

#ImpatientRevolution

A guide for **impatient** patient organizations

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Preface

Back in 2011 I sent an email that would change my life.

When I was a child I decided that one day I would cure a disease, so I studied to become a scientist and work on drug discovery and development. And so I did. In 2011 I was working for a pharmaceutical company when one night, reading the news online, I came across an article about a child with a rare disease. His disease was one of the many rare diseases that have no effective medication, so his dad, together with a small group of parents, had just created a patient organization to find a cure for their children, all diagnosed with Dravet syndrome.

Before finishing the article I sent him an email. I knew about the brain, I knew about drug development, I knew languages and people, and I knew I wanted to help them. What I didn't know was the journey I was about to start.

During the following 5 years I worked with them to build a truly remarkable organization that is today a reference for other patient groups. I started as a volunteer, spending my nights, weekends and holidays working with them, and later left my corporate job to become their Scientific Director. In the process, I was able to observe what worked and what didn't, to adopt different strategies, and ultimately to come up with a framework for how patient organizations can shape the research field around their disease and influence the drug industry to work on their rare disease.

I have presented this framework at different international conferences on rare diseases, and each time I received very positive feedback from patient organizations and drug developers alike. As much as I love to share it with new people, I figured out I cannot continue to give the same talk over and over, so it was time for me to write it down and make the document openly available to the rare disease community.

This eBook summarizes the framework and includes some specific examples for how patient organizations can directly advance research and collaborate with drug development companies and regulators. I have written it as a guide to help the reader apply the theory and examples to their own rare disease of interest.

This guide does not address how to put together a patient organization, staff it, or fundraise. Instead, it focuses on developing treatments for rare diseases and shaping the ecosystem that is needed for those therapies to be developed. It is my gift for those who I like to call **impatiant patients** and the people who support them. For those who believe in the **impatiant revolution**.

Ana Mingorance, February 2017

Chapter 1: **IMPATIENT PATIENTS**

When a group of patients or caregivers first come together to create a patient organization, their goal is usually to find better treatments and a cure for their disease. And because they are not specialists in research, they often believe that their main contribution to research will be to raise funds and donate that money to researchers.

Here are some anonymized examples of such mission statements:

“At X organization, our mission is to raise funds to support finding cures for rare paediatric diseases. Our goal is to fund necessary research to help diagnose and find a cure for them - one disease at a time”.

“Cure X was created in order to raise funds necessary to facilitate research aimed at treating and ultimately curing X syndrome”

The same limiting belief of what patient organizations can bring to research is true from the research side. Once researchers approach clinical trials

they regard patient organizations as valuable disease information sources, which can help them select the best trial protocols and identify patients. But when they are still in early research stages, their view of patient groups is much more limited. Often, for an academic or early drug development scientist, patient organizations are mainly alternative sources of research funding.

Even when patient organizations know they can do much more, raising funds is often stated as the mission in their websites. And this is something I think we should challenge.



TOOLBOX 1

Review the mission statement in your organization website.

Does it list raising funds as your main contribution to research?

Once you read through the different chapters, consider going back to your website and updating your mission statement.

Why do we need patient organizations?

Perhaps the best approach to identify the real mission of patient organizations is to review why they exist in the first place.

When we are talking about rare diseases, those that affect less than 1 in 200,000 Americans or less than 1 in 2,000 people in Europe, the key problem is a numbers problem.

There are approximately 7,000 rare diseases. And when we are part of a patient organization it is because we have that rare disease, or we have a family member – often a child – with that rare disease, or because we are friends with someone who has that rare disease. And what we all have in common is that there is that one particular disease that we really want to fix.

But that is just **1 in 7,000**.

And most rare diseases don't even have a drug approved, let alone a drug that can treat the cause of the disease and not just the symptoms.

To make things worse, at the current rate of drug approval, **it would take us about 500 years before we have developed a drug for each of the 7,000 rare diseases**, so we could be waiting a long time before someone finds the solution for that one disease that we deeply care about.

This is what drives patient groups to come together, and why I like to call them impatient patients. Because they are the ones not willing to accept the 500-year sentence.



Chapter 2: THE DRUG DEVELOPMENT FRAMEWORK

Before we look into what we could do to accelerate the development of new drugs, we need to look into **the drug discovery and development process, what takes so much time, and why a company chooses to work on one particular disease versus another one.**

Why is the drug discovery process so long and so difficult?

If we don't want to wait 500 years to have drugs for all rare diseases, then we need to change something called drug discovery and development. That is not going to be an easy task!

The drug discovery and development process takes about 10-15 years and 1 billion dollars (that's nine zeroes) for each drug approved. And it takes that much time and money because the process has a very high drop out rate, so we start with many hopes and many ideas, but as each drug candidate moves from discovery to testing in animal models to starting clinical trials to then seeking regulatory approval, we have less and less that progress through each stage. The failure rate is so high that only 1 in 10 compounds that start Phase I clinical trials will make it to the market.

Think about it. A drug has to go through three stages of clinical trials:

Phase I, where healthy volunteers try the drug to learn about tolerability and body distribution, then **Phase II** in patients at a small scale to confirm safety and test for efficacy, and finally **Phase III** at a larger scale to confirm both safety and efficacy. If we flip a coin three times, once for each clinical trial stage, the probability of having heads three times would be 12.5%. In a difficult medical field like neurology, the probability of getting a drug past Phase I, II and III to obtain approval is just 10% – *less than flipping a coin and getting it right all three times.*

The orphan drug development framework

So knowing those numbers, now imagine that you are the drug development company, you have the time and the money, and you need to choose one disease. *Why would you end up choosing a rare disease, as opposed to a large disease? And why would you, among 7.000 rare disease options, select precisely the one that we deeply care about?*

I am a drug developer, and based on my experience in the pharmaceutical industry we always follow more or less the same decision pattern. I have consolidated this into a framework that

will be very useful later on to drive patient organizations' research strategy. So let me introduce you to that framework.

