

# Essential Writing, Communication and Narrative Skills for Medical Scientists Before and After the COVID Era

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Springer

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# Preface

*A lecturer should appear easy and collected, undaunted and unconcerned*

*Lecturers which really teach will never be popular; lecturers which are popular will never really teach*

Michael Faraday, “Advice to lecturers” 1848

When the COVID-19 pandemic occurred, all the main communication systems of medical research have undergone an epochal change. Many online journals and magazines have tried to publish inherent works of this specific problem as soon and as fast as possible, soliciting and preferring them to others, thus changing the system of free acceptance of scientific works once. Moreover, the way to communicate these works has no longer occurred through standard scientific congresses but with other systems, websites/streaming and webinars or virtual conferences.

Now there is something systematic missing, which foresees that this may last in the future, in the post COVID-19 era (AC): the communication system of the medical sciences will be different from now on. There will be far fewer classical-style conferences like the ones so popular before COVID-19 outbreak (BC) but there will be more webinars, in streaming and virtual or so-called hybrid conferences. In any case, these should change their format to fit with the new requests and modern advances and attendees’ fears and doubts which will persists for years.

The book idea is based on the legacy left by Michael Faraday, the famous American chemist, who sensed how communicating what happens in science can make the difference between the success and failure of the research itself. In order to maintain the success in medical communication, we should therefore adapt to new styles and be master of the new systems of media communication.

This new book fits well in this period, creating a bridge between those who do research, how it is communicated, what are the “traditional” communication methods and what is all the necessary background to communicate with new tools.

The volume approach is multidisciplinary and written by top experts in the field of communication and education. It will be a useful tool for scientists in this moment of epochal change in medical communication.

It looks that from now on to communicate research, all scientists will “pop op on camera”!

Hope you enjoy and track useful information for organising your research, your papers and your congresses or courses... AC !

Perugia, Italy

Gian Carlo Di Renzo

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# Chapter 1

## The Island of Research (Do Not Block the Path of Enquiry)



Gian Carlo Di Renzo, Valentina Tosto, and Valentina Tsibizova

### 1.1 Introduction

The world of scientific research is articulated and involved many figures, and it is largely influenced by many dynamics.

The original and profound nature of a research should be giving contribution to improve knowledge and even having an impact (hopefully a positive impact) on the human life.

As a researcher (or a scientist, as you want), you are expected to produce and share your research results with others in several forms. Timing and ways of doing research are profoundly changed in the last decades, according to evolving contexts in each field.

In essence, research is performed to enlighten our understanding of a contemporary issue relevant to the needs of society. To accomplish this, a researcher should begin a work for a novel topic based on *curiosity*, *creativity*, *critical thinking*, and *logic*. This leads to the fundamental key elements of the research

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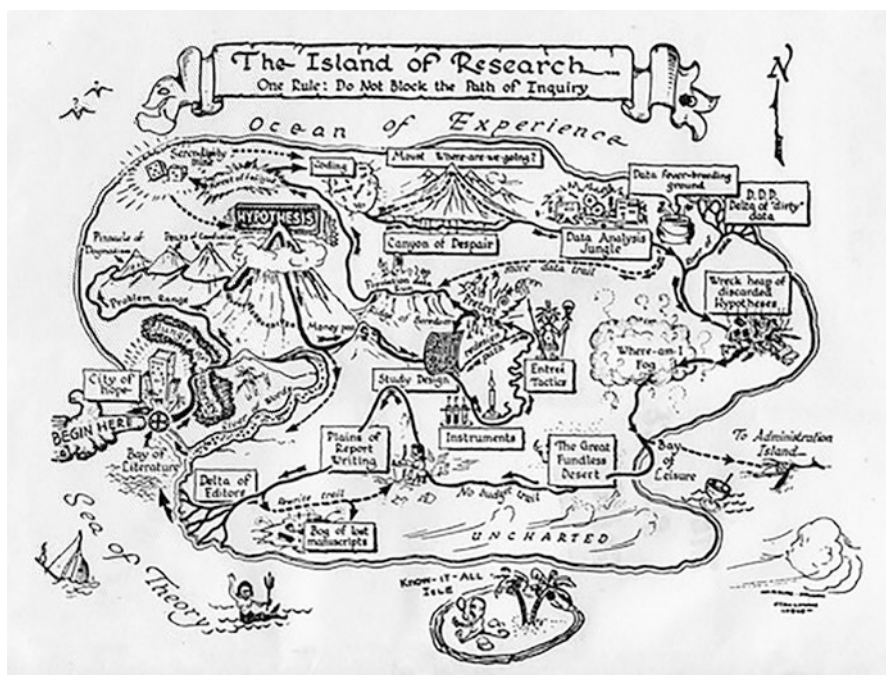
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endeavour: question, objective, hypothesis, experimental tools to test the hypothesis, methodology-design, data analysis, results, and conclusions. When correctly performed, research should produce and spread new knowledge in the scientific community. Important cornerstones of good research are the well-formulated project protocol or proposal that is well executed, analysed, discussed, and concluded [1].

