Master's thesis

Project Management

2020

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COMMUNICATION CHALLENGES AND OPPORTUNITIES IN GLOBAL CLINICAL TRIALS

– Communicating with the language of science

TURKU AMK
TURKU UNIVERSITY OF APPLIED SCIENCES

MASTER'S THESIS | ABSTRACT

TURKU UNIVERSITY OF APPLIED SCIENCES

Project Management

2020 | 45, 2 pages in appendices

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COMMUNICATION CHALLENGES AND OPPORTUNITIES IN GLOBAL CLINICAL TRIALS

- Communicating with the language of science

The aim of this thesis was to examine what types and ways of communication now and in the future best support global clinical research, and what are the challenges and opportunities in making the conduct of global clinical trials faster, more cost-efficient, and more successful. The thesis was done for Faron Pharmaceuticals Ltd. (Faron), which is a biopharmaceutical clinical research company in Turku, Finland.

The research methods used were thematic analysis by interviewing two project managers in Faron Phase I/II oncology trial called MATINS and document analysis method by reviewing the most current scientific peer-reviewed articles and other literature in the areas of clinical research and communication.

Key findings were that the trainings in communication for all trial team members are necessary to enable fluent information flow before, during and after the trial. Increased use of virtual environments require efficient guidelines for virtual working. It is essential to manage building team trust, which will lead to faster decision-making. Still, online and face-to-face meetings are equally effective and necessary types of communication when performing clinical trials depending on the audience, meeting topics and goals.

The use of new internet-based engagement tools for communication and technologies like artificial intelligence through different platforms speed up the selection of clinical study sites and patient enrolment process as well as finding the ideal dose for drug. A wise way of using social media accelerates the public's awareness of the company and its trials and could also be used for research purposes.

KEYWORDS:

Clinical trial, clinical research, communication, virtual teams, virtual work, virtual meetings, stakeholder, engagement, social media

OPINNÄYTETYÖ (YAMK) | TIIVISTELMÄ

TURUN AMMATTIKORKEAKOULU

Projektijohtaminen

2020 | 45 sivua, 2 liitesivua

Susanne Laakso

VIESTINNÄN HAASTEET JA MAHDOLLISUUDET KANSAINVÄLISISSÄ KLIINISISSÄ LÄÄKETUTKIMUKSISSA

- Viestintää tieteen kielellä

Opinnäytetyön tavoitteena oli tutkia, millaiset viestinnän muodot nykyään ja tulevaisuudessa parhaiten tukevat kansainvälistä kliinistä lääketutkimusta, mitkä ovat haasteet ja mahdollisuudet tutkimusten nopeampaan, kustannustehokkaampaan ja menestyksekkäämpään tekemiseen. Opinnäytetyö tehtiin Faron Pharmaceuticals Oy: lle (Faron), joka on biofarmaseuttinen lääketutkimusyritys Turun kaupungissa, Suomessa.

Tutkimusmenetelminä käytettiin temaattista analyysiä ja dokumenttianalyysiä. Tutkimukseen haastateltiin kahta projektipäällikköä, jotka vastaavat Faronin MATINS-tutkimuksen etenemisestä. Lisäksi tutkimusmateriaali koostui vertaisarvioiduista tieteellisistä artikkeleista ja muusta lääketutkimuksen ja viestinnän alan kirjallisuudesta.

Tutkimuksen tuloksena todettiin, että kaikille lääketutkimuksen toteuttamiseen osallistuville tulisi antaa viestinnän alan koulutusta, joka on edellytys sujuvalle tiedonkululle koko tutkimuksen elinkaaren aikana. Erilaisten virtuaaliympäristöjen lisääntynyt käyttö päivittäisessä työssä on muuttanut tiimityöskentelyn tapoja, mikä edellyttää yhteisten sääntöjen luomista. Yhteiset pelisäännöt virtuaalisessa tiimityöskentelyssä kasvattavat luottamusta tiimin jäsenten keskuudessa, mikä puolestaan johtaa nopeampaan päätöksentekoon. Lääketutkimusalalla verkossa järjestetyt kokoukset ovat yhtä tehokkaita kuin kokoukset, joissa tavataan kasvokkain. Kokoustyypin valinnassa on otettava huomioon, ketkä ovat kokouksen osapuolia, mikä on kokouksen aihe ja tavoitteet. Uusien internet-pohjaisten ohjelmistojen ja teknologioiden käyttöönottaminen nopeuttaa lääketutkimuksen eri vaiheita, kuten tutkimuskeskusten ja optimaalisen lääkeannoksen valintaa sekä potilasrekrytointia. Sosiaalisen median taitava hyödyntäminen kansainvälisissä lääketutkimuksissa voi tuoda yritykselle ja sen tutkimuksille laajaa julkisuutta ja sitä voi myös käyttää tutkimustyökaluna.

ASIASANAT:

Kliininen lääketutkimus, viestintä, virtuaaliset tiimit, virtuaalityö, virtuaalikokoukset, sidosryhmä, sitouttaminen, sosiaalinen media.

CONTENT

APPENDICES

FIGURES

LIST OF ABBREVIATIONS

ACC	American College of Cardiology
AEC	ASEAN Economic Community
ASEAN	Association of Southeast Asian Nations
AI	Artificial Intelligence
AIM	Alternative Investment Market
AVAC	Global Advocacy for HIV Prevention
CRA	Clinical Research Associate
CRO	Contract Research Organization
CSR	Clinical Study Report
CTTI	Clinical Trials Transformation Initiative
DIA	Drug Information Association
e-CRF	Electronic Case Report Form
e-TMF	Electronic Trial Master File
FAQs	Frequently Asked Questions
FDA	Food and Drug Administration
FIH	First-In-Human
GCP	Good Clinical Practice
GPP	Good Participatory Practice
HCP	Healthcare Professionals
HIV	Human Immunodeficiency Virus
ICH	International Conference on Harmonisation of Technical Requirements for Registration of Pharmaceuticals for Human Use
ICT	International Clinical Trials -magazine
IFN	Interferon
IM	Investigator Meeting
IMP	Investigational Medicinal Product
IRT	Interactive Response Technology
IV	Intravenous

JAMA	The Journal of the American Medical Association
KOL	Key Opinion Leader
MERS	Middle East Respiratory Syndrome
MHRA	Medicines and Healthcare Products Regulatory Agency
PI	Principal Investigator
PrEP	Pre-exposure prophylaxis
SARS	Severe Acute Respiratory Syndrome
TA	Thematic Analysis
US	United States
WHO	World Health Organization

1 INTRODUCTION

1.1 Background of the thesis

The thesis was done for Faron Pharmaceuticals Ltd. (Faron), which is a clinical stage biopharmaceutical company focusing on drug development for immuno-oncology, organ traumas and vascular damages. Currently Faron has two major drug research programs called Traumakine (FP-1201-lyo) and Clevegen (FP-1305). MATINS, a Phase I/II first-in-human (FIH) clinical study with Clevegen, is now ongoing in patients with advanced solid tumours and is currently moving rabidly forward. The expectations are very high as the results of Phase I of the study were very positive.

When I started at Faron Pharmaceuticals Ltd. (Faron) in 2017, a Phase III clinical trial called INTEREST was ongoing with Traumakine. The primary objective of the study was to demonstrate the efficacy of FP-1201-lyo in improving the clinical course and outcome based on survival and need for mechanical ventilation in patients with moderate or severe acute respiratory distress syndrome (ARDS). Total 301 patients were enrolled in investigational sites located in Europe.

The statistical results of the INTEREST study in May 2018 unfortunately were not what were expected and the collection of the data from the patients was terminated early. Study Day 90 results showed that the investigational medicinal product (IMP) did not reduce mortality or ventilator free days. This last period of the INTEREST study consisted of many different types of communications. Face-to-face meetings, online meetings, newsletters, press releases and emails going back and forth between all parties involved. A lot of discussions were done on social media in different kinds of groups as well. As Faron was listed on Alternative Investment Market (AIM) this caused also a lot of turbulence in the stock markets and Faron needed to respond fast.

Despite the fact that the INTEREST study results were not what the company expected, Faron continued its research work and started immediately to re-review the biomarker data to find out the root cause of the unexpected results and what

had gone wrong. Due to this efficient action-taking, it was later indicated, that Interferon beta-1a affected on death and days free from mechanical ventilation and the use of corticosteroids had a big impact on the data (Ranieri 2020). This was an important finding as the world was going to face its worst pneumonia virus outbreak for a long time.

