted to the respective layout design anyway. It is more important not to overload them with too many rows and columns. Whereas a table may contain a lot more data in an article than in a visual presentation, it must still fit comfortably on one journal page in a readable font size. Anything larger is awkward to read and poses unnecessary problems for the typesetter. Tables should not be larger than one printed page.

Graphs are used to illustrate, and this is what they must do. The reader is to recognize the message behind them with one glance. As many journals are primarily reproducing graphs in black-and-white and the respective

greyscale only, clear distinctions of lines, bars, and the like are essential. Scaling must be appropriate and identical when several similar parameters are depicted separately. Down- or upscaling may distort the actual findings. Unfortunately, this can be easily abused to create a wrong impression (**Fig. 4.3 A, B**).

If a picture can say more than a thousand words, it needs to be focussed and descriptive. Not everything reproduces well in black-and-white and paying a potential fee for colour figures is often money well spent. A combination of different kinds of illustrations should be avoided. It makes no sense to combine a cardiac catheterization image with an intraoperative photography with a chest X-ray into one figure (Fig. 4.2). Each should be submitted separately to facilitate the optimal individual processing of these often quite different data formats.

If a patient runs the risk to be identified, despite anonymization measures such as black bars or similar, specific written informed consent is required.

Diagnostic images such as ultrasound, X-ray, magnetic resonance imaging, and the like should be self-explanatory and to the point. It is therefore adequate to limit distractions by formatting the picture, for instance, cutting off technical information ("cropping"). Any manipulation of the image itself is, of course, prohibited.

Every figure needs a legend, which explains what can be seen on it. Most journals require these legends to be added as a separate section in the text file, not on/in the

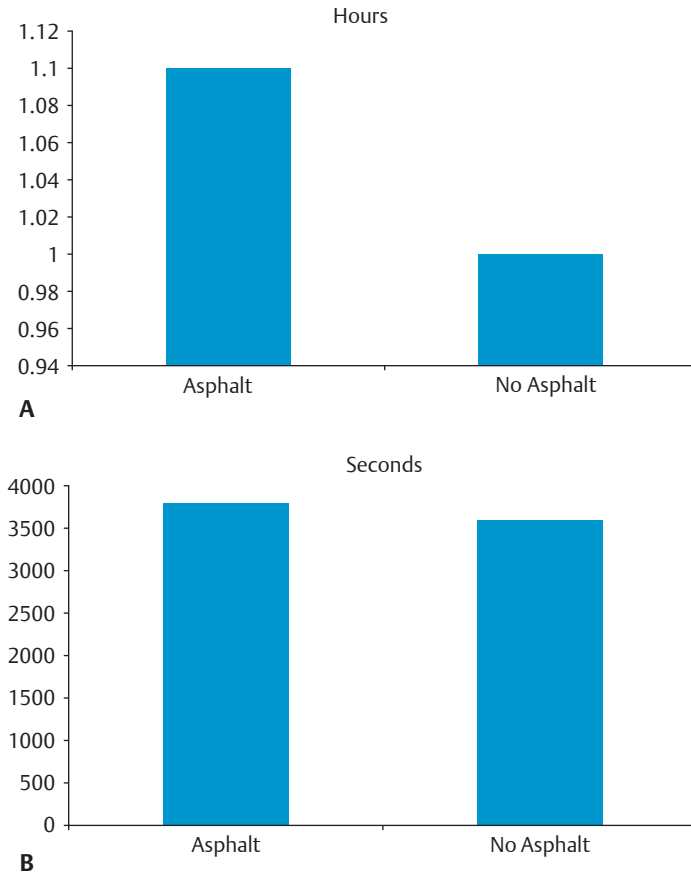

Fig. 4.3 (A and B) These figures show the same results but are depicted in different scales. **(A)** shows ischemic times with and without asphalt application in hours and with the *y*-axis starting at 0.94. **(B)** does the same in seconds with the *y*-axis starting at zero. **(A)** is suggestive for a marked difference, whereas **(B)** is not.

figure itself, and give guidelines about length and which information is needed. These Instructions-for-Authors (see section 4.11) must be closely followed.

4.7 Discussion

Bad Example 1:

"In their revolutionary article published in 2012, Merkel and co-workers already found that 'in motorway workers who suffered an acute myocardial infarction, the ischemic tolerance time is markedly extended. This can probably be explained by the elevated serum asphalt level found and the radical free-oxygen scavenging potential ascribed to it'(17)."

Good Alternative 1:

"Elevated serum asphalt levels have been considered to have an extending influence on myocardial ischemic time since 2012."(17)

Bad Example 2 (Editor's comment for immediate rejection):

"Your manuscript is a nice overview over your experience with VATS surgery for asphaltoma. Your findings, however, were completely predictable and do not add any significant news to the literature, at least not in a scientific journal. You did compare simple to complicated asphaltomas and found that the complicated ones were more complicated."