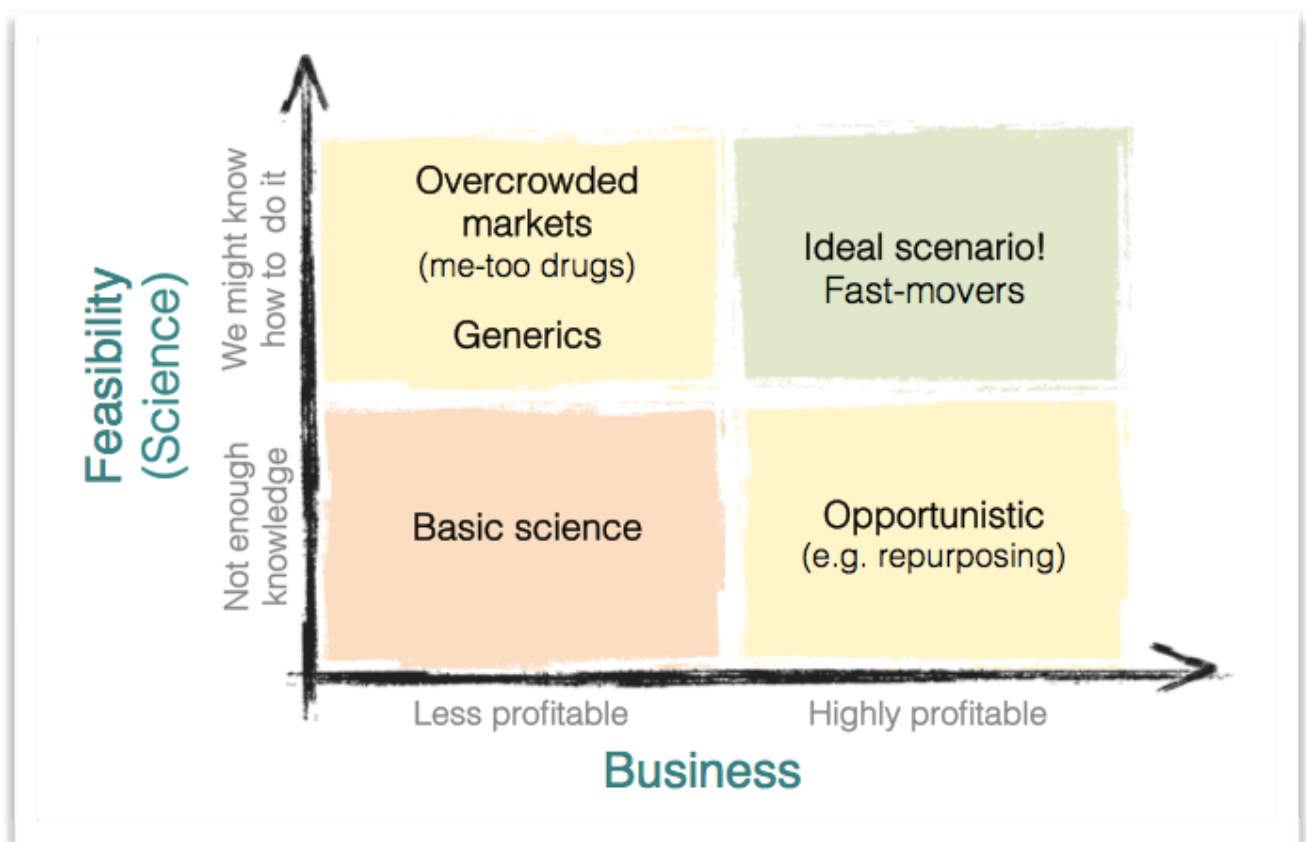
When you are a drug developer there are two main things to look at before you choose what disease you are going to work on. And the answer is not just "the most profitable one".

There are indeed **profitability (or business)** considerations when making that decision, but there are also **feasibility (or science)** considerations, such as: *do we know enough about this disease to make a*

good guess at what drug to develop and how to get it tested, or do we have no idea?

For each disease, the answers will cover a gradient, from very little profitability or knowledge and tools available, to large markets and a smooth drug development pathway.

If we use these two categories to **draw a matrix**, we can identify a number of boxes based on science and business considerations. These boxes highlight multiple reasonable business cases for companies to develop a drug.



Introduction to the drug development framework.

We can identify the following boxes or business cases to develop a drug:

1) High feasibility but small profitability. When it is easy for a company to get to the market in that disease, it is often easy for many other companies as well. This leads to not-so-profitable markets because the development (science) risk is so low that it attracts many companies. This is the usual business case for “me too” drugs, or generics, and many of the drugs we regularly use are in this box.

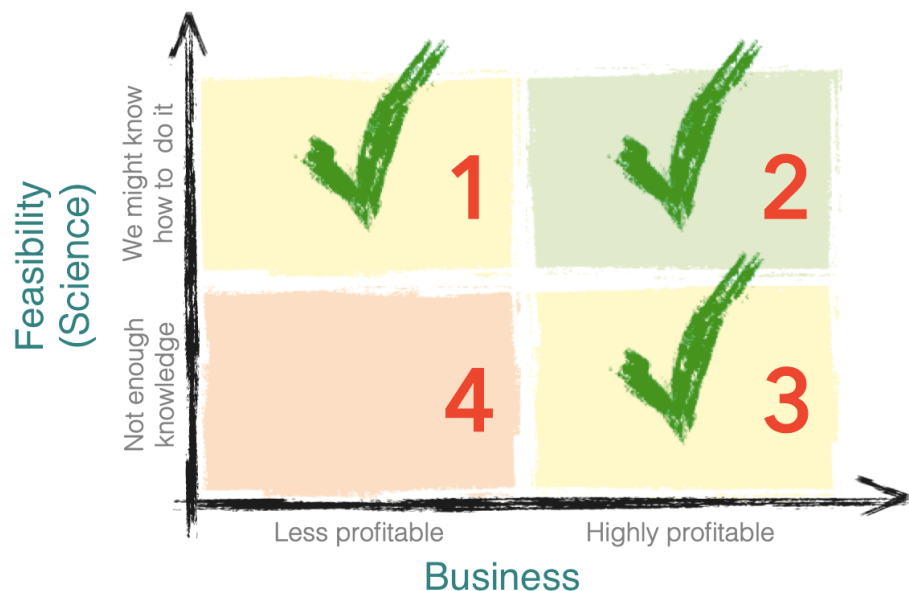
2) High feasibility and large profitability. This is the best combination: when you know the science well enough to have a good idea of what drug to develop and the development path is clear, *and* you are one of the first movers so there is little competition. This is the ideal scenario for drug developers.