Today, the whole world is witnessing an unpredictable pandemia, COVID-19. It is an infectious disease, caused by a new, unknown virus. This virus can cause illness in both animals and humans. The symptomps range from the common cold to serious respiratory infection diseases like middle east respiratory syndrome (MERS) and severe acute respiratory syndrome (SARS). (WHO 2020.) By April 2020 over 100.000 people had died of COVID-19 (Worldometer 2020). Scientists and researchers are desperately trying to examine and find a drug or a vaccine to prevent more people from getting infected. Faron also saw the opportunity of the investigational medicinal drug Traumakine, which was developed especially for acute respiratory distress syndrome, the syndrome which also many COVID-19 patients suffers. So, two years after the early termination of the INTEREST trial, Traumakine gets another chance. Today Faron has joined a new trial conducted by REMAP-CAP, which is a global network of leading experts, institutions and research networks. This new study compares directly the treatment effect of Faron's investigational intravenous (IV) interferon (IFN) beta-1a, hydrocortisone treatments and other study treatment options for COVID-19 patients and patients requiring intensive care due to other causes of pneumonia.

Performing a successful global clinical trial is always a challenge and a strong joint effort of many functions are needed: sponsor, who has the study design and drug, contract research organization (CRO) and other vendors to support and provide their expertise, committed study sites and many, many more. In order for the study to proceed smoothly and on schedule, communication between all these parties must be well planned, on time and controlled from the beginning, during and after the study. All study team members must be trained on and prepared for how to respond when something unexpected happens. All possible

scenarios must be taken into account. In 2020 Faron listed on Nasdaq First North Growth Market which also sets the requirements for accurate and fluent information flow. All Faron's concluded, ongoing and future trials have one thing in common. They have and will produce ground-breaking scientific results, which need to be shared worldwide to different audiences. This requires a well-planned communication strategy.

1.2 Goals and research problem of the thesis

The purpose of this thesis was to examine different communicational challenges and opportunities when conducting global clinical trials. The area of clinical research is an expensive business, highly regulated and controlled by different authorities, who set challenging rules and timelines to the sponsors. This means that all parties of the clinical trial must communicate seamlessly with each other. Faron, as a study sponsor, is moving step-by-step to more global operations, where project teams are decentralized and effective communication will be more and more vital for conducting clinical trials. The future offers many new tools for communication, which can make conducting clinical trials more efficient.

The research problem was approached by exploring scientific articles and other literature regarding global communications and by interviewing two people involved in Farons latest ongoing clinical trial MATINS. This thesis sets the following questions:

1. What kind of communicational challenges there are in conducting global clinical trials?

2. What are future communication tools and opportunities to make conducting global clinical trials faster, more cost-efficient, and more succesful?

Findings of this thesis provide Faron the best choices of communication to manage global clinical trials more succesfully in future.

1.3 The research methods used in the thesis

Global clinical research business and medical science move fast ahead. Doing one single clinical trial can take several years. New studies are registered and new results published almost daily. For this reason this thesis uses as up to date references as possible. The methods of this thesis are the thematic analysis of the two interviews and the document analysis of several articles and other documentation from the clinical research area.

Two interviews were conducted on the 8th and the 15th of April 2020 and recorded by using Microsoft Teams. The interviewees were carefully selected from similar positions in the MATINS study but one representing the sponsor Faron, and the other the CRO Simbec-Orion. The first interviewee was Clinical Research Manager Maria Jokinen from Faron, who is the Project Manager in the MATINS study. The second interviewee was Senior Project Manager Laura Gardner, who also acts as the Project Manager in the MATINS study and represents the CRO Simbec-Orion. The structure of these interviews was built to emphasize the importance of firsthand knowledge and experience in communications when conducting clinical trials. Both interviews were done by using the basic techniques of interviewing. The consents (appendixes 1 and 2) from the interviewees and the topics from the interviewer were given in advance by email.

The thematic analysis (TA) is one of the methods of qualitative research. TA is a flexible method and gives the interviewer the possibility to create new questions during the interview. It also helps identifying and interpreting patterns in the given topics of the interview. (Braun 2014, 1-4.) Document analysis includes both printed and electronic material, which are systematically reviewed and evaluated by the researcher. Documentation can consist of different kind of materials like for example advertisements, books and brochures, diaries and journals, maps and charts, newspapers and press releases and are usually reviewed as part of the study. Researchers often use peer-reviewed articles as a source of evidence to support and rationalize the chosen topics of the study. (Bowen 2009, 27-28.)

To find the answers to the research problem and the questions this thesis examines the most current medical articles and studies written by professionals in the field of clinical trials were reviewed. The referred peer-reviewed articles were published between years 2018 - 2020 in the International Clinical Trials - magazine (ICT) and in other similar scientific journals. All articles were written by specialists in different areas such as study conducting, study supplies and vendor management, risk and data management and communications of global clinical research.

1.4 Structure of the thesis

The introductory chapter is followed by Chapter 2 which represents the overview of global clinical trials and the current situation of the research market. Influences of the cultural diversities create big challenges in the pharmaceutical field. These are explored with statistics and articles, which represents the idea of a new study area like ASEAN. Chapter 2 also examines more deeply the communicational steps before, during and after the global clinical trial. The use of virtual environment has increased enormously and this sets new challenges to team communication. The material from Maria Jokinen's and Laura Gardner's interviews was used as reference throughout Chapters 2 and 3.

An important literature reference was the Communications Handbook for Clinical Trials. It was written in 2011 in collaboration between several individuals, experts, organisations and communities. The idea for the handbook started already in 2004, when a clinical trial was planned to test oral tenofovir in Cambodia to prevent human immunodeficiency virus (HIV). The international attention was explosive and the media started to challenge the sponsor of the clinical trial daily. Communicational skills were set to their limits. Internet filled up with comments and new discussion forums. In 2011, when this book was published, the world had changed a lot. The expansion of social media and digitalization has affected also the pharmaceutical business in many ways by giving new opportunities and also big challenges.

Stakeholder engagement role is significant when planning the trial and communications. Chapter 2 focuses on different audiences in clinical trials. The importance of the stakeholder engagement is presented with the results of the tracer study made in US by The Fred Hutchinson Cancer Research Center.

New communication technologies have been developed all the time to make conducting of global clinical trials more efficient. Chapter 2 presents engagement platforms, which can support and help the sponsor to move faster from one step to another. The last topic in Chapter 2 examines the use of social media in global clinical trials. This is observed by viewing the statistics published by CREATION Pinpoint websites in UK. The influence of healthcare professionals (HCPs) on communication is studied by their activity on Twitter. This chapter also displays the biggest challenges on how to maintain ideal communications while managing global clinial trials. The last Chapter 4 gathers the conclusions of this thesis.

2 GLOBAL CLINICAL TRIALS AND COMMUNICATIONS

2.1 Overview of global clinical trials

As of February 12th 2020 total 330.113 clinical trials were listed globally in 209 countries. The number has risen year by year. The biggest research market regions are United States (US) and Europe. (Clinicaltrials.gov. 2020; figures 1. and 2.)