First of all, do not mix this section with the results or repeat them. While it is essential that you keep with your own data as related to the original question or hypothesis, this is the place to put them into context with the relevant literature about what is already known. The discussion should build a bridge to the Introduction in which a hypothesis was formulated. Now is the time to reflect if you did find answers and if they are in context with those found by others, or if they are contradictory. They should also be of relevance. Ideally, there is a new understanding of the investigated problem due to your research. If so, this should be clearly stated because it is the principal message of your study. It will in part be repeated in the Conclusions (see section 4.8).

To give a brief evaluation: if you reached a confirmation of known facts, it is nice, but not spectacular. If you have found new facts, they may be spectacular, but not always nice according to the world around you. If your findings are expanding the horizons of the investigated subject, every journal will love to have them. If you have a contradictory message, the discussion part is where you have to explain why you think that is. If this is not argued well, your work may be hard to publish.

The discussion is also the place to mention any drawbacks your study may have had, although some journals demand a separate section for that, called Limitations. This is meant to be honest, but if the list becomes too long, there may be concerns about validity.

As the craving for knowledge is never ending, you will very probably have developed ideas about what to do next. A short outlook should be provided, specifying the potential steps to take.

It is essential to include all the relevant and recent literature in the discussion, even if it disagrees with your actual findings. There is, however, no need to cite endlessly, least of all verbatim. This is what the reference list is for. It is much more helpful for the reader when the information of the publications is summarized briefly. Anyone interested in detail will then look them up.

4.8 Conclusions

Bad Example 1 (Editor's comment for immediate rejection):

"I hate to say this, but in a way this is an example how one should not do a study. There is no clear distinction between your groups and the numbers are far too small. Worst, there is no real difference between groups, but you still drew a conclusion."

Bad Example 2 (Editor's comment):

"The editor fully agrees with the reviewers' concerns regarding speculative conclusions. This tends to be somewhat of a problem with the surgical community."

Whereas several journals demand the Conclusions to be part of the discussion section, many want a separate paragraph. This should be relatively short and must not reiterate the discussion or even part of the methods. Basically, this is the place to state if the study did support or disprove your original hypothesis. It is tempting to assist the argumentation by introducing evidence not directly related to the topic or study, but this must be avoided. When reading the conclusions, the reader should become convinced that your findings are new, important, and valid.

Phrases in the conclusions should therefore be stating rather than surmising, avoiding statements like "looked like," "seemed to be associated with," "appeared to correlate," "might lead to," "could possibly explain," and "may be interpreted as."

Bad Example 3:

"Our randomized controlled study showed results in accordance with the assumption that elevated serum asphalt levels seem to have a protective effect on ischemic myocardium. Although the sample size was small, the uniformity of the results suggests the presence of a beneficial effect. Further research is necessary."

Good Example 1 (exaggerated):

"Asphalt is better than none."

By all means avoid the nonsensical statement that further studies are necessary. They always are. Otherwise science would have arrived at the point of total knowledge, which it never will, although Douglas Adams wants us to believe that the universal solution is 42.[18] If you cannot refrain from mentioning that the show must go on, you should at least specify the remaining issues and give the reader an idea if you will go after them yourself.

Good Example 2:
"The next analysis will investigate if elevated serum asphalt levels are found more frequently in people with brown eye colour. IRB approval for this study has been obtained in our institution."

4.9 Acknowledgments

Bad Example 1:
"Authors M.N. and O.P. both contributed equally to this work."

Bad Example 2 (Editor's comment):
"You declare 'no conflict of interest'. In your cover letter's explanation about the asphalt coating, however, you write that you are in the middle of a patent process. This is a conflict of interest par excellence. You should also mention that you cannot disclose more technical details for this reason (which is perfectly understandable). Please add all necessary information before resubmitting."

Acknowledgements are the place to credit anybody who contributed to a manuscript but does not qualify as an author (see section 4.1). This also applies to professional scientific editing and translation services, which are very helpful if there is no native English-speaker in the team. A statistical advisor or technical staff may be listed here too.

In this section, sometimes called Disclosures, authors must also declare if they received any funding for their work, be it from government agencies, official, or private sources. Grant numbers and the like are to be quoted here. The same holds good for suppliers of equipment, drugs, and other material if their contribution is substantial. Otherwise they are mentioned in the article where relevant, usually the Materials and Methods section, stating the company name and location.

In case of product-related research financed by commercial sources, most journals demand a separate "Conflict-of-Interest" statement in which detailed information about sponsoring and who-received-what is listed.

4.10 References

Bad Example 1:

"8: Ardawan JR, Thomas W, Volkmar F, et al. Does reasonable incomplete surgical revascularization affect …"

(…when anybody familiar with the scene knows that spelled out are the first names of Ardawan Rastan, Thomas Walther, and Volkmar Falk.)

The References cited should be the articles read (!) and used by the authors when designing their study as well as the most recent ones covering the topic while the research was in progress and which are then also discussed in the discussion section. Of course, they must be precise in order to enable the reader to look up the cited article. There are several formats in which reference lists can be generated. Each journal will define the one to be used in its Instructions-for-Authors (see section 4.11). Failure to adhere to this may lead to rejection for formal reasons. This is a common mistake when resubmitting a manuscript to a different journal after a rejection, not realizing that a change in format is required. Double-checking each reference is highly recommended.