3) Not enough science but large profitability. This is an interesting category where there is not enough scientific knowledge to link a potential drug with a disease, but somebody tried the drug and it worked. This is the

case of drugs developed for one disease that are later found to work on another disease, either by luck (e.g. identifying an interesting side effect) or by specifically trying approved drugs in new diseases. The best example are repurposed drugs, which are already approved drugs that are later approved for a new indication.

4) Not enough science and small profitability. This is the box of basic research, before drug discovery starts.

The important message from this exercise of going through the difference boxes is to teach you that **there are three different scenarios where it makes sense for a company to develop a drug.** You don't need to have a very large market with low competition to develop a drug. And you don't need to have the entire science path towards the market already defined in order to end up developing a drug for that disease. There are three good options that justify developing a new drug, and all of them help the company and help the patients.



Chapter 3: THE DRUG DEVELOPMENT FRAMEWORK APPLIED TO RARE DISEASES

The reason why I'm introducing you to this matrix is because as an impatient patient, you need to know what you should work on in order to beat that 500-year sentence. And you can actually use this framework to help you develop a roadmap towards that treatment.

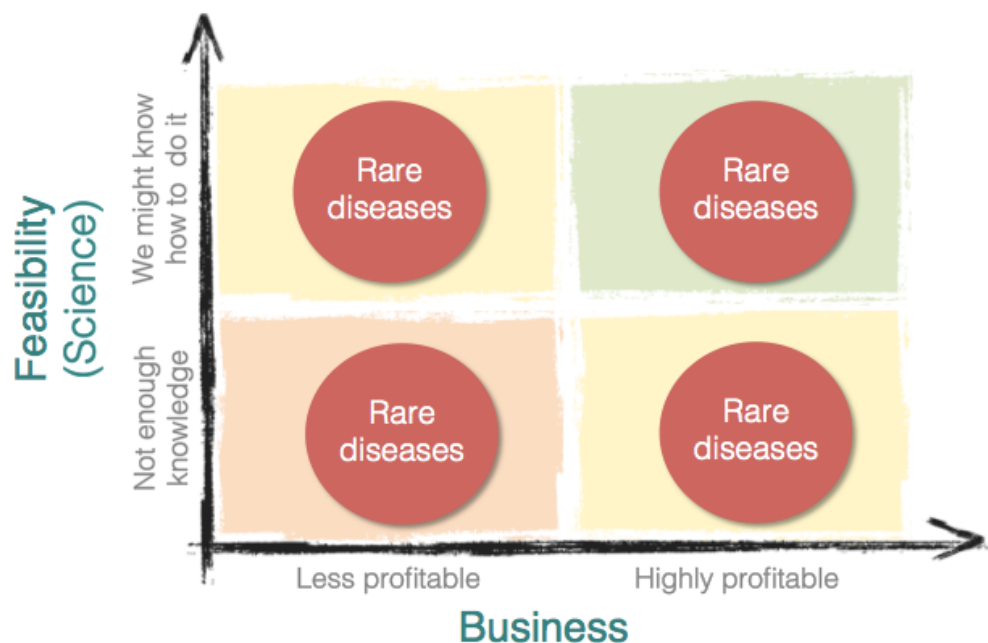
If you want to make sure a company will select your disease among 7,000, the first thing you need to know is where your disease sits in this matrix.

Where are rare diseases in the drug development matrix?

Before reading ahead, answer the following: *Where would you think rare diseases are in this matrix?*

Would you think they are relatively easy or difficult in the science axis?

Would you think their small market size makes them not profitable enough?



The answer is that *it really depends on which rare disease we are talking about*. They are not all in the same quadrant, and they change position over time.

Every patient organization needs to look at the field around their rare disease and ask themselves **if there is sufficient knowledge**, and **what are the most likely business reasons** for companies to work on that disease.

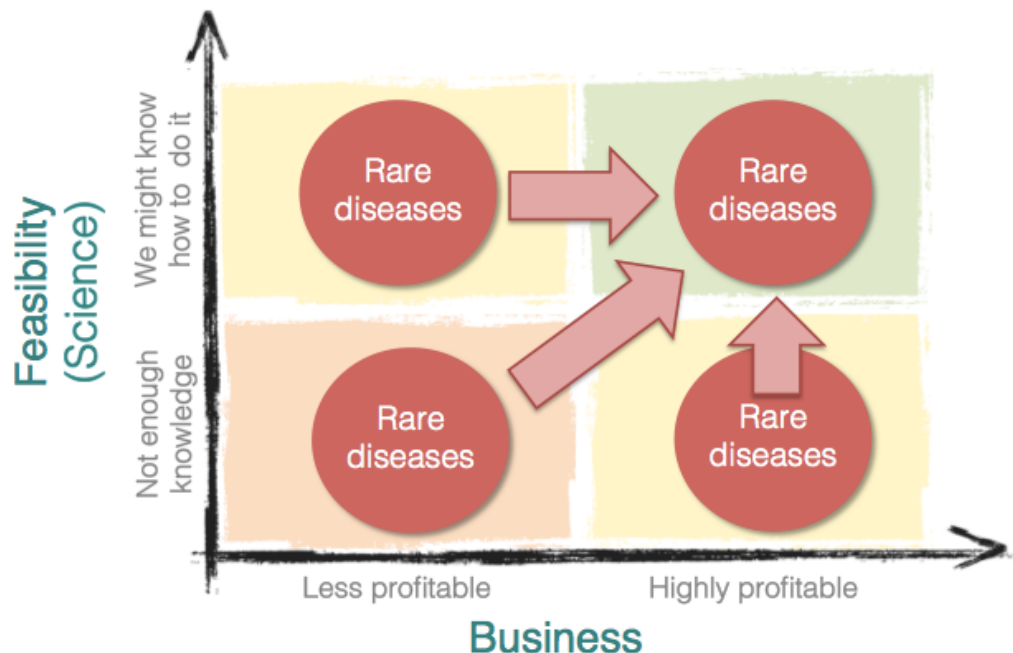
Once you know what your starting point is, you need to have a strategy to get you to the ideal box, the one at the top-right.