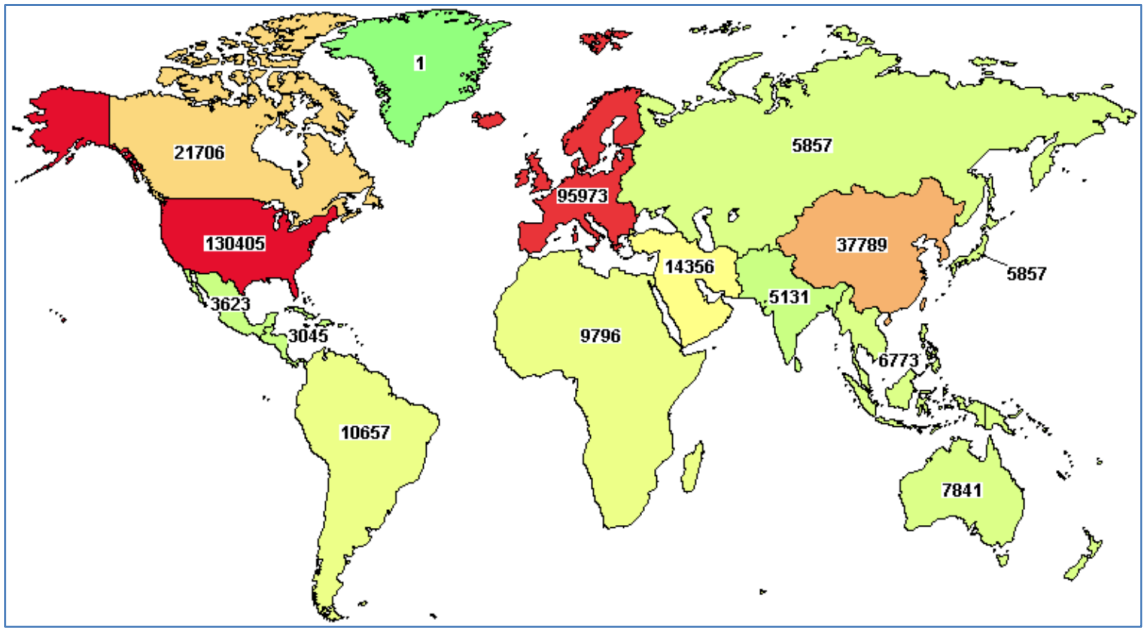


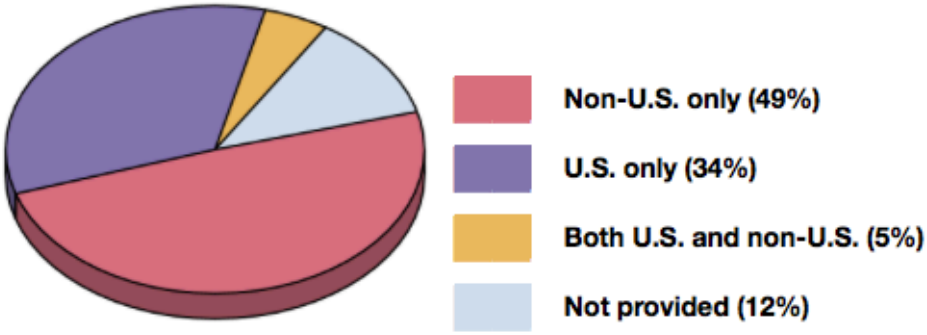
Figure 4. Map of all studies registered on ClinicalTrials.gov database (Clinicaltrials.gov 2020).

There are several reasons how the sponsor chooses the area of its clinical trial. In Europe, the overall costs of the trial are lower than in the US. However, Southeast Asia is rapidly gaining interest from international pharma organizations and biotechnology companies. Low operational costs and a large population with a big pool of treatment naïve patients are very tempting points compared to western markets. (Seo et al. 2019, 8-9.) Trial costs in Asia are very attractive to the researchers, as compared to US those are relatively 30-40 % lower (Ali et al. 2018, 194-199). US and Europe also have big enrolment challenges as racial and ethnic minorities, women, and the elderly are often under-represented. Elderly

people account for 63 % of new cancer cases every year but only 25 % of them are enrolled in trials. (Goeken 2019, 58.)

Percentage of Registered Studies by Location (as of February 12, 2020)

Total of 330,113 studies



Location	Number of Registered Studies and Percentage of Total (as of February 12, 2020)
Non-U.S. only	162,254 (49%)
U.S. only	111,640 (34%)
Both U.S. and non-U.S.	17,173 (5%)
Not provided	39,046 (12%)
Total	330,113 (100%)

Figure 5. Percentage of registered clinical studies by location as of February 12, 2020 (Clinicaltrials.gov 2020).

In 2015 the ASEAN Economic Community (AEC) was created to facilitate clinical trials in Southest Asia. This gave rights for free flow of skilled labour, investment capital, goods and services for over 600 million people. This also affected the regulatory and administrative procedures of clinical trials. Even though the regulatory environment has improved since and become more transparent, there still are many challenges and obstacles for researchers, regulatory agencies and sponsors to overcome. Cultural, ethical, operational, political, regulatory and infrastructural factors are very different from other market regions. Health care

settings are not ideal, skillful researchers hard to find and no high quality equipment available, which affects the quality of study data. (Seo et al. 2019, 8-9.)

Due to the high prices of services in the pharmaceutical business in general, limited resources and tight timelines, small sponsors must be very cost-effective in conducting their trial and performing their vendor oversight and management. External funding might still be needed through large pharmaceutical companies. To allure new investors positive press releases, like approval of the clinical trial submission or informing timely enrollment of the first subject in the study, are needed. For small sponsors the one single trial can be a huge make or break. All depends on the outcome of the trial, which can decide the future of the company and indicate the success of the next financial investment round. (Shön et al. 2019, 30-32.)

Big communicational, language and cultural differences force sponsors to find easier, faster and more cost effective ways to conduct global clinical trials. Countries have different requirements for regulatory activities, import or export licensing of investigational drugs and related supplies, collecting data from the local patients and translating trial documentation to the local language. For example in Asia the family emphasis is very strong and all details of the patient's journey are discussed with all family members before providing the consent for participation. Cultural differences are also seen in the practice of medicine. There are many alternative therapies used, which may affect study excursion and results. To ensure good fluent study continuation and communication among the stakeholders, the smaller sponsors need to find a CRO, whose teams are well-trained, experienced in the chosen trial region and know how to work with multilingual teams. (Seesurn 2019, 10-13.)

The ICH E6 R2 Guideline for Good Clinical Practise (GCP) is an international ethical and scientific quality standard for designing, conducting, recording and reporting trials that involve the participation of human subjects. The sponsor is always responsible for the quality and integrity of the study and also for its vendors subcontractors and third parties. Therefore the appropriate vendor and

oversight management are vital. To ensure patient safety, data integrity and generating outcomes all stakeholders need to be kept satisfied. The sponsor must remember also to observe the evidence closely for postmarketing positioning and reimbursement strategies. It is also the sponsor's responsibility to continuously implement and adapt its processes according to any new regulations and guidelines. (Schön et al. 2019, 30-32.)

GCP values companys resources very high when talking about keeping the given timelines of the trials. Planning of the trial should be built so, that it is realistically possible to close the trial within the agreed timeline. Also it is the sponsor's responsibility to maintain the retrospective data available to be able to recruit suitable subjects within the agreed timelines. The trial facilities should be adequate and the study teams qualified to perform the trial properly and safely. Also the assisting staff need to have proper knowledge of the IMP, protocol and other study specific information. (EMA 1995, 20-21.)

Another global guideline, the Good Participatory Practice (GPP) was originally created because of the learnings from the pre-exposure prophylaxis (PrEP) trials in 2014 and 2015 made in Cambodia and Cameroon. There was a lot of poor communication and misunderstandings among the stakeholders, which led to the creation of the GPP as it appeared that there was no communication guidelines available for conducting a clinical trial. As a result, GPP includes more detailed guidance for research stakeholders engagement and communications than GCP. (AVAC 2011.) GCP guidelines are used widely and valid GCP-certificates are required from all trial team members. However, there are no requirements for any communication training for the trial staff (Robinson et al. 2011, 1.)

The drug development industry is document-intensive and most of the trial material is classified as confidential information. Separate data transfer platfoms are used for data sharing. The purpose of these is to create workspaces for external stakeholders that can be safely used for document transmission and processing. In clinical trials almost all communication after and during the trial is documented. The trial master file (TMF) is a diary of the trial and how it was conducted and managed. It communicates to the auditor the whole lifecycle of

the trial. (DIA 2018.) Email correspondence is very commonly used as a key method of communication in clinical trials. This correspondence includes many decisions and other important information of the trial. Relevant correspondence area in the TMF is considered as the essential documentation which covers nearly all communication between all parties of the trial. At the end of the trial, TMF proves the integrity of the data and verifies compliance with GCP. (Francis 2015.)

2.2 Planning for communication

The basic and important function of planning and scheduling any kind of project is coordination and integration of all the efforts from the beginning and until the end of the project. Planning is about gathering and organizing our thoughts. It is about making decisions about the timelines, resources and costs. Planning and scheduling is about analysing the feasible scenarios using the available data, assumptions and constraints and developing a baseline for the execution of the project. (Turner 2014, 235.)

Managing projects within time, cost and performance is easier said than done because project management environment is often turbulent, and it consists of many different pieces and things can change fast. To succeed in that kind of working environment, a project manager needs to have quite disciplined time management skills, because time management is one of the keys to being effective. Sometimes external reasons can cause delays in schedule, but one important internal factor is also the project manager, and it is often said that if the project manager cannot control his/hers own time, then he/she will control nothing else on the project. (Kerzner 2003, 273.) Experience in managing virtual global teams and leading such groups to successful project completion is important. Equally valuable skills are training in delegation, goal setting, role clarification, conflict resolution, and self-management. By selecting these proven winners, the organization tells how much it recognizes the work they are doing – hiring the best managers available. (Ford et al. 2017, 25-34.)

In clinical trials, the project manager often carries out responsibilities from many areas of the trial. In addition to the traditional skills of project management, project leaders need to have substantial experience in the area of clinical research but also they need to observe the working environment and see that it is ideal for their team to achieve full potential and overcome project challenges. (McGrath et al. 2020, 9.) Sponsors are expecting good manners and successful project outcomes, which are achieved by underlying principles of openness and transparency (Shön et al. 2019, 32).

