

Dr. Marinelli:

Hey, everybody. Welcome back for another episode of ENT in a Nutshell. My name is John Marinelli, and today I have the privilege of hosting a special episode which we have entitled Research and Journal Publications: Why and How, with special guest, Dr. Matt Carlson. Dr. Carlson, thank you for being here today.

Dr. Matthew Carlson:

John, thanks for having me.

Dr. Marinelli:

So today we're going to try and touch on a number of different high yield topics related to research, covering everything from selecting a mentor, selecting a research project or idea to writing the paper. There're sometimes awkward situation surrounding authorship as well as just pragmatic things related to journal selection, submission, the review process, that thing. But before getting into that, I just wanted to briefly introduce our guest speaker. Dr. Carlson is a Neurologist at a very large tertiary referral center here in the United States. He's also a fellowship Director of Neurotology at his program. He is the author of almost 300 peer reviewed publications to date, author of several books, as well as PI on several different grants, including some large ongoing clinical trials. And then perhaps most importantly, he has mentored countless medical students, residents and fellows on this topic related to research and early career development.

And so I think this episode will be very practically useful. So Dr. Carlson just to get started, though, I want to take a step back and ask the question, why engage in research to begin with? I think a lot of times, especially amidst a very busy residency scheduled it's easy to lose sight of why we're doing it. Then oftentimes, people feel like they don't have the time to really put a lot of effort into research. So can you tell us a little bit about why you think it's valuable to engage in research early on?

Dr. Matthew Carlson:

Thanks, John. That's a great question. I totally agree with you. Particularly as a resident we always say that we like to balance research education and clinical care. But in reality as a very busy resident clinical care takes, consumes almost all of our time. And then what's left over, unfortunately, is relegated towards taking care of yourself and exercise and things like that. And the very last is typically what we spend on research. And so it's often deprioritized, it's difficult to really balance things. I think when you think about why is it important to do research, I think there's a lot of different ways you can answer that question. But most broadly, it really encompasses one of the three cornerstones of academic medicine, and clinical care research and education. And I think later on in your career, some of the most self rewarding aspects of research are, come along with the idea that you came up with an idea, you came up with a project, you saw it through and it resulted in a positive change in your field directly.

And most importantly, it resulted in improvement in patient outcomes. That really is the end goal of researches to advance medicine and most importantly, improve patient outcomes. But beyond that, there are some more immediate benefits. Some more tangible benefits that we can consider and really definitely do impact us early on in our career. So why is it important? Well, research really makes you or forces you to study a topic in very deep depth. It's not like you're just reading a book chapter superficially in Bally's or Cummings, where you might retain two or three important facts and that's it. To really write a research project, to write a paper and to do the background work really forces you to know the topic extremely well. And I would say some of the best or some of the deepest learning I did as

a resident, in fact, was related to the research projects I was working on. I retain that clinical information a lot better.

And so in many ways, it makes you a better clinician. By studying background data and designing a research plan and drafting a manuscript become ... you also become a much more efficient reviewer of the literature. It's a skill that will benefit you throughout your career. So you can read a publication quickly understand based on the study design, population context, whether or not it really applies to you whether or not it was done in a quality manner. And what biases or confounding factors influence the conclusions, which obviously, are significant issues with any research. Very early on in your career in you publish on a specific topic over and over, you can actually quickly become recognized as an expert on that subject. And as you get better and as you know more about that topic, each successive project related to that becomes a lot easier. So research is really important part of early career development and that's defining your niche within a specialty.

And then whether you want to admit it or not, publications are really one of the most important intangible measures of academic productivity. Anybody can work in a lab over summertime. Anybody can be a fifth person on a project but for you to see or start something, see it through and have a publication at the end demonstrates determination and commitment. And I would say just as a general rule as residence list ... if you're a resident listening to this right now, if you can just do this simple thing if you don't take anything else away, just really focus on publishing one or two reasonable quality papers each year. And try to be first author on one of them. And that will really help strengthen your fellowship application and your future academic job application. So when we talk about the number of publications you have and how that looks on your CV.