And because the starting point is different for each rare disease, you cannot just follow the strategy that some other patient organization followed for their disease. There will always be unique challenges and knowledge gaps in your own disease, so you need a unique strategy

adapted to your particular rare disease that will also evolve as you improve the science and improve the business in your specific field. There is no quick answer and you cannot just copy what other organizations have done.

Just remember that there are three good places to be. There is one better than the other two (top-right is always best) but you might chose to direct your efforts to the other two good boxes also, for example making your disease so easy to work on that many companies will, even if that makes them compete, or going after repurposing opportunities when the science to develop a brand new treatment is not there yet.

In the next chapter I will break down my recommendations on how to move your disease **higher in the science axis** and **towards the right in the business axis**.



Chapter 4: CHALLENGES ALONG THE SCIENCE AXIS

When I started working on Dravet syndrome I made a gap analysis. As a drug developer I knew what was needed to get a smooth path to the market, so I determined how mature that path was for this particular disease. This helped us focus our strategy during the following years, as it became our mission to get Dravet syndrome as high as possible along the science axis.

By telling you about what we did and some examples of other organizations, I hope you give you some ideas of how to get companies to work on your rare disease. And if you are not a patient advocate but a researcher or drug developer, then this will give you some ideas of how patient organizations can help you work on their rare disease.

The usual scientific challenges

Along with drug discovery and development, you need to have enough information and tools available to navigate four large stages:

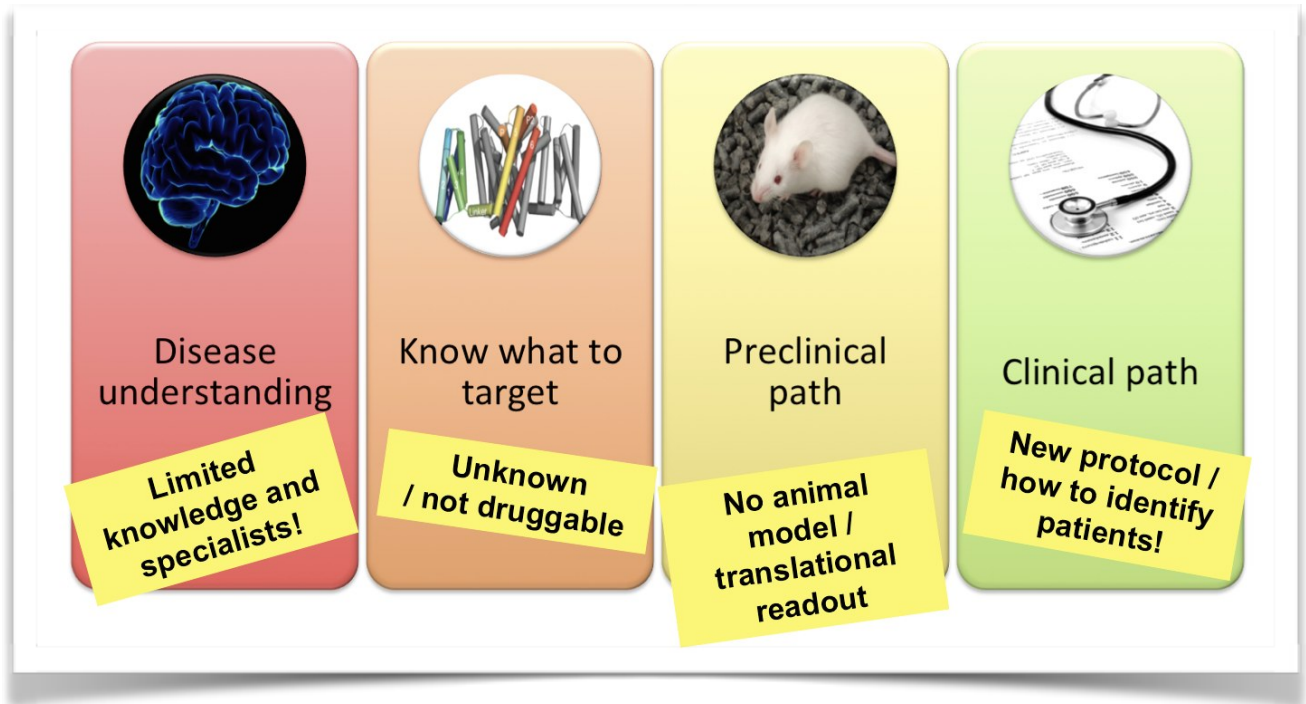
Disease understanding. You need to have enough knowledge of how the disease works in order to know what you should try to fix. Based on that, you might identify, for example, that

there is an important need to develop treatments able to reduce a particular symptom in that disease.

Discovery path, or knowing what to target. You need to have some idea of what gene, protein or process in the body you will try to modulate as a therapeutic approach. In cases where the disease has a genetic cause, the obvious target is the mutated gene or the protein that it encodes for, but in many cases this might not be doable.

Preclinical path. Before we can cure people we need to cure mice. And we need to treat many mice with an experimental drug before we dose the first healthy human volunteer. Because of that, one of the most important tools to develop a drug for a disease is the mouse model for that disease. It could be a genetic model or it could be a chemical model (when scientists administer a compound to the mice that make them develop the symptoms of that disease).

Clinical path. After demonstrating efficacy and safety in animals, it must be possible to test that experimental drug in patients in clinical trials. That requires not only recruiting patients, but also having the necessary clinical trial protocols.



The challenges for rare diseases

What happens with rare diseases is that they often have multiple gaps along this drug discovery and development path. And again, the situation is different for each rare disease. Some common gaps are:

- There are few specialists, so sometimes we don't understand how the disease develops.
- We might not know what to target, or if the genetic cause is known it might not be *druggable*, which means that it cannot be modulated with drugs.
- Often there is no mouse model, or it has not been properly characterized or made available to others.

- And in those diseases where there has never been a clinical trial before, then the first company to run a trial cannot be sure that they will identify enough patients or choose the best trial design and endpoints.

If you are part of a rare disease patient organization, I am sure you have identified one or more of these challenges for your disease. The exception is not to have gaps along the drug discovery and development path, it is to *not* have them.

As an impatient patient your job is to identify these gaps so that you know where your efforts and your money will make the biggest difference.