Announcing the start of the trial depends on various things. Study setting, timing, global and local context, budget and the overall goals will determine the approach. Press releases to international media and articles in an organizational newsletter are usually considered when talking about a global clinical trial. (Robinson et al. 2011, 45.)

Ways of communication differs depending on the size of the sponsor. Unconventional decision-making processes are not a surprise when talking about smaller sponsor companies. Flat hierarchies and innovative thinking are also recognized more clearly. These factors need to be considered between the sponsor and the chosen CRO in the very beginning of the cooperation. Better yet, even already in the bid defence meetings so the organizational structure could be seen as transparent as possible. This can be done with clearly defining roles and responsibilities. All limitations and dissimilar approaches should be acknowledged to create successful and transparent working environment. (Shön et al. 2019, 30-32.)

When selecting the CRO to the study, many functions can be outsourced. To do this successfully, sponsors need to reflect their choises and decisions in relation to their company's business objectives. Quality, costs and time optimization need to be in place, and also at the start of the outsourcing activities, the vendor management plan and an effective risk mitigation strategy that fits the sponsor's organization.

The relationship between the sponsor and the vendor must be based on trust and good communication throughout the contract lifetime. Building such a relationship can take a long time, but on the other hand, it can be destroyed within a short time. Mutual understanding about the goals, expectations, decision-making, processes, values and philosophies are essential. (Schön et al. 2019, 30-32.) Between the sponsor and the CRO, Gardner (Interview 2020, appendix 2) sees a challenge in understanding the different kind of internal pressure there are on each side. There are also many internal tasks related to the study, which are not visible for all. When the sponsor quickly needs for example lab data to be collected from the study sites, the purpose of the request could also be explained to have a faster response from the site investigators. This way they can be motivated and prioritize their tasks more easily.

The most important tool for successful communication in the clinical trial planning is to create a good strategic communication plan. The plan should include strategies for both internal and external stakeholder communication as well as a separate plan with different scenarios in case of crises. (Robinson et al. 2011, 44.)

Before the plan is written, the communications team should be identified and their roles listed. It is also good to include the communication skills and experience of the team members in the plan. It would be valuable information to know if one team member has received media training recently or if for example the principal investigator (PI) has served as a spokesperson for another trial. The plan should also list everyone, and preferably not just by group but by naming the person, representing the group. As many other trial plans, the communication plan needs to be updated as the study moves forward. Groups and individuals mentioned in it might change many times during the trial. (Robinson et al. 2011, 27-34.)

The strategic communications plan should also deal with unexpected events and identify risks. To be able to prevent potential crises, the researcher must anticipate which issues are likely to happen. When controversy is acknowledged and therefore expected, it is easier to develop a more detailed crisis communication plan. (Robinson et al. 2011, 38.)

The dissemination of the trial results to different audiences by using different channels, timelines and materials in the end of the trial should also be planned in the very beginning of the trial or rather before. This could be integrated into the strategic communication plan, so it is easier to include to the total budget and also because as the trial progresses, the plan for dissiminating the results evolves. (Robinson et al. 2011, 39.)

2.3 Stakeholder engagement and communication

Effective projects are based on effective stakeholder communication (PMI 2013, 7). Stakeholder engagement plays a big role when planning the trial and communications. Communication with the trial participants, the patients and their families during the study is important. Newsletters and brochures written in their own language can make a strong impact and lead to positive feedback sharing with other people. (Najjar 2019, 26.)

Clinical trial stakeholders (Figure 3.), internal and external, include individuals whose time and effort are needed to perform the trial and also the potential participants. The influence of people in each stakeholder group must not be ignored. There might be personalities, leaders, whose opinions are higly acknowledged by others. Therefore by understanding this, the reseacher can expand the impact of their communications. (Robinson et al. 2011, 28.)

Study site teams are one of the most important stakeholders in clinical trials. They are the ones that meet the patients, collect and insert the data to the electronic case report forms (e-CRF). At the same time they are working with “your” study data, they might have a dozen other study data to insert too. In this kind of competitive position the sponsor needs to think about what are the best tools for engaging the study sites’ staff. Specific and relevant communication is the key. To make sure there will be no protocol deviations, unclean data or costly delays, the sponsor needs to provide enough information to keep sites on track with activation, study tasks, and data query resolutions. (Darasz et al. 2018, 32.)

The Clinical Trials Transformation Initiative (CTTI) is an organization with over 80 members including FDA, Centers for Medicare and Medicaid Services, Office of Human Research Protections, National Institutes of Health and other organizations. CTTI is aiming to develop and drive adoption of practices, that will increase the quality and efficiency of clinical trials. (CTTI 2020.) CTTI has pointed out the three most important areas essential to strategic recruitment planning in clinical trials. First is the trial design and protocol, the second is the trial feasibility and site selection, and the third is communication. (Huang et al. 2018.) In the study about clinical trials recruitment planning Huang et al. (2018) presented as an actionable recommendation that the study teams need to be aware of the stakeholders' needs in order to maximaze their engagement and support. This is obtained by developing more engagening messages through the right channels.

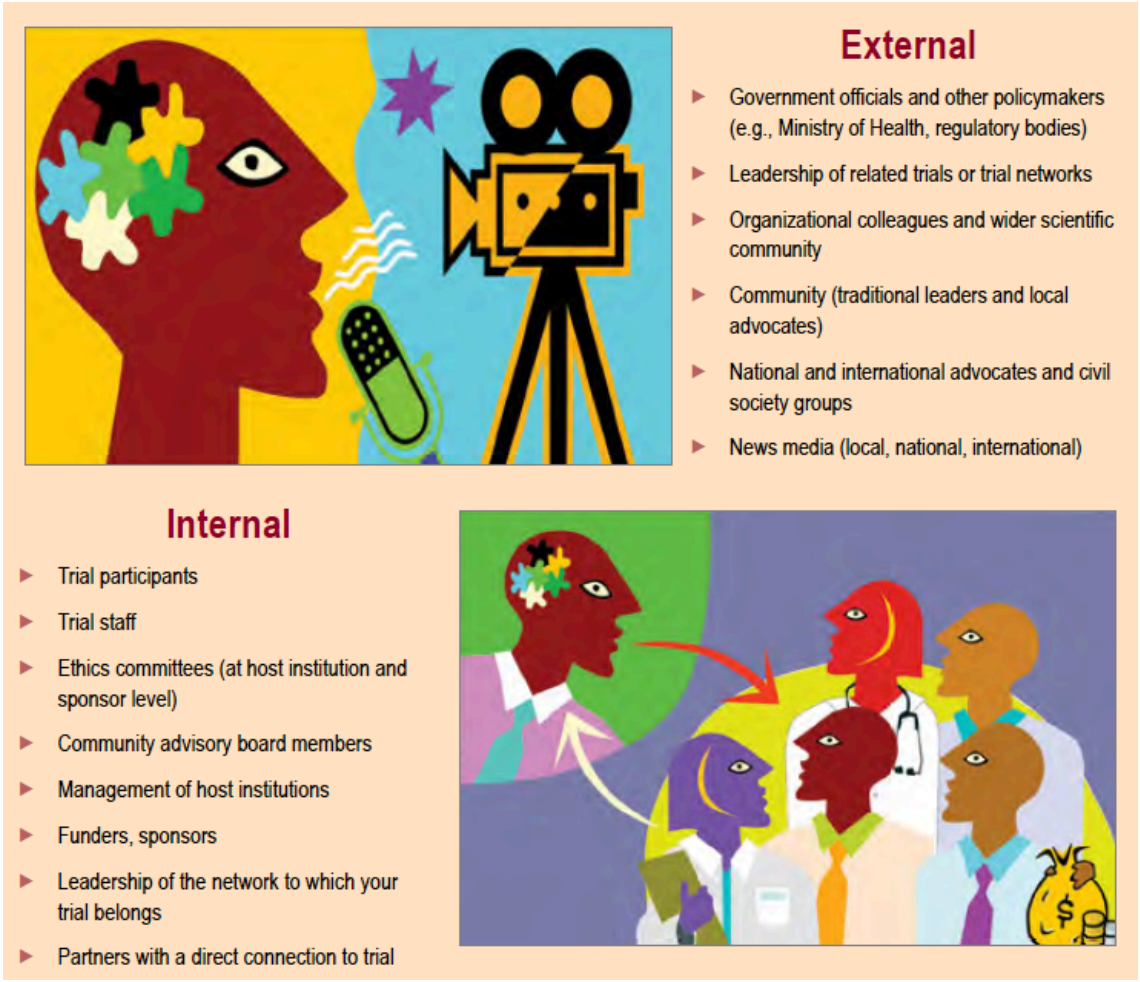


Figure 6. Clinical trial stakeholders. (Robinson et al. 2011, 50.)