On average, the cited publications should not be older than 5 to 10 years, and in basic science even younger. Although it is nice and a sign of reverence (with a "v," not an "f") to mention the historic original 1971 publication by Francois Fontan[19] on his operative technique for tricuspid atresia, it is not strictly necessary when you report about serum asphalt levels in children operated by you over the last 5 years. Should you, however, describe a new, asphalt-coated conduit replacing the homograft ones originally used by Fontan, the reference becomes necessary.

The articles cited should be relevant by definition, but they must also be accessible. It makes no sense to cite from the Chinese edition of *The Annals of Thoracic Surgery*, when most of the world reads the U.S. original. Likewise,

the *Rajasthani Journal of Asphalt Chromatography* may be listed in only very few libraries or databases outside India. Language is also an issue. Although the French will not like reading this, English has become established as the primary language of scientific communication. Fontan did in fact describe his technique in a French journal first,[20] but the *Thorax* publication given above and published four months later (May 1971 instead of January)[19] is probably much more useful for most. Nowadays, many journals in other-than-English languages will provide at least the abstract in English.

Commonly, a comprehensive literature search is performed during the planning stage of a study to define its context and to determine which citations should be dealt with in the discussion. It is advisable to do another search after completion as an update. There may have been essential articles published in the meantime and requiring attention.

Bad Example 2:

"We also make an attempt to cite seminal articles from your journal in our manuscript wherever appropriate."

Bad Example 3 (journal instructions, turning Bad Example 2 into a good one?):

"Authors are encouraged to cite previous key references from *our journal* in order to establish that their studies are well founded."

It is a sad fact that journals may actively support citations from their own archives. If followed, this may in theory positively influence their Impact Factor by increasing the number of citations (see section 7.2). Thomson Reuters has responded to this abuse by separately and very critically analysing the frequency of "self-citations" of each journal. This has already had unpleasant consequences for some editors.

4.11 Journal Instructions-for-Authors

Bad Example (boilerplate Editorial Office reply, appropriate choice to be made):

"Unfortunately, your manuscript cannot be processed any further in its current form and must therefore be rejected/unsubmitted. This is for the following formal reason(s):

- You submitted part of your manuscript in a wrong file format.
- We are unable to process any pdf or ppt files.
- Figures must ONLY be submitted as jpg or tif files.
- We are unable to read your files properly.
- You have included figures/tables within the main text. These must be submitted as separate files.
- Tables must be submitted as individual doc files."

When journals publish their Instructions-for-Authors, it is self-evident that authors are to follow them. Instructions are good when they are concise but precise, giving all

the necessary information about structure, word counts, authorship rules, figure, table, and reference formats, and more. Adhering to these guidelines will avoid what is known among editors as the "sudden death option," which means that a manuscript gets instantly rejected without any review process, simply because of formal reasons.

For instance, when the journal requires you to list all references consecutively by numbers in brackets, this is the way it must be done. One should be aware that there is a difference between brackets [] and parentheses ().

The Instructions can be found on the respective journal homepages and/or via the manuscript submission system. Another comfortable link is http://mulford.utoledo.edu/instr/. The Mulford Library of the University of Toledo, Ohio, USA, has assembled a tremendous collection of instructions for more than 6,000 journals and also gives other important links regarding publishing in the health sciences.

Following the instructions strictly is the first step to success. It saves a lot of your time and (presumably more important) that of the Editor.

5

Review Process and Corrections

Bad Example 1 (Editor's comment for immediate rejection):

"This is quite obviously a re-re-submission of ms # 1967 which was rejected after revision and a third opinion on April 1st, 2013. You then tried to re-submit it again and were rejected on May 19th, 2013. Yet again, you fail to mark if and where changes were made according to the previous reviewers' remarks—and by comparing the 3 manuscripts, I cannot see any significant changes offhand. Again, you also failed to mention that this is a re-submission. For these reasons the manuscript must be denied another review process in the *Journal*.

I have to inform you that this behaviour is considered bad scientific practice and ask you to refrain from any submissions in the future."

Bad Example 2 (Editor's comment for immediate rejection):

"You already submitted this manuscript to our Open Access sister journal a year ago with the identical cover letter. The manuscript was rejected on March 1st, 2013 after the review process (decision on manuscript # 1234).

I cannot understand why you re-submitted it again without corrections/explanations. This is an absolute waste of your and our time. Moreover it is pretty naive to assume that we would not find out. In your own interest I must strongly advise you to refrain from actions like this in the future."

Bad Example 3 (Editor's comment for unsubmission):

"In order to enable the reviewers to compare this revision to the previous manuscript, I must ask you to mark the changed passages and to provide us with a point-by-point reply to the individual suggestions—the standard procedure for a revised manuscript.

Although you stated in your cover letter that you revised your manuscript according to the reviewers' suggestions, the changes performed are not immediately apparent. As stated in the Instructions, changes should be CLEARLY MARKED to facilitate the review process."