It's not just that you want to have 100 case reports, you want to make sure you have some papers that are high impact, and you might have some that are less impactful, and you have a balanced curriculum vitae. There is something that I'm sure you'll hear about along your research journey, and that's the h-index. And that comes and goes in and out of style. But I think it's worth at least knowing what it is. So the h-index is assigned to you, each individual person will have an h-index. And it's based on the number of publications that you've had. But it also weights them according to the number of citations that you've had. So how this is determined, you can actually look up on Google Scholar, for example. And determine your h-index. But how it's calculated is you'll take all of your publications you've ever done and put them on individual rows.

And you'll put the publication that was cited the most frequently on the top, and you'll successively move down to the one that was referenced the least. And the row number that matches the number of times a certain one was cited or referenced is your h-index. So in other words, if your 30th row was referenced 30 times that would be your h-index. Your h-index would be 30 in that example. And it's not a perfect measure, it has its limitations. But it is a good way to balance and control for the people that just publish our papers that aren't impactful. And also benefits those that publish more impactful papers, but just not as many. The last thing that I think is still worth mentioning, when we talk about the benefits of researches it's a really an indirect advertisement for you and for your department in your institution.

Patients in particular are becoming a lot more savvy. And it's very common that a patient will read the literature and even the scientific literature, and may even come to your clinic to practice as a self referral, based on some research or some publications that you've done. And certainly I get emails from patients not infrequently, and I do see patients who will come to clinic and make their appointments just because they saw that I published on something and I had particular interest in a topic. So a lot of different reasons why you'll consider research. Some are more long-term and more

altruistic, and other ones are more about your individual career development. But for many reasons, it's important.

Dr. Marinelli:

As a trainee, often, we can't really even engage in research without first identifying a mentor. And identifying a mentor can end up really being a deal breaker in terms of our research success and our experience. Can you talk a little bit about how to identify a good mentor for research?

Dr. Matthew Carlson:

Absolutely, that's a really critical question. And I want to start by saying there's different types of mentors, we've all had and you will have during your career. Those are, they could be somebody who gives career advisement or personal advisement. We all go through situations where we're trying to balance everything, our clinical care, our research, our family time, our personal time and in many ways you'll get good advice from different people. But specifically, here we're talking about a research mentor. Naturally, most people will think that the best research mentor you can have is someone who's the most well known, that's still accessible to you. And this might be true, but it might not be. Oftentimes, these people are very well known or often just very busy. And they might not have the time to go through all the steps of the process with you in the detail that you might need, particularly if you're just starting out.

And they're also more far removed from the earlier processes that some of the things you're struggling with. And so, again, just a general rule of thumb. But oftentimes, a person who's mid career or even early career may be a very good mentor for you, particularly if you're just starting out on research projects. There are different types of people if you're a self starter and you really have been doing, if you already done some projects and you feel like you've done well at them. And you've been successful and got some publications on your belt, it's not unreasonable to also work with some of these more well known people. Because of course, networking and connections are also important in academia. But again, as a general rule if you're just starting off, I would really try to focus on the early and mid career person.

Another very critical aspect is the productivity of your mentor. So if you're working in a lab that only produces, or finishes one project or one paper every two years. You're not likely going to walk away from that experience with a number of publications and you want to have quality. But you also want to have some level of quantity because they're both important in different ways. And so, you want to find that balance. You want to find somebody that can work with you who's reasonably productive and somebody who's aligns with your interest and also your personality type.

Dr. Marinelli:

When talking about being productive, I think that one of the biggest challenges as a resident especially in ENT is the reality that residency is very busy. Often, I thought about working in teams and trying to get a gauge of what's useful at your institution can be something that might facilitate research. But can you talk a little bit more about how to work in a team and take advantage of what's around you?