Chapter 5: **MOVING YOUR DISEASE UP IN THE SCIENCE AXIS**

During the 5 years that I worked with the Dravet Syndrome Foundation in Spain (DSF Spain) I experienced first-hand how we could change the scientific ecosystem around Dravet syndrome – from beginning to end of the drug development process – from our little organization. I will use our work as an example for what patient organizations can do to move their disease up in the science axis.

Keep in mind as you read the examples that this was a national organization, but we still made it our mission to make it so easy to do research on Dravet syndrome that we would have 300 laboratories looking for a cure. The size of your organization or the territories that you represent is no limit to what you can do when you want to cure a disease.

1. Education and awareness

At the most basic level, most patient organizations already do education and awareness – even the ones that are born with a social support mandate as opposed to research. But this is something that I would include in this list because it helps to get people interested in the disease, including researchers and physicians that

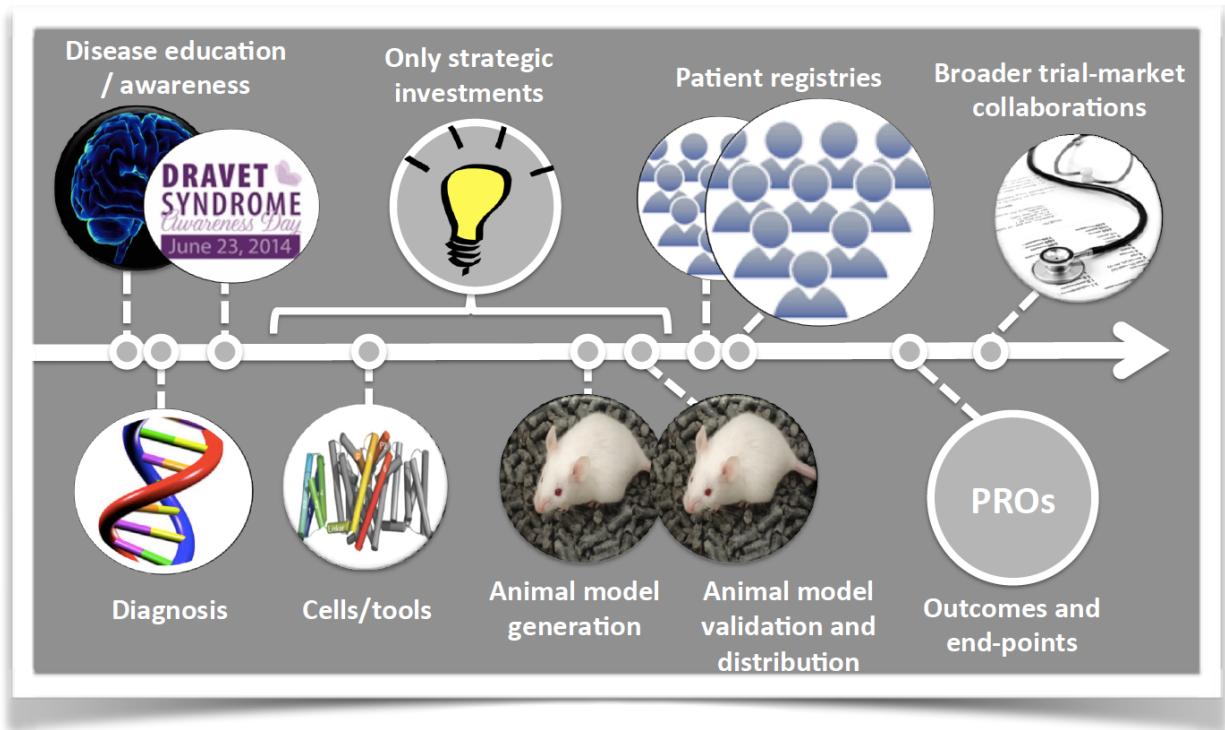
otherwise would not have considered that rare disease for their research or when looking for a possible diagnosis.

2. Diagnosis

A usual challenge in rare diseases is under-diagnosis. In many, we probably only know 10-30% of the actual people affected by that rare disease.

The reason is simple: rare diseases are rare, and often physicians won't think of them. In other cases diagnosis might be difficult if it requires genetic testing, because of financial considerations. This was the case of Dravet syndrome, so at DSF Spain we offered free genetic testing for patients with symptoms consistent with Dravet syndrome, coming from any country in the world. In other diseases, patient organizations have decided to invest in genetic research to identify new genetic causes when these are not clear.

Whatever your situation is, facilitating diagnosis will not only help the newly diagnosed patients, it will also help you grow the number of patients known with that particular rare disease, and this can be crucial for very rare (or ultra-rare) diseases.



3. Discovery research

We could indeed end up waiting 500 years if we funded many different individual research projects, so **it is very important to be strategic.**

Wherever you invest your money as a patient organization, it must address the gaps that you have previously identified for your rare disease.

This often means doing the “boring” science, such as creating research tools and making them available (cell lines, cDNA vectors, tool compounds, animal models, etc).

My recommendation to patient organizations – in particular in newly discovered diseases where the science is still immature – is to first focus on making sure these basic research tools are available. This will remove the main barrier of entry for scientists and companies to work on a rare disease, which is not lack of funding, but **lack of research tools.**

Once there is no barrier of entry and the main limitation for programs is funding, organizations can consider a venture philanthropy model. Probably the best example for how to succeed in this space is [CureDuchenne](#).

4. Mouse models

As a patient organization that wants to cure a disease, **make sure that there is a mouse model, that it is well-validated, and that it is available for everybody in the scientific community.**

It is important to remember that it is not the responsibility of a single academic group or a single company to take care of the entire field. So if you are part of a patient organization, it becomes your responsibility to do it.

When I made the gap analysis for Dravet syndrome, I identified the lack of an open-access mouse model as a major bottleneck. There were multiple mouse strains already developed but the original laboratories would not

share them, so I designed a new strain that is now available from an open-access mouse repository (like a “mouse Amazon” for scientists). As a direct result, there are now dozens of academic groups working on Dravet syndrome that we didn’t need to fund, and companies are now using these mice when before they would have chosen to work on other diseases.

Taking it one step further, rettsyndrome.org created the Scout Program to make it very easy for university scientists and companies to test their compounds in the Rett syndrome mice. The ALS Therapy Development Institute has a similar initiative, and both are excellent examples of how having access to good mouse models and facilitating access to them is one the best investments you can make to facilitate the development of medicines for a disease.