Good Example (Editor's answer to a point-by-point rebuttal of a rejection):

"Thank you for your feedback. I know that it is always frustrating to receive a rejection after one has worked on an extensive revision. You must understand, however, that the reviewers attempt to achieve the highest possible scientific content of the *Journal*. The final decision is, of course, the Editor's, but he/she usually has to rely on the expert opinion. This is the reason for peer review (which the *Journal* does double-blinded to avoid any bias as much as possible).

I am looking forward to receiving your new manuscript. Please take your time in the interest of accuracy. You should mention the manuscript number of this one in your cover letter to the Editor when re-submitting. This helps memory and facilitates smoother processing. Again, thank you for your feedback, which I really appreciate. Usually we do not hear from authors any more after a final decision, especially when negative."

After having received a manuscript, the Editorial Office checks it for formal adequacy. If there are serious problems, it may be rejected off-hand, the so-called "sudden death option." Common reasons are unreadable files, incomprehensible language, disregard of formal requirements as stated in the Instructions, or blatant plagiarism. In case of minor flaws, many journals have an option to merely "unsubmit" a manuscript. This means that it is set back to draft status. The corresponding author

gets information on which parts of the manuscript are faulty, has the chance to correct them, and may then re-submit an amended set of files.

When a manuscript has passed the hurdle of the Editorial Office, it lands in the in-tray of the Editor-in-Chief (E-i-C). Depending on the organizational structure of the Editorial Board, the E-i-C or an Associate Editor to which it has been assigned will then select appropriate reviewers.

These "peer reviewers" are experts on the topic the manuscript is dealing with, and are recruited by scientific journals to serve as their referees. Usually, there is no remuneration and the task is done for the honour alone, a positive item in the CV, and a lukewarm thank-you by the Editor at the beginning of each year. Some publications encourage recommendations by the authors on who should review their work, but this may generate a breach of neutrality.

Actually, there is quite a lot of debate on how to avoid bias. The most common form of peer review is the "single-blinded" one, in which the reviewers do know the identity of the authors but make their comments anonymously. This, of course, can promote unobjective phrasing and targeted critique because of personal animosities—or, rarely, inappropriate adulation. Even the best-informed Editor cannot survey all the partisan feuding on the battlefield of scientific publishing. One effort to make things better is the "double-blinded" approach, in which the reviewers do not know who the authors are and vice

versa. This demands a strict anonymization process by the Editorial Office, and often cumbersome procedures within the manuscript processing system. Others favour a totally open review process with all names open to everybody.

A competent reviewer will analyze a manuscript step-by-step and write up a short report listing its drawbacks and also its assets. Ideally, well-defined advice is given on how to improve the quality and pertinent questions may be asked. For a final verdict, most journals give a choice of recommendations, for instance: accept/minor revision/major revision/reject. It is very rare that a manuscript gets accepted at first pass. Rejection, on the other hand, is the most frequent judgement, which should be well founded and also explained in detail for the authors to learn. A rejection rate of 75 to 90% is no rarity among popular journals. If the reviewers see a good chance for improvement, they can give detailed counsel and ask for a revision of the manuscript.

The Editor waits for all invited reviews to be turned in and then makes a decision. There is no fixed rule for the number of reviewers per paper, but original and review articles usually are judged by at least two people. In case of conflicting opinions, an uneven number of referees may be helpful. The decision letter contains the reviews, sometimes accompanied by an additional Editor's comment, and, in case a revision is asked for, a time frame for returning it. Authors are recommended to follow the reviewers' suggestions closely when preparing

their revision, however finicky the critique may seem. It is common practice to return revised manuscripts to the original reviewers and human for them to check if they have been taken seriously. In order to facilitate a re-review, a detailed point-by-point cover letter is considered extremely helpful by everybody, and even a compulsory requirement by some journals. If an author disagrees with a reviewer's critique, he/she should simply argue in favour of the original version and why there seems to be no need to change it.

The changes in the text must be clearly marked for easy comparison. When the Editor is under the impression that the authors did not really care, prompt rejection may be the result. The process of re-review may end in another recommendation for revision, especially if some of the questions asked remain unanswered, but a general improvement is already discernible. Thus, the whole process may become quite time-consuming for everybody and Editors must avoid unnecessary delay.

On average, most journals expect the first round of reviews for a decision to be back within 30 to 40 days after the reviewers' acceptance to their invitation. When a revision is asked for, a deadline of again about 30 to 40 days is set for the authors. If this cannot be met, the Editor must by all means be contacted before expiration to avoid rejection for technical reasons. The speed and efficacy of the review process are considered attributes for a journal's quality, at least from the authors' side.

6 Publication Ethics

Bad Example 1 (Editor's comment for immediate rejection):

"I cannot quite share your opinion that there is no ethical conflict. You got IRB approval for a retrospective analysis of your data. You also mention that all patients gave informed consent. The question is: to what? Have they been aware that they were to be subjected to an experimental treatment carrying an immunological as well as an infection risk? For this, an IRB approval would have been necessary beforehand for sure. Documentation of this is lacking and the allusion to a fiscal crisis to legitimize a change in therapy is daring, to say the least."