Dr. Matthew Carlson:

Now, I think that's really a critical aspect. And a lot of these things we're talking about now are very much, based on my personal experience some things I've learned the hard way and other things that I felt like I fell upon luckily. And I think there's a lot of different ways to think about these things. And so

for me one thing that just naturally happened that I felt was in hindsight very, a very good thing was during residency, all through residency each different PGY year I'd have one or two, or maybe two or three residents, who I identified with and who had similar research interests and also had a similar level of enthusiasm for doing research. And we just had a very good synergistic relationship, we tagged in different projects. And so one person might be leading a project and you'll provide a critical review or you might help identify some of the data.

And then conversely, you could add a different paper. And that relationship allows you to be more productive, it also helps with idea generation brainstorming. And frankly, it's just more fun to work in a group of people who are also enthusiastic, I think everybody feeds off of each other with that infectious enthusiasm. And so for me, that was really beneficial. One thing I've realized working at the institution I do, is that it's a very big institution. A lot of times it's just all about trying to find people in different areas that are sub experts in different topics. So if I wanted, I'm not a ... my undergraduate degree was in molecular biology and genetics. But I'm certainly have no PhD at that. And I've been so far removed from bench research in this area that I need to collaborate with other people. So I did a recent project looking at deep sequencing of the NF2 gene in vestibular schwannoma.

And I identified a group in our institution that was very knowledgeable and interested in collaborating. And so know your institution, know the resources that are there. And a lot of times people in the PhD lab needs someone like you, and they need somebody who knows the clinical questions. And together you form a good team. And so identify who's out there and don't try to reinvent the wheel, work on other people who already know the different aspects of research. At my institution, for example, we have a great epidemiology database that we've tapped into several times. We have an outstanding anatomy lab, a temporal bone lab, that we can do image guidance and do different special scans on and we have very nice videography and photography equipment for anatomical studies. There's just, I think it's really important to think about what your resources are at your institution and try to take advantage of those as much as you can.

Dr. Marinelli:

In transitioning a little bit now, how do you identify a good research topic?

Dr. Matthew Carlson:

So, it's a good question. It really depends on where you are in your career. And if you've developed your decision to pursue a certain sub specialty or fellowship, et cetera. In your PGY-1 through PGY-3, in particular, a lot of people are still an open book. And they're really deciding on what direction they're going to go. And it might even create some level anxiety because you say, well, what should I be researching? I don't know what field I'm going to go into. Early on what people are looking for in a curriculum vitae or CV or your application later on for fellowship, and jobs, if you're doing academic job. Is that do you have an inquisitive personality, you're driven and that you're consistent in your research work.

And so even if it's not specifically on the topic that you ultimately end up going into, that's okay. If you are, if you have declared what you want to go into or you're further along in your residency, it is advantageous to focus on areas that were going to help you later in your career. But again, it's not an absolute critical aspect. I will say that just as a cautionary note, anything that you publish stays with you. So if it's a really hot topic or a sexy topic, like maybe cleft palate surgery or cochlear implantation or transoral robotic surgery, you really have to publish 20 or 30 papers in the area for you to even be recognized for your contributions many times just because it's such a popular topic. But if you first

author on an undesirable topic, that might stick with you and you might be asked to give international, you might get international referrals or be asked to talk about this on podium talks later on.

So it sounds very funny. Again, the ultimate goal is to provide better patient outcomes and patient care in the future, but you should be a little strategic about what you're going to publish on. When you're first thinking about an idea, you have to really think about what's the angle? What's the hook? Why are people going to want to read this? You want to present it in a way that grabs our attention to some level. Because the same thing that grabs the attention of the reader will grab the attention of the reviewer. And in general, to get published in a decent subspecialty journal in otolaryngology, you have to have one of three things. You have to have a large number relative to the disease. So if it's a super rare thing, it's okay if you only have 10 patients maybe. But if it's more common, you have to have more patients. Look for something that's Nobel, something that hasn't been really studied very well.