5. Clinical research

Another important time and resource investment if you are just starting off is creating patient registries and finding more patients. These registries will be very important for natural history studies (learning about the normal disease progression) and for knowing where to find patients for clinical trials.

6. Clinical trials

Our experience at DSF Spain was that sometimes the regulatory authorities might not have all the information that they need when it comes the time to design a clinical trial. *Is this age choice appropriate for the disease?*

Are the trial inclusion and exclusion criteria reasonable? How about trial size, should we ask for a trial in 20 patients or 200?

This is also an area where patient organizations can facilitate the process by giving this information to the companies developing drugs and to the regulatory authorities. In our experience, it was very useful to run patient surveys to collect epidemiological information, given that the medical specialists are few and in separate countries. We were much faster collecting these data directly from patients even in the absence of a registry, and getting the data published, which helped guide the design of clinical trials.

These are just some examples of what patient organizations can do to advance research that go well beyond giving money.

Just remember that it is going to be different for each patient group because the needs of each disease are unique, and so is not just about giving money, but about identifying those areas where your work will make the biggest difference.

Patient groups can do much as active partners from the earliest to the latest stages of drug discovery and development – partnering with scientists, with clinicians, with drug developers and with regulators.

As we move into the future we will see more and more impatient patient organizations that adopt this active role.



TOOLBOX 2: working on the science

If you are thinking about creating a patient group or foundation and funding research, then your priority should be to develop a clear strategy of where your efforts and funds are most needed and will make the greatest difference. *But who should develop that strategy?*

Traditionally, patient organizations focused on raising funds, and relied on individual academic groups to propose the projects that they want to pursue and on external advisors to select projects for funding based on their scientific merit. This researcher-initiated, or bottom-up, funding model means **the most important decisions (i.e research directions and how to spend the funding) are made by people external to the organization.**

All these external parties have their own biases (such as preferred approaches) and incentives (publish, prevent competition), and to be fair, it is not the responsibility of any particular university or company to

facilitate research in a particular field or to make it possible to have tomorrow 300 additional laboratories (or as many as needed) working on the same disease. That is actually the mission, and therefore the responsibility, of patient organizations.

So my advice to patient organizations, regardless of their size, is to internalize these decisions. Sit down with scientists, physicians, drug companies and regulators and identify what are the main gaps for developing medicines for your disease. The result is a strategic top-down model where the organization identifies roadblocks along the drug development pipeline and targets their efforts and funding to these critical gaps.

There is no better investment to make it possible to have 300 laboratories working on you disease tomorrow than removing bottlenecks and creating the necessary tools.

FRAXA's mission is to find effective treatments and ultimately a cure for fragile X by accelerating the pace of research. We can think of this like a major highway construction project: we aim to speed the flow of traffic (research) by eliminating bottlenecks along the route. Even the most complex processes have obvious choke-points that limit flow through the system. If these bottlenecks can be relieved, everything moves a lot faster.

A great example of mission statement, at fraxa.org



TOOLBOX 3: some examples

Q1. Has the disease that you are working on been described in only one or very few cases? Then you should make the identification of other cases a priority. This will help physicians understand the disease and get researchers to work on it.

You will need the help of physicians to produce the first scientific publications describing your disease. Bertrand Might was the first child ever described to have a disease caused by NGLY1 mutations. A few years after the initial publication there are more than a dozen patients and also research programs looking for treatments.

Q2. Do you know how many patients have the same diagnosis and where they are? Knowing this number will be important to get companies interested in your disease and to estimate clinical trials feasibility. Because of this, it is important to create patient registries as soon as possible.

If the logistics are too complex, even an Excel sheet and a group on Facebook will be enough to start.

Check out also EURORDIS and NORD, which provide a platform to create the first patient communities and information on patient registries.

Q3. Are there scientists and/or companies already working on your disease, but they are not involving the patient organization(s)? In my experience the best

way to ensure patients get to sit at the table is when the patient organizations organize the meeting and set up the table. Go ahead and organize a meeting where you set the agenda around your disease and invite academic and industry scientists to attend. That type of conference can also help you identify the main challenges for developing treatments for your disease (*toolbox 2*).

Q4. What is the first thing you would look at when studying potential gaps in a disease? The first thing I look for is the availability of a good mouse model. Many scientists and companies will choose to work on a disease if there is a good mouse model that they could have without restrictions, so investing in an open-access mouse model is a better investment than dedicating those funds to a single research project.

It is easy nowadays to make mouse models of genetic diseases, and most rare diseases are genetic.

If somebody has already generated a mouse model, ask them if they would make it available under open access. There are organizations that are like the "Amazon of mice" for scientists (see for example www.jax.org). Ask that laboratory also if there are restrictions for pharmaceutical companies to access their mice. If there is any restriction that the university imposes, then go ahead and generate your own mice.

Chapter 6: **BUSINESS CASE FOR ORPHAN DRUGS**

The development of drugs for rare diseases, known as orphan drugs, is “in”.

More and more companies are pursuing rare diseases as a strategy to develop more drugs faster, and much of that is powered by the passing of the Orphan Drug Act in the US in 1983, followed by similar regulations and incentives in the European Union in 2000.

But companies are not just chasing incentives, so it is important to understand when it might make sense for a company to choose to work on the rare disease that you have or that your patient organization focuses on.

As a group, rare diseases don't do too well in the profitability/business axis in the drug development matrix. This is because rare diseases are rare, and that means smaller markets. It is hard to compete with a disease that affects millions of people when your disease is measured in the few hundreds or few thousands.