Bad Example 2 (Editor's comment):

"By using identical phrasing, it seems that you have used several references which are not included in your list. I must ask you to check on this and give proper credit to any reference used (including open access articles). Otherwise this constitutes an infringement of copyright laws. The articles in question are listed below:"

Bad Example 3 (Editor's comment for immediate rejection):

"Overall, the article has the appearance of a diligent copy-and-paste patchwork from multiple sources, some your own work, some definitely not. The routine use of plagiarism search engines will increasingly detect such manuscripts and lead to their rejection for formal reasons in serious journals."

Bad Example 4 (Editor's comment for immediate rejection):

"Your group has published extensively on the same subject before and to me this seems like an add-on with more patients over a longer time-span. There is a very high similarity index in CrossCheck (76%), meaning that whole passages were copied and pasted. I can provide the details, but I take it that you know them. This alone fulfils the criteria for double publication, which is not supported by the *Journal*. It also constitutes an infringement of copyright regarding previous publications in different journals."

Bad Example 5 (reviewer's comments):

"From a scientific standpoint it is rather disappointing that the authors nearly plagiarized our manuscript 'Asphalt coating of vascular grafts' published in 2012.(1) The authors just re-formatted this article and added the latest advantages of coating. Moreover, they failed to reference our paper—which is even more unscientific."

Bad Example 6 (Editor's comment for immediate rejection):

"This is basically the same study which was published by one of the co-authors in the *Other Journal* in 2011 (copy enclosed) with just a few patients more. This would represent a double publication, which is vehemently discouraged by the *Journal*.

For this reason the paper must be rejected. You should definitely not submit this somewhere else without a clear declaration that the essential results have been published before. In your submission to us you wrote that 'I would like to declare on behalf of my co-authors that the work described was original research that has not been published previously, and is not under consideration for publication elsewhere, in whole or in part.' This is simply not true."

Ethical questions are the research field of moral philosophy. Ethical action is investigated by "normative ethics," trying to answer how one ought to act by moral standards and attempting to define criteria for rightness and wrongness.

There are two principal problematic areas in scientific publishing: one is the ethical background of the research conducted, and the other one is the behavior of authors with regard to the publishing process.

In human investigations, journals require the date and file number of approval by the responsible institutional human research or ethics committee (institutional review board, IRB), normally in the Patients and Methods section. It must be indicated if specific individual consent for the

study was obtained or waived. In retrospective analyses, the IRBs often waive this need. In prospective studies, informed consent according to the relevant guidelines is mandatory and must be obtained in advance. The consent form for the treatment as such does not suffice for such trials.

Claiming ethical approval by an imaginary IRB has led to one of the largest retraction series in medical publishing in recent years. It was the consequence of a protracted investigation started by an editor involving various authorities, which finally ended several careers.

Globalization has opened the international publishing scene to virtually everybody. Editors must realize that ethical standards are completely dependent on local societies and their ideologies, resulting in considerable differences. When conflicting points of view are apparent and publication is considered nevertheless, the circumstances under which a particular study was done must be fully explained to the reader, for instance in an Editor's Comment to be published along with the article. The prerequisite is total honesty on the authors' side.

When reporting experience with a new technology or a new device, the state of the certification process in the authors' country and internationally must be given. In many journals, such articles are accompanied by a Disclaimer because of legal reasons, such as: "*The German Asphalt Society* and *The Asphalt Journal* neither endorse nor

discourage the use of the new technology described in this publication."

A disclosure statement is usually required for all studies which received financial or other aid from a commercial source. This disclosure must state all funds used to support the study, including whether used or tested technology was purchased, borrowed, or donated. In addition, all authors have to confirm that they had full control of the design and methods of the study, the data analysis, and production of the written report.

When reporting animal experiments, many journals ask for a statement confirming that all animals have received humane care, for instance, in compliance with the 1996 "Guide for the Care and Use of Laboratory Animals" as recommended by the US National Institutes of Health (see http://www.nap.edu/readingroom/books/labrats/contents.html or http://nap.edu/catalog/5140.html). Institutional approval of the protocol is also mandatory. For appropriate research conduct, authors are often referred to the ARRIVE guidelines (Animal Research: Reporting of In Vivo Experiments) which can be found at http://www.nc3rs.org.uk/page.asp?id=1357. Again, different cultures have different attitudes and should be honest about them.

Unethical behavior regarding the publishing process itself is rapidly spreading and has become a daily feature in the work of Editorial Offices. Most of it is gladly subsumed under "plagiarism," but this needs differentiation.

The term plagiarism is derived from the Latin word "plagiarius," meaning kidnapper, and is supposed to describe the wrongful appropriation of somebody else's language, thoughts, or ideas. It is often mixed up with "self-plagiarism" and "data fabrication."

"True plagiarism" means either publishing data again which have previously been published by someone else or, rarely, publishing someone else's data before he/she had a chance to do it himself/herself. Because of the steady increase of this kind of scientific misconduct, powerful commercial software has become available to the publishers, in turn raising their processing costs. Manuscripts can be entered into these systems automatically upon submission. They are then screened and a report is sent to the Editorial Office, displaying a similarity index and listing the articles with identical phrasing next to the investigated one. The results can be quite impressive and devastating.