The Fred Hutchinson Cancer Research Center in US made a tracer study about effective stakeholder engagement. The study focused on early trial development. The results showed how essential the diverse stakeholder engagement is in optimizing the design, implementation and planned dissemination. The effective engagement was achieved by performing regular communication about the trial progress, open discussion and collaborative problem solving. (Barger et al. 2019, 1-2.) The Figure 4. below lists the best practices of the tracer study.

Figure 7. Best practices of stakeholder engagement (Barger et al. 2019, 6).

Open and honest communication was the key to mutual trust and respect between all parties. A very important point was to acknowledge the fact that not all stakeholders have a scientific backround, so using understandable terms when explaining the study concepts and challenges, made it easier to all stakeholders to fully participate in discussions. (Barger et al. 2019, 6.)

2.4 Communication during and after the trial

Continuing communication and proactivity towards any issues, will increase the spirit of team effort in all stakeholders. Observations from the related studies should be made on ongoing basis and information should be shared with all your stakeholders. This will be useful in the future when the other company releases their study results. This way it can be ensured, that your trial management is prepared to provide consistent and accurate information when the results are made public. (Robinson et al, 2011, 64.)

In addition to daily, weekly and monthly ongoing meetings there are many other type of meetings organized during the trial. One important meeting is the investigator meeting (IM). It is usually the first face-to-face meeting in the study, where sponsor's team, CRO's team and all study sites' staff have a chance to get to know each other. The sites will experience the sense of pride, community and pending accomplishment. They will learn the study specific practises, the study design and protocol and the technology used to enter data. But more importantly, they can share their expertise and learnings with each other. (Darasz et al. 2018, 32-34.) In this sense face-to-face meetings should not be underestimated compared to online meetings. They do increase the study budget (especially travel costs), but the positive effect on teams can lead to more successful collaboration and this might pay off in the end. Face-to-face meetings connect the people involved on a personal level. Once you understand someone's values, corporate culture and beliefs, it is easier to discuss any challenges later over the phone or seek advise by email. (Shön et al. 2019, 30-32.) Jokinen (Interview 2020, appendix 1.) also highligts the importance of meeting someone in person rather than only online. She has experienced this with one study nurse as not getting anwers from her by email, until after meeting her face-to-face. MATINS IM was held in Helsinki in mid March 2020 and it was done online by using streaming technology. The study site members who were not able to participate the meeting on the spot had a possibility to attend online. Jokinen (Interview 2020, appendix 1.) sees this as a special case because of the coronavirus

outbreak and doesn't think this would work with the sites in the near future as a primary type of meeting.

For internal communication face-to-face meetings are held on a daily basis at Faron. However, for example quite many of the MATINS study meetings are done virtually. The study CRO and most of the vendors are located abroad. According to Jokinen (Interview 2020, appendix 1.) one challenge is multitasking during the meeting, which can lead to situations, where later people are not aware of things because they didn't pay attention in the meetings.

The most used type of communication in clinical trial management is email. As project managers of the study Jokinen and Gardner receive several emails per day. Jokinen (Interview 2020, appendix 1.) views that there are so many emails that sometimes the important issues are buried under. As the communication plan has not been finalized yet, the roles and responsibilities are not so clear. Gardner (Interview 2020, appendix 2.) says this is sometimes challenging, and a reason why most emails are going through the project managers. In clinical trials many decisions are noted in the email correspondence, so to avoid unnecessary emailing, the key is to make each email relevant for the person receiving it. To have a quick response, only deliver the information (and only information) the receiver needs. (Darasz et al. 2018, 32-34.) Gardner (Interview 2020, appendix 2.) recognizes the situation, when sometimes you need to copy in many persons as you are not sure, who can provide the information needed. But after the right person replies, you can drop others from the conversation chain. According to Gardner (Interview 2020, appendix 2.) cultural differences are important to consider in email conversations. In some cultures for example the use of smilies can be very useful but when used too much they lose their meening.

Virtual working has grown as organizations have obtained new technologies to solve key problems. Adapting human resources to this new way of working and providing the right tools to meet the location specific needs are a challenge to many organizations. To make virtual working effective, the organizations need to consider many dimensions that make communications and teamwork more

difficult. Different time zones, nationalities and cultures, working styles, and languages need to be concidered in virtual working. (Ford et al. 2017, 25-34.)

Virtual environments make it difficult to team members to observe directly what others are doing as day-to-day informal interactions and nonverbal communications are lost. The old saying goes that you only get one chance to make a first impression. Different personalities act differently. Some make quick judgements when others are willing to give a second chance. (Ford et al. 2017, 25-34.)

There are many ways to make global virtual team meetings more effective. To show the commitment to the team support, the presenter could send team members simple reminders before the meeting to avoid communication pitfalls. Gardner (Interview 2020, appendix 2.) told about the online CRA meeting where all participants came from different countries and so the pronounciation of English was sometimes hard to understand. Courtesy and respecting other team members' time gives the feeling of a caring team lead and organization. Therefore, adjusting meeting times or deadlines to accommodate working hours of the team members across the globe or awareness of their national celebrations or holidays show that each team member is equally important regardless of where they live. Jokinen (Interview 2020, appendix 1.) pointed out that flexibility between study teams is very important as the teams in the MATINS study are quite small.

By selecting a manager who has experience in managing virtual teams can lead the teams into a successful project completion. Like managers, also other the team members need to be trained to understand each other's specific demands in the project. The organization can reinforce the mutual trust with virtual teams by providing the appropriate communication technology. There are many communication tools available for online meetings such as Zoom, Webex, Teams and LoopUp for teams to connect virtually. (Ford et al. 2017, 25-34.)

According to Norhayati et al. (2020) study about cultural boundaries, the emergence of millennials has created a generational culture, that emphasizes on work-life balance, flexibility, and mobility. Team building processes are made of

culture, technology, and people. In a global clinical trial the study sites are located all over the world. Therefore the sponsor might consider forming localized project groups, which would take care of the routine tasks, local customs and other practicalities on the site. For the sponsor the benefits are clear as this would minimize home country employee travel costs and communication efforts worldwide. (Ford, R. 2017.) This would be a great asset for the sponsor as monitoring media, community voices and stakeholder views needs to be done throughout the study. It helps the sponsor react faster to any situation or issue which needs instant attention, for example unexpected trial closures, or negative or sensational media coverage of the trial. (Robinson et al. 2011, 62.)

The sponsors obligations for communication continue after the clinical study report (CSR) has been finalized. The results need to be submitted to variety of audiences through appropriate channels. The scale of dissiminating the results is determined by many factors like funding, timing and human resources. It is recommended that the dissemination of the results process has already been integrated to the strategic communication plan in the trial planning stage so this leaves time for other important actions. Providing key messages keeps the speaking with the media, public and the stakeholders organized and consistent. The key messages also need to correspond to the right audience. The language of science includes a lot of words which have a different meaning in a scientific context than in everyday usage. For example word “systemic toxity” would be easier some to understand as meaning “side effects”. Every researcher knows that the study has no quarantees, so it is very important not to promise more than you can deliver. This is something to keep in mind in every step along the way. (Robinson et al. 2011, 89, 94, 116, 147.)

2.5 Information and communication technologies

Performing global clinical trials demands a huge investment and significant amount of time from the sponsors to complete the trial and produce a marketable drug. However, there are different kinds of communication technology for every area of the trial, which can support and help the sponsor to move faster from one

step to another. The new digital technology is transforming the drug development process. With wearable, mobile and cloud technologies a large amounts of data can be collected. (Darasz et al. 2018, 32-34.)

Managing international supply chains to provide study drug to the site in time, in right amounts and with proper quality taking into account local and regional aspects is not always easy. New technologies like the interactive response technology (IRT) is an excellent help for these purposes as it is designed to manage subject transactions, drug dispensation and inventory supply. (Lefew et al. 2020.) The sponsor has to ensure that IMP reaches the site in good condition and the samples are delivered on time. Long distances and delivery times are a challenge in logistics processes. Continuous monitoring is usually done with the loggers, which travel along with the monitored goods and measure the values in its memory. To move the data from the logger to the computer needs to be made manually at the site. This process leaves too many things at risk. The real-time data collection system could be invested on a highly temperature-stable drug deliveries. This would save costs, improve safety and prevent any excursions from happening. Risks that are usually found in logistics handover situations, could be found by using the real-time technologies, which have a capability of creating an unbroken record of electronic data and sharing this among multiple users. (Asikainen J. 2019, 53-56.)