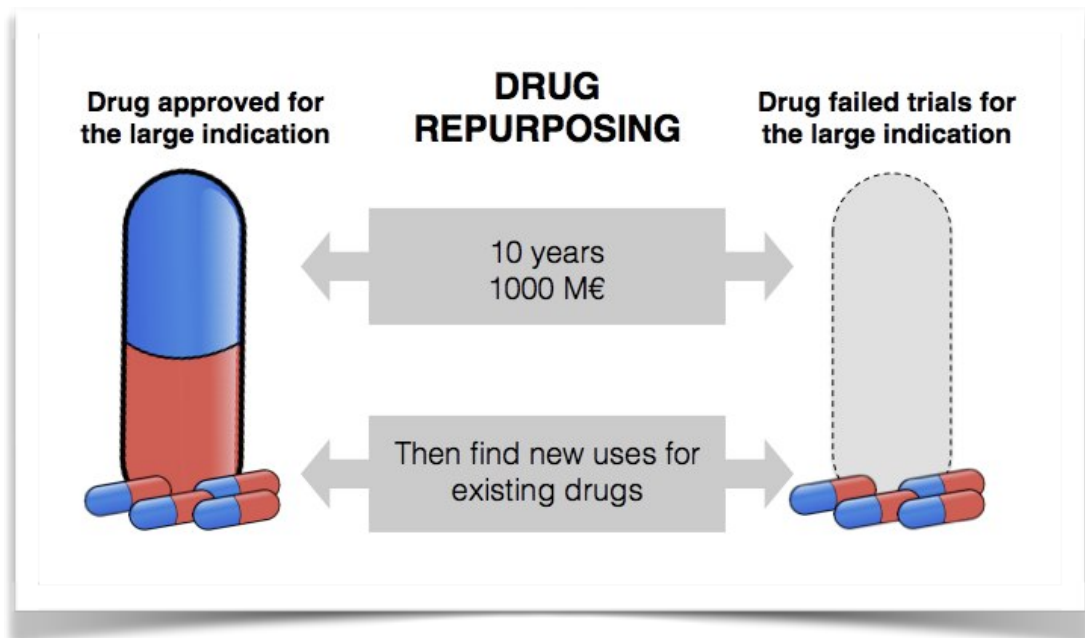
But there are some scenarios where it makes sense for a company to develop a drug for a rare disease, and the evidence is in the hundreds of orphan drugs already approved. I will focus on the three most common scenarios.

a) Some rare diseases are profitable

A blockbuster drug is a drug that makes over a billion dollars in sales per year, and there are many examples of orphan drugs that become blockbusters. This is possible because for some diseases the drug price could be in the six digit zone.

For example consider Soliris, for Paroxysmal Nocturnal Hemoglobinuria. There are only about 1,500 patients that could take it, but because it has a price of around \$440,000 per patient, the return for the company is comparable to successful drugs approved for large indications. Kalydeco, for Cystic Fibrosis, or Myozyme for Pompe disease, are additional examples of drugs that cost up to \$300-500,000 per patient per year.

How do you know if the disease that your organization focuses on is in this category? If the disease is lethal, if the treatment targets the cause of the disease (for example enzyme replacement therapies), then it is likely to be in this group. If your disease is chronic or treatments are largely symptomatic, then they are probably not in this scenario and we need to consider the options below.



b) Repurposed drugs

Another scenario is when the orphan drug has already been approved for another disease. This process of finding a new use (a new indication) for an already approved drug is known as **drug repurposing** and it is particularly common in rare diseases.

Just picture the standard process to develop a drug for a large disease. As an example let's pick Alzheimer's disease, where the failure rate in Phase III trials is exceptionally high.

By the time the company has made it to Phase III with that drug, they have already spent 10-15 years and one billion dollars in developing it. The money and the time are already gone. If the drug is successful, and it gets approved, it will then be interesting for the company to consider if they could expand their market to new indications, potentially rare diseases. And if the drug has failed the process and is sitting on a shelf in the company, then more than ever it is very attractive for

the company to explore alternative uses and look for a second opportunity.

So for companies that already have a clinical stage compound or an approved drug, testing their efficacy in rare diseases is an opportunity to either grow their existing market, or to try to recover at least part of their investment.

Some non-profit organizations such as [Cures Within Reach](#) and [Findacure](#) help patient organizations set up collaborations on drug repurposing.

c) Multiple indications for the same drug

The third example that I want to feature is when the company will strategically develop their drug for multiple diseases including at least one rare disease. In fact, developing a drug for multiple diseases is the best way to help justify the big cost and time investment of developing a new drug.

One version of this is when the rare disease is used as a **stepping-stone** before jumping into larger and riskier indications.

This is possible because many times a rare disease is like a model, or a simplified form, of a larger disease. So in the development pathway for a drug that aims to treat a large disease, often the company will consider if there is also a rare disease where they could try their drug first and de-risk the process.

For example the Alzheimer's drug that we hypothesized in the previous section might be acting on a protein that is also involved in a rare disease. In that case the company would be smart to make the strategic decision of trying their drug in a clinical trial for that rare disease first, to confirm that their drug is indeed modulating the protein the way that they want to. Rare diseases often need shorter and smaller trials than large diseases, so

the company will have their answer much faster and at a lower cost, de-risking the whole process. Because of this, considering a rare disease as a first indication is common when the ultimate indication that the company wants is a very difficult disease.

Another version of this business model is when the way the drug acts means it could be **useful for multiple rare diseases**. In that case the company will run clinical trials either in parallel or in a sequential way for multiple indications. An example would be Epidiolex (cannabidiol), which is being simultaneously developed for Dravet syndrome, Lennox-Gastaut syndrome, Tuberous Sclerosis Complex, Infantile Spasms and other forms of genetic epilepsies. Targeting one of these diseases might not have been worth it for the company, but as a group they make the investment more attractive.

Use rare diseases as a stepping stone before moving into larger (and riskier) indications

- Shorter time
- Less money
- Test mechanism
- Less risk



Or the drug mechanism makes it useful for a cluster of rare diseases

Chapter 7:

MOVING YOUR DISEASE TO THE RIGHT IN THE BUSINESS AXIS

So what can you do with all this knowledge on the different business models if you run a rare disease organization?

I believe one of your main jobs as an impatient patient organization is to sit down with drug developers and work with them to identify the best business model for them to work on your disease.

Ask them what would make them interested in your rare disease. This will help you identify the best strategy to follow. Often they will ask you for access to the mouse model to try their existing drugs or experimental compounds, so you should do your homework and have that mouse developed and accessible to them. Having the mice only at a university will not help you when finding a drug for you or your child relies on highly bureaucratic negotiations with university technology transfer offices!

Remember that there are 7,000 rare diseases. You want companies to pick yours over the other 6,999 rare diseases. You want it to be so easy for companies to test their drug in your disease that the only possible answer is “*sure, let’s try it*”.