"Self-plagiarism" is actually a bad expression as you cannot steal from yourself. What is usually meant are forms of duplicate submission without referral to a previous publication or in the form of the so-called salami slicing. The latter describes the cutting of one good dataset into many small ones, creating the challenge of the "smallest publishable unit." Real masters can produce a combination of both: manuscript 1 sent to Journal A "High asphalt levels extend ischemic tolerance"; manuscript 2 sent to Journal B "Low asphalt levels shorten ischemic tolerance." If this is done simultaneously and professionally, the search

engines may be circumvented. But do not be encouraged: you will be found out.

"Duplicate submission" as just described should not be confused with "dual submission." The latter means that a manuscript is submitted a second time while it is still in the review process of the first journal it was sent to. This is unacceptable. If authors are getting restless because they do not hear from Journal A, they must enquire about the state of affairs before re-submitting somewhere else. Only after a manuscript has been rejected it can be handed in with Journal B.

The worst is probably "data fabrication," which can be considered a criminal act. When medical actions are influenced by research data which turn out to be false, people may get hurt. Publishing history teaches us that there are different forms of data fabrication: a complete fraud means that everything has been made up. Incredible as this may seem, there unfortunately are many examples of articles, even whole series, which have been retracted for that very reason. It is often a detail which gives away the cheater: a standard deviation too good to be true, an Ethics Committee which does not exist, etc. And those are merely instances of discovered ones.

A fake matched-pair analysis is an elaborate example for partial fraud. You do have a real study group, but unfortunately you are lacking controls. Especially in a comparison with a normal population these can be made

up easily, which is very hard to find out. Of course, all deductions are invalid by definition again.

Most common is probably data polishing. Statistics and especially the standard deviations do look so much better when leaving out the outliers, claiming that they were invalid results, faulty samples, etc., and simply not counting them in. Redefining definitions is another favourite trick. When you want to show that acute asphalt poisoning is not so bad when compared to the chronic variety (which is known to have a good outcome), it is tempting to count the borderline cases into the acute group, especially and only if they did well.

"Photoshopping", named after the famous image editing software by Adobe, means the manipulation of figures to make them look better and thus more convincing.

7

Good-to-Know

For most authors, the whole thing is over as soon as they have received the letter of acceptance. This is a misconception because they still carry responsibilities and duties until the article is finally published—and beyond. After acceptance, the manuscript is entered into the production chain and undergoes a series of treatments, which turn it into the product the world is going to see. This path may contain several pitfalls, most of which will haunt the corresponding author. Their profound description would fill another book. This chapter is meant to explain a manuscript's further trail in all brevity.

7.1 The Production Chain

With the same click with which the "*Editor-in-Chief*" has sent an acceptance letter to the corresponding author, another message has been forwarded to a person called "*production editor*." This is the person who is responsible for turning a manuscript and all its attached files into a readable article with a layout pleasant to the eye. After

having gone through an electronic search program, intended to pick up major flaws in spelling, grammar, and formal issues (such as the common wrong formatting of the References), a "*copy editor*" attends to all these details, also providing language polishing if this is still offered by the publisher. The "*typesetter*" then combines all files into the actual article, standardizing text and table formats according to the general layout of the journal. Thus, a first "*proof*" is created which may still contain a number of questions by the copy editor. This proof is then returned to the "*corresponding author*" for correction and commentary where necessary. If the reply is comprehensive enough and all problems have been taken care of, a final proof is created which in turn has to be accepted by the corresponding author again. This authorized version is then sent to the Editor-in-Chief for approval (or more corrections). Only after the Editor's final thumbs-up the article is ready to be published. Many journals first do this in an online version. This renders the piece published and citable, which is what the authors have been craving for all this time, and gives the Editor more freedom in compiling an eventual later print issue. A DOI (Digital Object Identifier) number is assigned to the article. This is a character string which can specifically and uniquely identify an electronic document and has become essential for verification and citation purposes.

7.2 Indexing, Factors, and the Like

In the world of scientific publishing, an array of abbreviations and acronyms tends to confuse the newcomer. This section will briefly explain the more important ones. Others are listed in the glossary below (section 7.5).

The *Journal Impact Factor* (*JIF*, *IF*, *Impact Factor*) was originally created by Eugene Garfield of the Institute for Scientific Information (ISI) to give librarians advice on which scientific journals might be worth subscribing to. In order to assess the perception of a particular journal, a simple division was suggested: citations per citable items over the two preceding years. Meanwhile, this factor is published yearly for all journals indexed in the Journal Citation Reports (JCR), published by Thomson Reuters. It quickly gained immense popularity because of its ease of use and because it was basically the first item for metric comparison of publications. Unfortunately, with its growing own impact, it has been abused to judge the scientific output of authors and institutions. This development as well as the potential to manipulate it from a journal's side brought the Impact Factor into disregard, distinctly voiced in the San Francisco Declaration on Research Assessment (DORA).[21] For the time being, it still continues to be the most widely known and used metric system in the field. One of the more popular alternative factors which have been suggested to measure an individual's scientific output is the *h-factor* (*Hirsch factor*), which analyses the

distribution of citations over the range of a researcher's publications.