In this essay, I would like to share considerations and opinions about the world of research, how it changed during decades and what are its main keystones, moving by the unique representation of Ernest Harburg in his original poster “The Island of research”, that in the 1960s caught some essential findings on the way of doing research and nowadays is still really actual (Fig. 1.1).

The scientific research stimulates debates, different opinions and sometimes controversies amongst all involved figures. Clinical-scientific purposes are strictly related and dependent on specific interests as described below. Experts tried to educate researchers in the critical steps involved in the development of a scientific idea, its successful execution, and eventual publication. Studies have investigated the impacts of research on society, bringing to bear a fresh approach informed by a more holistic understanding of the research enterprise as a complex, versatile, and dynamic system.



**Fig. 1.1** “The Island of research. One rule: do not block the path of inquiry” by Ernest Harburg, 1966

## 1.2 The Island of Research: A Charming and Adventure Tour

“The Island of research. One rule: do not block the path of inquiry” is a illustration by Ernest Harburg (from the University of Michigan. Box 1.1), prepared with Elaine Stallman and drawn by William Brudon. It was first published in *The American Scientist* 54:470, 1966 and called “Research Map” [2]. Later the illustration was used as a cover in a book, *The Science Game* by Neil Mck Agnew and Sandra W. Pake published in 1978.

The fascinating map has aroused great curiosity amongst researchers for its disarming truthfulness. Is not a charming image?

The complexity underlying the world of research emerges from this image. The reading of the opera may be not immediate: the first impact could result strong, but paying attention and using a critical point of view the observer can start an “original tour” amongst the essential key points of the island of research. There are both references to good and negative aspects that characterized clinical research. Is there a provocative intent or only an “aseptic allegorical” illustration in this image? ... Probably the answer to these questions is to be left in the eyes of the beholder!

A simple transcript of map features in line with the interpretations given during the years is:

**Point of start** (qualities of a good researcher: curiosity, passion, conventional and anti-conventional thinking, logic) → Sea of Theory = Sea of Literature (what we already know) → City of Hope (where ideas are born and the researchers believe in) → Jungle of Authority → Problem Range → Pinnacle of Dogmatism → Peaks of Confusion → HYPOTHESIS → River of Words [→ Money Pass] → Study Design → Instruments → Redesign path → Pretest → Ridge of Boredom → Population data Run → Forrest of Fatigue [→ Never give up, Serendipity mine] → Ocean of Experience [→ Where-are-we-going?] → Canyon of Despair → Data Analysis Jungle [→ too data, technologies and softwares, quality of analysis] → River of Data → also “dirty” data → Wreck heap of discarded Hypotheses [Bay of Leisure → To Administration Island] → The Great Fundless Desert → No budget Trail → Plains of Report Writing [→ Rewrite Trail → Bog of lost manuscripts] → Delta of Editors (many influencing factors) → Bay of Literature (again here ... source of comparison, confirmation or denial, new insights for future) → **ARRIVAL? ...**

... Are we sure that at the end of this adventurous journey there is an arrival? The figure does not show it clearly; it leaves this aspect in suspense, according to the

principle of research and its never-ending history. Each research is a journey that has a goal, but not a definitive arrival!

### Box 1.1 Ernest Harburg's Profile

- Senior Research Scientist, Emeritus, Department of Epidemiology and Department of Psychology, University of Michigan;
- Founding President and Board Member, The Yip Harburg Foundation;
- Member, Glocca Morra Music Publishing LLC.
- College of the City of New York B.S.S. 1951 History.
- University of Wisconsin, Madison M.A. 1956 Cultural Anthropology.
- The University of Michigan, Ann Arbor Ph.D. 1962 Social Psychology.
- Dr. Harburg's research interests and scholarly publications with a host of collaborators have covered a wide range of topics, including interpersonal conflict, urban life and mental health, rheumatoid arthritis, residential mobility, and correlates of smoking.
- He is best known for his long-term programmatic empirical studies of various correlates and determinants of blood pressure – a series of biological variables, racial, ethnic, and heredity variables, work status and satisfaction, age, personality traits, modes of coping, behavioural patterns and for his more recent work on intra-familial transmission of patterns of alcohol usage.

## 1.3 Mapping out the Process for Scientific Research

The practical results do not matter. What counts is the free and disinterested disinterest of the genius of man.

(“The roots of heaven”, Romain Gary, 1956)

## 1.4 Principles of Technical Aspects

Without going in too details, this paragraph describes the technical principles on which clinical research usually moves.

Research is both *theoretical* and *empirical*. It is theoretical because the starting point of scientific research is the conceptualization of a research topic and development of a research question and hypothesis. Research is empirical/practical because all of the planned studies involve a series of rules, observations, measurements, and analyses of data that are all based on proper experimental design [1, 3–10].