Study site staff training is mostly done at the IM and at the same time it is people's first chance to understand the trial, the protocol and learn how to use all systems. Unfortunaly, after few days of intensive training people often are overwhelmed with information, so taking all those learnings into practice needs a lot of engagement to the study. Many site team members might participate in the study only after the IM has been held. To help ensure the sites remain engaged throughout the trial, the sponsor and CRO need to approach training as their first opportunity to improve sites quality of life and reduce protocol deviations. To improve the quality of sites lives, the site engagement technology has proved to be an effective mitigation tool, which reduces the likelihood of an error. A good site engagement tool provides actionable information, which will keep sites on

track with all tasks, and data query resolutions and is managed by sites with only few clicks at the most. The information is well-targeted and therefore creates trust and appreciation towards the system. (Darasz et al. 2018, 32-34.) The site engagement platforms are mostly used for communication purposes and need to include certain qualities and functions to be successful. Easy access and intuitive to use with a Google-like search cababilities throughout the portal are essential. The environment of the portal should provide usable, personalized data relevant to each site recipient, be updated frequently, and create a sense of community. Other valuable solutions should also be included, such as training modules, contact information and other documents. (Sarajian 2017).

One effective way of engagement is to show sites how they are doing compared to their peers and encouraging friendly competition. Engagement platforms give the chance to use leader boards, where the sponsor can award achievements by giving badges or sites can share their best practices. There are also other important functions, Frequently Asked Questions (FAQs) and Search. The sponsor can also thank the site withing the platform and this way tell them their work is very much appreciated. Leader boards have proven to be very effective and the PI's usually want their site to be at the top. These boards can be created for example to reward good randomization frequency, on time data uploads or having the least deviations. This kind of engagement technology is a good tool to remind sites that they are all connected and working towards a common goal. (Darasz et al. 2018, 32-34.)

Operational excellence is one of the study sites' most needed assets. Before the sponsor uses an enormous amount of money, time and resources to open a study site, the sponsor should first analyze site performance data. The trial is more likely to be a success, when the sponsor payes more attention to the site selection and activation instead of making a flawless design. To keep data on target an artificial intelligence (AI) -based approach can be used. A 20-40 % improvement can be expected in enrolment performance through the use of a highly effective site selection platform. (Li et al. 2019, 17-21.)

AI provides predictive analytics, clinical trial design, planning, and execution to help sponsors and CRO's to manage trial challenges proactively. AI platforms are able to analyse the impact of minor changes to the study design (eg. Inclusion/exclusion criteria). (Zupancic 2019.) Big pharma companies such as AbbVie and Norvartis have introduced the design and tracked the progress of individual studies by using AI in relation to the digital dashboards (Hole 2018).

2.6 The use of social media in global clinical trials

The internet has enabled worldwide communication and all kind of information is now available within the seconds. Faron is currently using company website, Intra, Faronial (working platform) and social media platforms like LinkedIn and Youtube for online communications. These channels have been very carefully selected to serve the company's purposes. Today, social media is used by over 2,9 billion individuals regularly, and for example currently people are searching for information about COVID-19. Data collected from different social media platforms gives valuable information also for the researcher. People share their symptoms, interactions, photos and travel roots. For example Facebook is working together with the researches by providing them aggregated and anonymized data. Population density maps and movements from location to another indicate how the virus is spreading. When merging the data obtained from social media to the data from consenting patients, the researchers get the insights about individual-level risk. One example is also how many researchers are trying to sequence the genome of COVID-19. With the research tool used through the social media channels, the results can be futher analysed to study how COVID-19 affects different organ functions. (Merchant et al. 2020.)

Data and results from the clinical trials are shared and reshared by Healthcare professionals (HCP) around the world. For them, the use of social media is a primary way to interact with clinical trials through the dissemination of results covering all health therapy areas. Many doctors use different channels of social media to communicate with their peers globally and locally. For those who are not so active in reading journals can this way keep in track with the newest

innovations in health. Using different connection possibilities the internet provides is saving time and money. HCPs don't always have to be present at trainings, meetings, congresses or other professional gatherings anymore. These can be done as e-trainings or using online streaming possibilities. As study results are shared on social media, it doesn't take a long time as those are reshared and at no cost. (Dogget 2019.)

Despite of the benefits social media serves, there are many hidden pitfalls. The pharmaceutical industry is more cautious than most others. Pharmaceutical marketers prefer to lock down all their social media engagement than face the risks by engaging customers via social media. For example direct-to-consumer marketing of prescription-only medicines is illegal outside of the United States or New Zealand, so how can the marketer be sure, these medicines are not sold on to the other countries as well? Still times are changing and major pharmaceutical companies have gone along with social media in some ways. (Ghinn 2019.) FDA has responded to the use of social media in clinical trials from a regulatory point of view. In 2011 and 2014 it released draft guidance concerning the benefits and risks of the various digital platforms. However, these seminal documents don't fully address how the current patients' and other stakeholders' social media engagement affects the performing of clinical trials and the regulatory viability of resulting study data. (Zupancic 2019.)

In all social media, the results of a successful trial are the most shared ones by the HCP's as they are looking for the positive breakthroughs. They are interested in the results, which prove the efficacy and safety of therapies that change the ways they practice clinical trials. On Twitter, HCP's mostly repost trial results published in prestigious medical journals. Between May 2018 to April 2019 the most influencing sources were the New England Journal of Medicine, the American College of Cardiology (ACC), The Lancet, and The Journal of the American Medical Association (JAMA). (Dogget 2019) In US, the number of HCPs using social media has increased notably over a decade. Charting today almost 300 million tweets and the number keeps growing (Ghinn 2019, figure 5.).

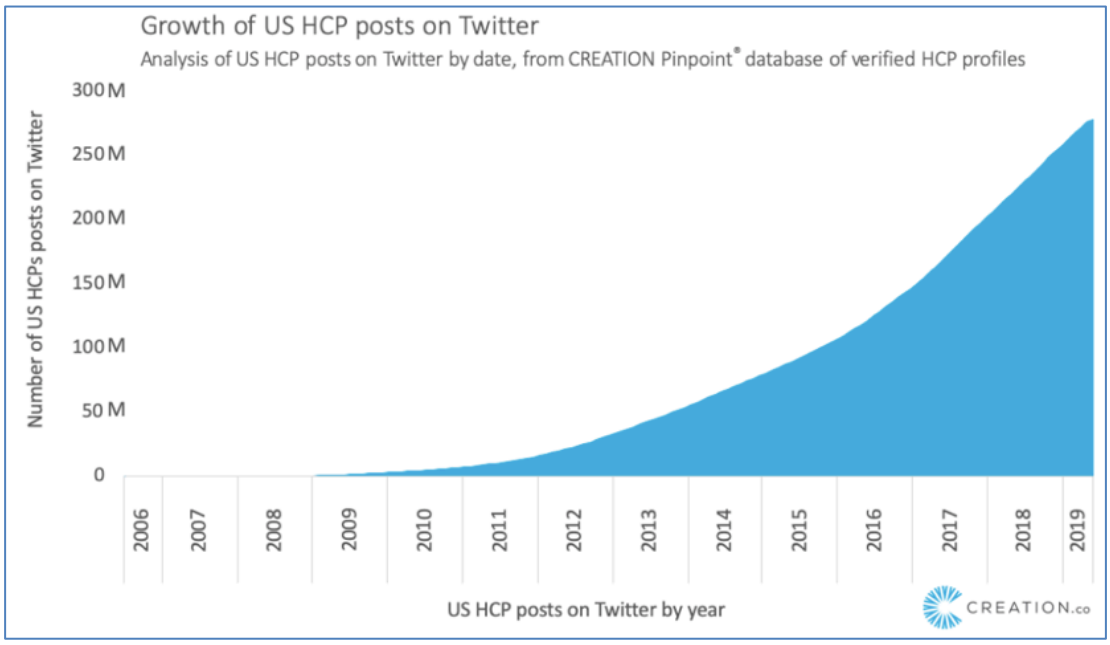


Figure 8. Growth of US HCP posts on Twitter (Ghinn 2019).

The tweets between professionals provide also a unique chance to follow conversations with arguments, opinions, questions etc. from those on the front lines of patient care. Oncologists in US have posted more than 2 million tweets. The start of using Twitter was a bit slower compared to the overall HCPs statistics, but the use has rapidly increased over the years. (Figure 6.).