The acronym *MEDLINE* (*Medical Literature Analysis and Retrieval System Online*) stands for the bibliographic database compiled by the US National Library of Medicine (NLM). This is commonly accessed by its own search engine *PubMed*, which is freely available to everybody. Through it more than 21 million records from over 5,600 selected publications can be reached, covering medicine and associated fields from 1950 onwards. By nature it is growing daily. In subscription journals, the general public can usually only reach the abstract level within a given embargo period. Open Access articles (see section 7.4) are free for all to read.

PubMed must not be confused with *PubMedCentral* which is a full-text repository, currently archiving about 3 million such freely available articles. A *repository* can be considered a digital archive of Open Access articles, in this case deposited via the Public Access Policy by the US National Institutes of Health (NIH).

Another frequently used biomedical database is *EMBASE* (*Excerpta Medica Database*) run by Elsevier. Also maintained by the same company is *Scopus*, a bibliographic database of abstracts and citations. Its counterpart as a scientific citation indexing service, managed by Thomson Reuters again, is the *Web of Science* (*WoS*).

Last but not least, there is the omnipresent Google, here called *Google Scholar*, a web-based search engine for articles in science, technology, and medicine (*STM*).

For a comparison between the four key players—*PubMed*, *Scopus*, *Web of Science*, and *Google Scholar*— see the article by Falagas et al.[22]

CrossCheck, powered by iThenticate, is a commercial plagiarism search engine (see Chapter 6), developed from an initiative by various publishers. It is a web-based tool, which compares manuscripts to those in a growing database, already comprising over 37 million STM publications.

7.3 What Publishers Do

The production chain (see section 7.1) is a key part of what publishers actually do, but there is a lot more. Anderson, for instance, found as many as 73 things.[23] Generally speaking, they manage journals and books. For this, they provide technology such as manuscript submission systems, plagiarism search software, article production tools, and often also the printing. They manage the subscriptions, which are an essential part of their revenue. They market their products and care about distribution and financing, for instance, with advertisements.

For the individual journal, publishers help to organize think tanks such as the Editorial Office and the Editorial Board, often financing the regular board meetings which

are vitally important for further development. They also take care of the mysterious world of bibliometrics such as all the listing, indexing, the impact factor registration, and the upkeep of databases.

It is therefore deeply unjust and oversimplifying a complex field to claim that publishers are just making a lot of easy money from unpaid authors' brainwork. Without professional assistance, this mental output would never reach its intended target audience. These services cost money, even and especially in the seemingly free-for-all Open Access scene.

7.4 Open Access

Bad Example:

"Dear Dr X,

Hope you are doing great and are in good spirits.

We greatly estimate your knowledgeable research and contributions in surgery and medicine. Your published articles have contributed value to existing literature and helped to design future eminent projects. We therefore invite you to write a research article for our journal in order to improve our collaboration with eminent scientists.

Journal of Asphalt is an international Open Access peer-reviewed journal, which publishes high-quality scientific articles in various medical fields. The published articles are

listed in DAOJ, KEPLER, EBSOC and Database of Academic Journals (DAJ), thereby having acquired a 2015 Journal Factor (JF) for the journal of 3.148.

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Warm regards,

Kevin Choudhari, MSc

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Many authors may wonder what the difference between a "regular" and an "Open Access" (OA) journal is, and if the latter is worth submitting their work to.

Conventional publishing utilizes a "reader pays" model. An author submits a manuscript, and if it becomes accepted, this implies no further cost, although some journals have introduced "page fees," charging a certain amount per printed page for the work they do (see section 7.3). The publisher gets the bulk of his money from the readers, mostly through a subscription model. This means that either an individual or an institution has subscribed to the journal paying a yearly fee and that access to the content is limited to these subscribers. Articles may become freely available after an embargo period, often in the 12 months' range. Many journals favouring this model are available in both print and electronic formats.

In Open Access publishing, the author is required to pay an *Article Processing Charge* (APC), again intended to cover the production cost and earn the publisher some profit. In return, the published article is freely accessible to everybody with an internet connection in an electronic version only. This model is often described as *Gold Open Access*.

Green Open Access defines publication in institutional, self-archiving repositories, usually run by a university or funding agency. If a primary release in the Green model is intended, somebody has to provide the production and post-production, which is rarely possible. Most Green

Open Access publishing therefore happens only after the embargo period of a conventional subscription journal.

Hybrid Open Access is a business model offered by traditional publishers after an article has been accepted for a subscription journal. Authors are approached with the argument that their work can be disseminated worldwide on top of the regular journal distribution for an additional Open Access fee. This is discussed controversially with the allegation of "double-dipping" by pulling money from both the reader and the author. Financing models are currently developed by which the hybrid APCs are supposed to help bringing down subscription rates.