Of course, being able to repeat data is a critical part of all science. But if it's been studied several times before, it's just less Nobel. Or think of a new spin on an old topic. These are the, as far as what the hook is, what will get published. These are things that are important to consider. Before you're starting your project, think about what your institution has to offer. If your clinic or your group has a very robust esthesioneuroblastoma referral network, then that be a really good thing to study. But if you don't get a lot of referrals for a specific disease topic, it might just be difficult for you to just study it very well or come up with a reasonable paper. When you have an idea and you've established what you think the hook is, make sure you really comb through the literature. Spend a good half an hour or even an hour really looking through your literature. The saying is, there's nothing new underneath the sun. And it's true, if you've had a really good idea chances are somebody else has looked at it, but not always.

And even if they have, it's not crazy to repeat it. Or particularly if you can have a new spin on it. But spend some time looking in the literature early on because it might save you a lot of time later. When you're actually starting your project. And you're starting to design your research project, and you're determining what variables you want to collect. That initial literature review is also going to be very helpful. Look at the variables other people have studied or analyzed when they'd researched the same topic. Think about it, mull it over, send it to others to evaluate. And then look at it again and send it to your mentor because there's nothing more painful than being halfway through your project and deciding that you want to collect more variables.

And a prospective study can be a deal breaker. In a retrospective study, it just means you're going to go through all those charts all over again. And I still do this sometimes, but I have become more and more deliberate over time to try to really think about that aspect. And then before you start, it's always a good consideration, particularly for comparative studies to look at, to do a power analysis.

Dr. Marinelli:

Yeah, I think that's really great. One thing I noticed over the years working together, that's worked out really well is having an umbrella IRB, where we can do multiple studies that all fall under one overarching topic, and it just speeds up the process. You don't have to wait several weeks or write a new IRB every time, a new study protocol, wait several weeks for the board to review it to just ... you have a new idea that often comes after doing a project. And you can just start on it right away and not waste any time. But then the next topic I just wanted to touch on was, especially as we think about productivity and being efficient with our time and residency is just the different types of research we can engage in. Can you talk a little bit about all the different types of research out there and your thoughts on those?

Dr. Matthew Carlson:

So that's a great question. We've all seen the evidence ladder all the way from randomized control trial down to expert opinion. And as with everything in life, the more work that's put ... the more meaningful something is, is oftentimes directly related to with the amount of sweat that's put into it also. And when you think about a project, and you're thinking about should I be doing a randomized control trial, a controlled longitudinal study and uncontrolled longitudinal study, a cross sectional study or just an expert opinion project? You really are thinking about balancing the feasibility of something and the scientific merit of something. Of course, a randomized double blinded prospective study with 10,000 patients comparing coblation electrocautery tonsillectomy is a lot better than an observational study with only 200 patients.

But, the latter is much more likely to get done during your residency or even during your lifetime. And so you really have to balance these two things. A cold truth is that if you don't publish it, it didn't happen. And a lot of people will say the process is valuable, and I won't argue with that. I do think the process is helpful. But at the end of the day, if you don't publish it the idea is not out there. People can't try to repeat it or build upon it and certainly for you on your resume or your application, it really doesn't matter. As we alluded to earlier you can say, in some ways saying you worked in a lab for two and not having anything to show is almost worse than not even working in the lab to begin with. Because it just shows that you were there the whole time but weren't able to produce anything.

And so on many levels, you need to be a finisher as much as you can try to get something out of your time there. When you're thinking about building your resume. We discussed this earlier, but nobody has giant randomized controlled trials as their only publications. You'll have a mixture of case reports, retrospective reviews, prospective studies and that's what's expected. Our goal in our field is to try to research, improve the quality of the research and evidence. But the reality is when you're early on beginning the process, just working on some of these lower evidence type studies or study designs, also just helps you get your feet well, it helps you become a good scientific writer. And I think it's a very reasonable way to go about it.

Dr. Marinelli:

One topic that, I think especially when starting out, if you haven't done much research can be a little bit daunting is just the topic of good research etiquette. Often, it takes several papers to get an idea of what does authorship typically look like, how does that interaction go? Can you just touch on what good research etiquette is in your mind?