Overall, a scientific research development should include several main steps:

- *Define the idea* and the research questions-purposes (the keystone of the entire scientific enterprise. The idea on which a research project is built should be

novel, appropriate to achieve within the existing conditions and useful to the medical community and society at large).

- *Literature review* (“the research in the research”; know the state of knowledges in the area of specific topic of interest; it is the process of examining published sources of information, databases, and search engines).
- *Define design and methodology* of the research, consider available sources to carry on.
- *Data collection* (related with type of research. Several sources and/or modality of collection available now).
- *Statistical analysis* (the process to refer/choose and use sophisticated statistic softwares and other specific networks of data analysis. Modern technologies have greatly improved this research step: large databases available, easier and faster data analysis).
- *Discuss and draw conclusions* (the process of observation and comparison of study results with already known evidence; analyse and discuss why).
- *Communicate the results* (researchers do not only “do” science but also “write” science to share the evidence, to eventually apply useful results in the clinical practice, to give new insights for future perspectives and further researches).

## 1.5 Past and Current Trends: Is There a Shift in the Focus?

Great things are not accomplished by those who yield to trends and fads and popular opinion

(“On the road”, Jack Kerouac, 1957)

Change may be frightening, but it results usually necessary...

Undoubtedly, in the last decades, purposes and interests in scientific research are changed according to the progress of a global system. In the past, the scenario in which scientific research moved was different. Sometimes experts underlined that in the past, the researcher’s enthusiasm for a new idea and hypothesis was dominant and the leading element in a context where often sources were less. On the contrary, nowadays research is often blamed for receiving pressure by industry and policy interests. Moreover, it sometimes moves from ideas and projects that arise from specific purposes, not only clinical but also related with personal objectives (career path), the prestige of a department or a country, the economic-financial interests, losing that sense of original and ancient purity, and that high profile of scientific quality. Debates and controversies regard ethical-unethical behaviours, personal/career purposes, research promotion pathways, industries interests/interferences, level of quality of trials, and control systems. As in any field of life, it is necessary to contextualize and recognize the inevitability of progress and its good and bad consequences. Therefore, there is probably a part of truth in the criticisms and debates, but surely the profound high-quality profiles of researchers and their work still survive.

Undoubtedly, clinical trials have been fundamental for understanding disease pathways and in fostering the development of novel treatments (pharmacological



therapies, devices, and tools) in medicine. One important issue in this field is how they continue to change over time. From the first recorded trial of legumes in biblical times to the first randomized controlled trial of streptomycin in 1946, the history of clinical trial covers a wide variety of challenges: scientific, ethical, and regulatory.

Some developments in the clinical research enterprise arised from since World War II. Moreover, a recent study analysing clinical trials in psychiatry over the past 60 years showed substantial changes in the use of statistical methods in the reporting of abstracts and results, as well as increased use in recent trials of informed consent, washout periods, the intention-to-treat approach, and parametric tests [11]. Many of these changes have been shaped by historical events. Main examples, the development of ethical guidelines, have been marked by three milestones: the Nuremberg Code [12] made voluntary consent mandatory for clinical research; the Declaration of Helsinki [13] codified the ethical principles for human experimental research; and the infamous Tuskegee Syphilis Study [12] led to the Belmont Report, which increased protection for human research subjects and defined informed consent in different research settings. Another important historical event that has shaped clinical research is the issue of adverse effects associated with novel interventions. One of the landmark examples is the use of thalidomide, which resulted in unexpected harm to the foetus. Here, the development of study phases (phases I, II, III, and IV) and additional pre-clinical studies has greatly increased the safety of new drugs and devices.

Regulatory changes have also been important in increasing the safety of clinical trials. A heated debate is currently taking place on the use of placebos and the further development of non-inferiority trials. At the same time, some scientists claim that ethics committees are becoming overly bureaucratic and not fulfilling their mission well [14]. Options for balancing the prevention of unethical behaviour with the promotion of research include decreasing the length of research proposals and informed consent forms and giving different review processes according to the risk of the intervention and the benefits to patients. Clinical trial reporting has also been constantly developing to increase transparency in clinical research. One example is the database registry [clinicaltrials.gov](https://clinicaltrials.gov) [15] which has had a significant impact on clinical research. This is also the case for the Consolidated Standards of Reporting Trials (CONSORT) [16, 17], an important effort to improve transparency in reporting randomized controlled trials so that readers can better understand a study's design, methodology, and the validity of its results.

## 1.6 Some Historical Memories

The charm of history and its enigmatic lesson consist in the fact that, from age to age, nothing changes and yet everything is completely different.

(“Music at night”, Aldous Huxley, 1931)

History is full of anecdotes regarding how the best scientific innovations were born.