For a normal APC in an established OA journal, one can expect an average of US$ 1,450 for an original article from the STM community (Science, Technology, Medicine), less in the humanities and social sciences. There is a wide range from around US$ 300 to more than US$ 4,000, usually depending on the reputation of the journal and the services offered. Shorter articles such as Case Reports often get a lower rate. Authors should be very careful about apparently cheap quotes because of dubious providers.

Black or *Predatory Open Access* means fraudulent activities aimed at getting the money, in return providing no or minimal service. Scores of mysterious publishing firms have appeared on the market over the last years, often offering extraordinarily fast manuscript review and production. With a few exceptions, many of those are highly questionable to say the least. The notorious

Beall's list is constantly updated and usually reliable.[24, 25] It should be consulted before a manuscript is submitted to a publisher one knows little about. A beautiful example of what can happen in the Open Access world is the report by Bohannon, published in *Science*, who submitted a fake manuscript to no less than 304 journals.[26]

7.5 Glossary

ALPSP	Association of Learned & Professional Society Publishers
APC	Article Processing Charge
ARRIVE	Animal Research: Reporting of In Vivo Experiments
BMJ	British Medical Journal
CMYK	cyan, magenta, yellow, key (black)
CoI	Conflict of Interest
CONSORT	Consolidated Standards of Reporting Trials
COPE	Committee on Publication Ethics
CR	Case Report
CV	Curriculum Vitae
doc, docx	Microsoft Word file
DOI	Digital Object Identifier
DORA	San Francisco Declaration on Research Assessment
EiC	Editor-in-Chief
EMBASE	Excerpta Medica Database
eps	Encapsulated PostScript file
gif	Graphics Interchange Format file

HSS	Humanities and Social Sciences
HTTP	Hypertext Transfer Protocol
IF	Impact Factor (see JIF)
IRB	Institutional Review Board
ISI	Institute for Scientific Information
IU	International Unit
JCR	Journal Citation Reports
JIF	Journal Impact Factor
jpg, jpeg	Joint Photographic Experts Group file
MEDLARS	Medical Literature Analysis and Retrieval System
MEDLINE	Medical Literature Analysis and Retrieval System Online
MeSH	Medical Subject Headings
M&M	Materials and Methods
NAP	National Academies Press (USA)
NC3Rs	National Centre for the Replacement, Refinement & Reduction of Animals in Research (UK)
NCBI	National Center for Biotechnology Information (USA)
NEJM	New England Journal of Medicine
NIH	National Institutes of Health (USA)
NLM	National Library of Medicine (USA)
OA	Open Access
OUP	Oxford University Press
pdf	Portable Document Format file
PLOS	Public Library of Science

PMID	PubMed Identifier
png	Portable Network Graphics file
ppt, pptx	Microsoft Powerpoint file
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
PubMed	Publications in Medicine search engine
PubMedCentral (also: PMC)	PubMed repository
RCT	Randomized Controlled Trial
SAMPL	Statistical Analyses and Methods in the Published Literature
SD	Standard Deviation
SSPS	Statistical Package for the Social Sciences
STM	Science, Technology and Medicine
ThCVS	The Thoracic and Cardiovascular Surgeon
tif, tiff	Tagged Image File Format
URL	Uniform Resource Locator
WAME	World Association of Medical Editors
WoS	Web of Science
xls, xlsx	Microsoft Excel file

8

Final Advice

I sincerely hope that this booklet will help readers write a manuscript on a research topic on which a lot of time has been spent already by doing the study. The advice has therefore been kept short and to the point, and was intended to save time during the writing process. A beginner might also find it helpful to very carefully read a few articles on the research subject which are considered to be the "best," that is, the key references, reflecting what makes them so outstanding.

When planning a study, the accompanying publication(s) should be kept in mind from the outset. It may be definitely worthwhile to write down the Methods section while the study is actually being done, because the content is present and does not have to be reconstructed later in retrospect. In general, the following order of writing the sections is reasonable:

Methods	whilst you are at it
Results	right when you have them
Discussion	debating what to do with these results

Introduction	justifying your research, although the basic concept must have been there at the beginning
Abstract	because only now you know how to condense the content
Title	because now you should know how to sell it.

From the Editor's vantage point, the first question which will probably be raised in the Editorial Office after a paper has been submitted is: "Have the authors asked a question that we want to know the answer to?" Considering the background of the journal, the answer may still be "No" even if everything is fine technically. Reasons for such a rejection are simply that the topic is too specialist for the potential readers, that, conversely, it is not represented by the journal at all, or that the content is deemed to be inconsequential. Sometimes the conclusions are considered to be too well known already. Not all confirmatory studies must be bad, however. Many facts are regarded as common knowledge, but there is pretty little evidence to support them. Additional information may thus be quite welcome.

As long as the design of the study has followed the rules, and the very common mistake of drawing conclusions way beyond the data acquired has been avoided, authors should be on the safe side. The review process may take its time, and it may also need several attempts to find

the right journal. Perseverance is an essential feature in the scientific publication business, which is acceptable if it is supported by quality and honesty. An important message is: Do not be discouraged! In essence, there is simply no substitute for a good idea. If you have one and can furnish proof to support it, it will get published in the end.

Good luck!

9

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