Dr. Matthew Carlson:

Yeah, so it's true. It's sometimes can be a sticky topic. Sometimes people will have the feeling that they did most of the work when, in fact, they might not have. Some people might feel that most of the patients being cited were their patients. And so they should have a good position on a paper or and there is a lot of truth to these things. It's just that it's sometimes as a sensitive topic. There is an actual guideline for authorship that we're, as scientists supposed to adhere to. It's the International Committee of Medical Journal Editors. And there's basically four criteria that you're supposed to meet to technically be an author. But practically speaking, these items are barely followed, but just demonstrates that you have some level involvement. So you're supposed to have significant involvement in a study conception, data collection and analysis.

You should have involvement in drafting or revising the manuscript, you should approve the final version of the manuscript. And then ultimately, you're responsible for the accuracy, integrity of the

data. And those are the official guidelines. One of the questions that always comes up is what's the most important positions on a paper for authorship? In general, first author is the most desirable position. There is a situation where you can denote an asterisk for being co-primary first author, it's not done very frequently. But there are some unique situations where two people might have contributed equally to an important paper. And so it's a reasonable thing to do. The second best position on a paper is controversial. And it probably depends on where you are in your career.

Usually, the second author indicates that you've done the second amount, most amount of work on the project. And for most people particularly early on, that's the second best position. Usually, the senior author or the last author is the PI or the head of the lab. And that can also be a desirable position, that's usually typically more of a position for somebody who's a little bit further along in their career and providing larger oversight, but not doing as much directly in the project. But different groups will look at this differently. And it's, there's definitely not a right or wrong answer. Typically, the corresponding author can be any, can be an author anywhere in the sequence of the paper. Typically, the corresponding author is often the senior author but not always, or the first author. But it usually should be assigned to this functioning study PI or the head of lab, that should be assigned to somebody who's going to be around that data for a while.

So sometimes you'll get a letter back to the corresponding author asking a question about some of the data a couple of years later. And so it's helpful to have something that's going to be there for a while from that perspective. It's a little awkward, but sometimes it's just better to have the conversation up front and define people's roles on the project. And then outline the expectations of the first author. Particularly when you're just starting out in doing your research. It's difficult to really know what the expectations are. What's expected of you, what's expected on other parts, other members of the team. And if you have that conversation up front then you can say this is something I'm very interested and I'd like to lead this if it's okay with the group and this is what I plan to do. And if you divine that up front, and you follow through on that it ends up being a much more healthy and viable long-term relationship.

There's no question that being collegial is critical, particularly when you're working in a group of people. If you found that good research team, there are plenty of times I've worked on a project where I felt I did a significant amount of the work and sometimes most of the work but I wasn't first author. I've been a middle author and completely rewritten papers before, all of us have been in those situations. And but, as it in general, it all balances out. Sometimes you'll be in a position where you're put on a paper and you're not doing as much work as many of the other people are on there. So it all averages out. So the general rule is play nice in the sandbox, and be collegial as much as reasonable. I think this is really helpful to avoid a difficult interaction with other people, let's understand the responsibility as the first author. Many times you'll, you might assist on a paper but around your research you might also try to take on and be first author for a paper.

And in general, the responsibility of the first author is constructing a tertiary manuscript. So you're authoring the great majority or all of the manuscript, and you should edit it so it's high quality and doesn't have spelling syntax errors, et cetera. You'll do the manuscript submission, you'd collect authorship permissions. And there's just no other way to say this. And I think it's important to say, you just can't turn in a bad paper, a half written paper to the rest of the authors to improve, it's just not a cool thing. And even if they're being nice and don't say anything, they're not going to ... it's just a bad situation.

So before you as a first author, you should finish a paper that you think is in your mind the best you could finish it, the best it could be. And then you can send it on to others for input. It's not, it's definitely very reasonable to meet periodically with your mentor to say, this is the direction I'm going, this is my outline. This is how I think I'm going to work through it. But you shouldn't have them be

correcting punctuation, capitalization and complete sentences syntax. It's just not cool. I think that's just a very important thing to bring up because it's not those roles aren't always well defined or they're sometimes ambiguous.