You should also explore which of the scenarios of Chapter 6 best applies to your rare disease. *Is your disease similar to diabetes? Or Parkinson?* Then you might be a candidate for the stepping-stone path so you can explain to the company that is working on diabetes or Parkinson’s how your disease could be part of their clinical de-risking strategy and how you are willing to get them the tools and contacts that they might need.

In this case you might want to dedicate some efforts to positioning your disease as a monogenic version of autism, for example. Or a nice entry-level form of epilepsy. This will drive to your disease those companies that are interested in the larger disease because they are not investing only in your little disease but in the larger picture.

Or is your disease very similar to other rare diseases? In that case it would make sense to approach the companies already working on those rare diseases and explain to them how they could easily transfer all what they’ve done in those related diseases to a clinical trial in yours and optimize their return on investment.

In the case of **drug repurposing**, the drug company is probably not thinking of your rare disease, so patient groups can play a crucial role by approaching the company and asking them to try their existing drug(s) in their disease.

Some companies like [Healx](#) and [Perlara](#) actually partner with patient groups to help them identify promising drugs to repurpose for their disease.

Repurposing is a win-win for both parties. You are not asking a drug company to believe so much in your disease that they should devote an entire research program from scratch to it, but simply to give their existing drugs a try. This solves the problem that the company has today, which is

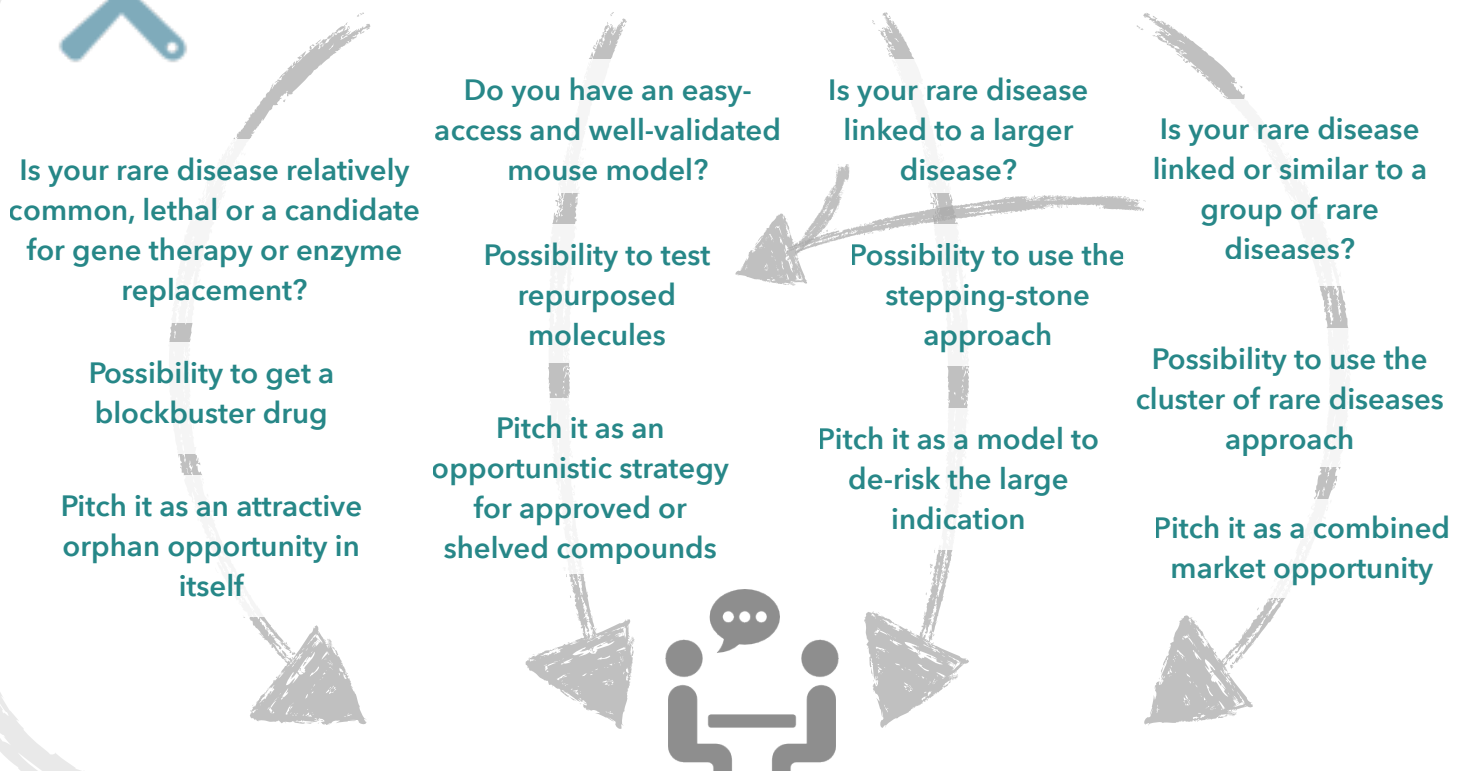
to identify more uses for the drugs they have in the market or in development. And it solves the problem that patients have today, which is finding out if there might be a drug already developed that they could use tomorrow.

These are some examples of what you can do to learn to see your disease from the company side and use that knowledge to position your disease in a way that makes commercial sense for the company (*see also toolbox 4*), moving it to the right side of the matrix.

Do not limit yourself to giving money to researchers. Think also of the business, sit down with pharmaceutical companies and recruit them to your disease.



TOOLBOX 4: working on the business



Closing remarks:

THE ROLE OF IMPATIENT PATIENTS IN RESEARCH

After reading through the different chapters, do you still think that the main role of patient organizations in research is to raise funds for research?

The role of impatient patient organizations is actually more complex but also much more powerful than that. It is to **have the vision** (know where your disease is in the matrix), **have the strategy** to fill the gaps (build the science and build the business) and **be the glue** that connects all stakeholders so that you don't have to wait 500 years to have an effective drug.

So, put together a working group to find where your disease is within the matrix and how to fill those gaps, update your website to reflect your actual mission, and feel free to contact me if you need any help to adapt this framework to your rare disease.

Join the #ImpatientRevolution

“The mission of impatient patient organizations is to have the vision of where their disease is within the matrix, have the strategy to fill the science and the business gaps, and to be the glue that connects all stakeholders around their disease”

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