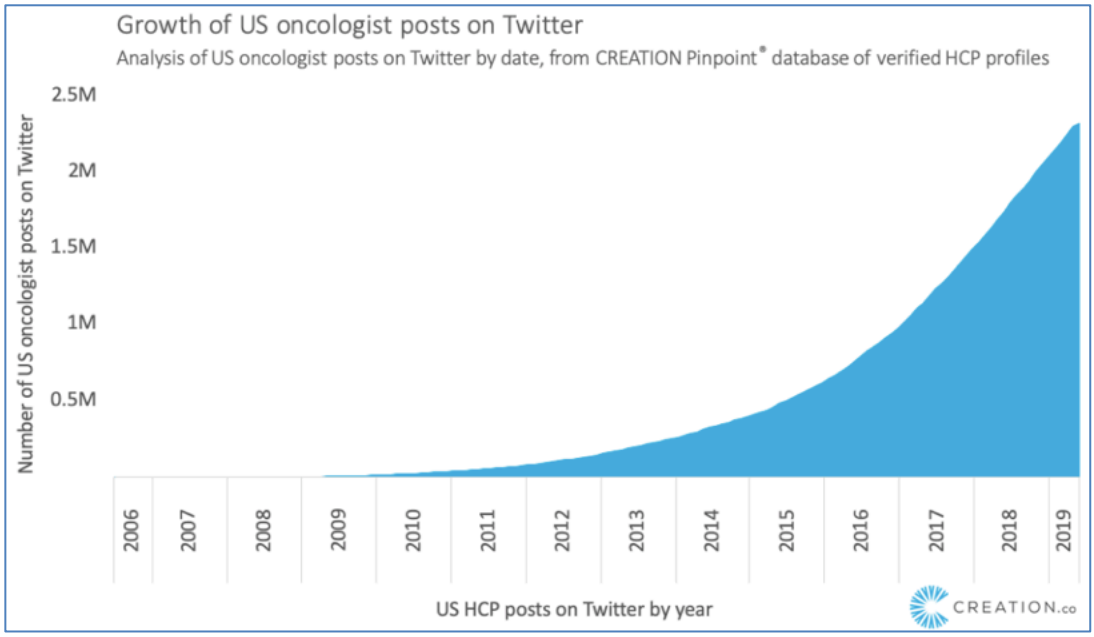


Figure 9. Growth of US oncologist posts on Twitter (Ghinn 2019).

There are many new alluring opportunities available for the research organizations as social media has become a primary resource for global communication. From an information management perspective the challenges consist of how to preserve the systems and protocols that maintain the integrity of the drug development process. For a researcher, who needs to build cohorts of hard-to-find patient populations, social media platforms provide an ideal venue. In the orphan disease area the patients are usually rare and widespread, so also those patients and their caregivers are desparately seeking treatments via social media platforms by connecting with other patients and support networks. (Zupancic 2019.)

Reseachers need key opinion leaders (KOL), who have significant academic credentials and experience in clinical trials. These are persons who give their expertice and knowledge to the trial. Digital leaders on the other hand are influencers in social media. The most active HCP's in UK discussions of clinical trials in 2019 were a trainee in intensive care medicine and sonologist Olusegun Olusanya and a cardiac radiographer David Wyant. They posted over 1000 times between each other about clinical trials and these posts were reshared more than 250 times. Still, the total number of the posts is not always relevant as for example a consultant respiratory physiotherapist Rachel Moses from UK posted only 23 tweet, but those were retweeted 314 times by other UK HCPs. (Dogget 2019.)

During 2020 the internet has filled with conversations and information about the devastating and rapidly spreading new virus, COVID-19. On the UK the social media platforms used by HCP all talked about a severe acute respiratory virus (figure 7.). On Twitter many awareness posts and links to the informational resources were shared. These tweets were addressed to their peers as well as to the public. (Cartwright 2020.)

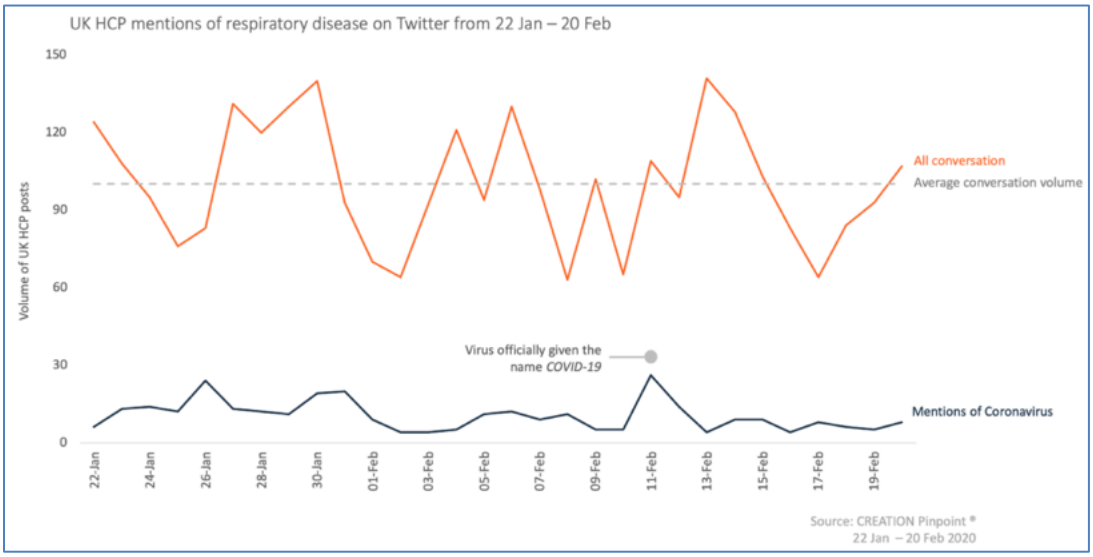


Figure 10. UK HCP mentions of respiratory disease on Twitter from 22 Jan – 20 Feb 2020 (Cartwright 2019).

While the digital media is a useful resource, there are a lot of vulnerabilities for researchers to understand. Openess of the communication is a positive aspect but in clinical research it introduces a new threat to its operations where regulatory and legislative requirements form clear privacy protections. To protect the vulnerable aspects of the trial, and mitigate risks, the researcher needs to properly coordinate and understand the nature of social media. (Zupancic 2019.)

3 COMMUNICATION OPPORTUNITIES FOR FARON

3.1 First things first – Training and planning

Good communication skills are essential in conducting successful global clinical trials. This demands for proper guidelines and trainings from the sponsor to all its internal stakeholders, who are responsible for performing the trial as planned. Faron provides good possibilities for its employees to participate in trainings to obtain the newest information and maintain their own expertice. It is very important that all employees are trained for communication as Faron is listed on both AIM and Nasdaq. Confidential and sensitive information must not leak outside the company.

To manage succesful trials, everyone in the organization and also the study site team members should be given at least basic communication training. Using options like e-trainings, webinars and online streaming saves money as there will be no travel costs for Faron. The level and topics of the trainings of course vary depending of the audience. Trainings should also include virtual working and communications. Each study should have its own communication teams to meet regularly to check the status and if something needs to be updated to the communication plan.

The communication plan needs to be be finalized before the beginning of the trial and it should also include crisis communication plan. Roles and responsibilities of all stakeholders of the study should be named by person, not by group, and updated immediately if the person and/or the responsibility changes. The MATINS study communication plan should be re-reviewed and finalized as soon as possible. The plan should also set some guidelines to sending emails as this was noted as a primary type of communication in the study. It would also be good to mention, if someone has had some communication training or has other experience in that area. The use of possible engagement technology or other engagement tools is important information to include in the plan.

The Internet and digital tools such as e-learning can help in making remote site qualifications for clinical trials by expanding communication and training opportunities to distant hospitals and clinics. All in all, clear communication lines and communication flow at each level is important for the cooperation between all stakeholders in the trial.

3.2 Catching the time robbers - Meetings and daily communication

Every work day is filled with little time robbers. Different time zones, nationalities and cultures, working styles and languages are challenges which need to be considered when meeting online. Different types of meetings should be defined relating to goals, attendance, and frequency, including an operational meeting at project team level to agree on day-to-day project planning and activities. Good manners and courtecy are easily forgotten in a busy athmosphere. As more and more meetings are held online and people are working remotely, there is a need for proper guidelines for virtual meetings and working at Faron.

Everybody knows, that you need to be in time and prepared for the meetings. The following meeting practicalities came up in the MATINS Project Managers interviews and were suggested for online meetings as opportunities to improve effectiveness:

- Using video connection people can observe each others gestures and expressions which gives a sense of face-to-face meeting and might lead to faster decision-making.

- Acknowledging the fact that not all have a scientific background, so using understandable terms when explaining the study concepts and challenges makes it easier for all to fully participate in discussions.

- If you are a presenter, show the commitment to the team support by sending team members simple reminders before the meeting to avoid communication pitfalls or prepare few slides to make information flow easier for all.

- Adjusting meeting times or deadlines to accommodate working hours of the team members across the globe or awareness of their national celebrations or holidays shows that each team member is equally important regardless where they live.

- Creating informative meeting minutes by listing decisions and actions clearly updates those who were absent and helps everyone to remember what was discussed.

Despite the popularity and benefits of online meetings, face-to-face meetings still hold a very important role in global clinical trials. IM gathers study members from all around the world to meet each other and learn about the trial. For the engagement purposes, for the experiences of pride, community and learnings these meetings need to be conducted face-to-face. Once people have met each other, it is easier to continue conversations over the phone.

In the research business everything needs to be documented. Many valuable conversations and decisions are made by email. For the study correspondence GCP guidelines and the study TMF plans set the rules for emailing.

Emails are used as a primary type of daily communication in the MATINS trial. As the communication plan has not been finalized and therefore roles and responsabilities have not been listed, most emails are going through the project managers. To avoid unnecessary emailing, it is okay to drop receivers from the chain, if you get a contact from the person providing you the needed information.

Basic rules for emails are good to include to the communication plan, for example addressing one topic per email. Use of smilies has increased in email correspondence even in the area of research which in general is quite formal. However, culture differences need to be considered when using smilies. In some cultures they can be very useful to reflect the right feelings but when used too much they lose their meening.

3.3 New technologies and programs

For virtual working there is no easy substitute if the technology fails. Therefore, choosing the right programs should be done very carefully. Different digital platforms provide new possibilities for Faron to conduct global clinical trials more successfully. There are a lot of options available to all fuctions in the trial. AI is definitely something to exlpore as it could significantly improve the enrolment performance when it is used through site selection platform. Also tools for remote-monitoring would be beneficial.

In supply the delivery of drugs and samples on time and in good condition needs constant planning, tracking and refining, so new and improved technologies are very welcome. IRT-system is one example of a new tool for managing modern multicenter clinical trials. Recently Faron has introduced IRT in the MATINS study and also integrated a function for cohort management in the system. However, the most challenging aspects come from the unexpected things like fast changes in the operating environment.

The well-being and engagement of the study sites are vital. The new engagement tools would give opportunities for Faron to show their study team members how appreciated and valuable their work is. Possibilities to encourage a little competition between the sites can lead to more efficient performances, like delivering the data faster and with better quality. This could also mitigate possible protocol deviations.

3.4 The alluring social media

The opportunities available in using social media to research organisations are too compelling to be ignored. For ultra-rare and rare disease researchers, the geographic reach and capabilities for targeted messaging present new means of accessing patients all over the world. Social media is also seen as a great tool for the researcher to obtain worldwide data for their studies. However, the media and people presenting the results there need to be critically evaluated.

All shared change of opinions, lessons learned and study result on social media can have a huge impact on the company's reputation and future studies. Therefore a proper research of social media, its pros and cons, is wise to do beforehand. The company should create a written guideline for social media use and clearly inform what you can and can't say, and how to react when facing something suspicious, which could be harmful for the company's image.

4 CONCLUSIONS

Good communication is a glue between every step and stakeholder in a global clinical trial. Therefore, it should be planned well and supervised from the start to the end of the study. However, there is no project, where communications wouldn't be a challenge. There is always a chance for something unexpected. As an example during the coronavirus outbreak people have had to adjust rapidly their ways of meeting and working. Increased use of virtual environment demands updated and supportive guidance for effective communication.

There is a fine line between success and failure in clinical trials. Despite of a well-designed protocol and innovative drug product, the trial can still fail. One reason is a lack of communication training. As Faron is listed on both AIM and Nasdaq, confidential and sensitive information must not leak outside the company. To manage trials successfully, everyone in the organization and the study site members should be given at least basic communication training. This would guarantee that people would know how to react if something unexpected happens. Using options like e-trainings, webinars and online streaming saves money as there will be no travel costs or other pass through costs for Faron.

Clinical trials include many approved applications from the authoroties and their timelines can be very unpredictable and sometimes long depending on the local regulations. This means, that the whole study is under constant development during the whole project, so management and planning must be very flexible and have the ability to react to coming changes rabidly. This also sets high expectations for the whole team. The study communication plan needs to be monitored and updated accordingly to meet the needs of unpredictable and rapid changes in the study.

Poor or unclear communication during the trial can damage the expected timelines. Understanding both the sponsor's and the CRO's internal pressure and other study related tasks would help all parties involve understand the importance of the clear requests informing why and by when.

Improving the quality of virtual working and especially online meeting practicalities listed in Chapter 2 would speed up the decision-making and build stronger trust and respect between teams. Still, face-to-face meetings should not be underestimated. They do increase the budget (especially travel costs), but the positive effect on teams can lead to more successful collaboration and this might pay off in the end. Especially meetings like IM are considered very important for its participants to meet face-to-face. As a conclucion, online and onsite meetings both have their pros and cons. Both are equally effective and necessary types of communication when performing clinical trials depending on the audience, meeting topics and goals.

Scheduling is one challenging task in research and development projects. Overall planning of the project requires several skills and knowledge of the business in general, but also realistic sense of the company's capacity and changes in its operating environment. Success can be found with constant and flexible planning, tracking and refining or by purchasing new technology to do it for you. AI offers fantastic solutions for smarter site selection, faster enrolment process as well as finding the right drug dose. However, it would be a huge single investment but in the long run, a profitable one.

Proper planning, trainings and research need to be done if Faron will consider expanding its social media use in the future. As pointed out in this thesis, the HCPs use of social media has risen year by year. A good influencer for Faron could be someone of the current KOLs or someone who has the knowledge on areas Faron is focused on. This person should be very well familiar of the virtual environment and all its benefits and vulnerabilities.

Skillful use of different social media platforms can be beneficial for study purposes, especially when building cohorts of hard-to-find patient populations. Via social media the company can also increase its awareness globally or obtain valuable data for the studies.

As a conclusion, challenges are many but so are the opportunities as well. Considering the opportunities previously noted in this thesis and what this thesis

provides as a result and exploring that carefully, Faron will be able to be even more successful in conducting global clinical trials in the future. All good and effective communication is based on open and honest discussions, and that is the key to mutual trust, respect and success.

The results of the study are reliably and valid. The information received from the interviews were satisfying and enough to make conclusions about communications in global clinical trials in general and when conducted by Faron. The interviewees have together 34 years of experience in clinical trials. The proper consents were received from both interviewees by email and the interviews were recorded, so to check the correctness of the answers afterwards is possible if needed. The other sources used in this thesis were peer-reviewed and published in professional scientific magazines and online forums. All references are suitable for this thesis' goals as they are as up to date as possible, published between years 2011 and 2020. Only exception is the 2003 published basic literature about project management.

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Theme interview I topics and consent

Turku University of Applied Sciences, Master's Thesis 2020
Communication Challenges and Opportunities in Global Clinical Trials
– Communicating with the Language of Science /Susanne Laakso

Interviewer: Susanne Laakso
Interviewee: Faron Pharmaceuticals Ltd./Clinical Research Manager Maria Jokinen

Consent for the interview: By email 2.4.2020.
Interview date and place: 8.4.2020, Teams online (recorded)

Interview topics:

- Introduction of the interviewee
  (name, company and current position, work experience in clinical trials)

- Faron study team internal communication
  - challenges?
  - opportunities?
  - case examples?

- Faron - CRO communication
  - challenges?
  - opportunities?
  - case examples?

- Faron – study site teams communication
  - challenges?
  - opportunities?
  - case examples?

- Future communications in global clinical trials
  (virtual teams, social media, AI and other technologies etc.)

Theme interview II topics and consent

Turku University of Applied Sciences, Master's Thesis 2020
Communication Challenges and Opportunities in Global Clinical Trials
– Communicating with the Language of Science/Susanne Laakso

Interviewer: Susanne Laakso
Interviewee: Simbec-Orion/Senior Project Manager Laura Gardner

Consent for the interview: By email 9.4.2020.
Interview date and place: 15.4.2020, Teams online (recorded)

Interview topics:

- Introduction of the interviewee
  (name, company and current position, work experience in clinical trials)

- Simbec-Orion and Faron study teams communication
  - challenges?
  - Opportunities?
  - case examples?

- Simbec-Orion, Faron and the study site teams communication
  - challenges?
  - opportunities?
  - case examples?

- General: Future communications in global clinical trials – new types of communication
  (virtual teams and working, social media, new technologies and programs etc.)