Dr. Marinelli:

Yeah, as we've been going along here I think we've slowly been building throughout the whole research process starting with motivation, picking a mentor, picking a topic. And now just talking about this, I think the next natural point is talking about writing the manuscript and whatnot. But I think oftentimes, before you sit down and write the manuscript, it can be helpful to get an idea of what journal, what's the audience I'm trying to target. Can you talk a little bit about how to decide on a journal?

Dr. Matthew Carlson:

Yeah, that's a great point. So just like when you're just like being a good speaker understands the audience, being a good manuscript author also is a parallel as that. You should know your audience your writing to. So in general, you'll want to be thinking about the target journal you're going to be submitting to. So if you're submitting to a high impact factor journal for general internal medicine doctors or frontline providers, you'll write it very differently. There's something called an impact factor. And that helps you look at the general quality of a journal. And it helps you weigh different journals. So it can be daunting, you're just starting off in research and there's like 50 different ENT journals. And there's another a hundred peripherally related ones, like audiology or general plastic surgery, all these radiation oncology, all these ones that are peripherally related to our field also.

And it can just be overwhelming to sort out what a good journal is, et cetera. Obviously, the most easy thing is to talk with your mentor about this. But I think it's helpful to understand what the impact factor is. So the impact factor is a number that's assigned to a journal for any given year. And it's based on the number of recent citations or publications that have, the journals received. And so it's an indirect measure of the relative worth of the journal to the subspecialty or the specialty. So the more impact it's had, the more references it will have. I do think it's worth pointing out that the impact factor, major limitation to the impact factor is that if you're in a small field, naturally, your paper is going to be referenced less even if the data or even if the research is well done.

And so most otolaryngology journals have impact factors of anywhere from 0.5 to three, and very few are outside of that. In contrast, general medicine, impact factor, journals impact factors for a general medicine journals are often four, eight, 10, 20, 30, 50 or higher. And it's just because there's, they are often high quality journals. But there's just more people referencing them because there's more primary care doctors, for example. But it does give you a general rule of thumb to start looking at different journals.

Dr. Marinelli:

Another topic that I think is really relevant to our specialty related to this is just, first right of refusal when you submit a conference abstract. That typically comes up with COSM or Academy. Can you just touched on that?

Dr. Matthew Carlson:

Yeah, it's interesting, it's different between different fields. So, I'll publish some articles in the neurosurgical literature and they basically very uncommonly will do this. They'll, so if you submit an abstract to a meeting conference, there's often an affiliated journal with that conference or that

associated society. And then you have an obligation to submit your manuscript to that associated journal. And so in essence in otolaryngology, almost all major meetings have a journal manuscript submission obligation requirement. So for example, if you're submitting an abstract an oral presentation to COSM you're going to have to submit to the affiliate a journal.

So if it's ANS or AOS you'll have to submit to otology and neurotology. Or if it's triological you'll submit to the laryngoscope for example. The same thing holds true for the Academy. So if you submit a manual or an oral abstract to the Academy meeting, that's usually takes place in the fall. You'll often have to submit an associated manuscript for that oral abstract, a little bit before the meeting. And so that's just one thing to consider when you're submitting an abstract.

Dr. Marinelli:

Yeah, I think that it can feel a little bit binding at first, if you feel like you want to submit it somewhere else and it's important to recognize from the get go. Another topic is just balancing this idea of a high impact journal versus reaching your target audience. Obviously, any NEJM has maybe a highest impact factor in our field, but that's not what maybe all the otologist are reading. So can you touch on that a little bit?

Dr. Matthew Carlson:

Most of the niched topics that we're publishing on, and for me neurotology a lot of the general journals aren't going to really have a great interest to publish because their readership really isn't niched in that same field. If you do have a very high impact publication you're working on it's always as balanced, do you publish in the highest impact factor journal to reach the most, the broadest audience. But potentially at the expense of reaching your target audience or the people that might be most interested in hearing it. So it's just or reading about it. So it just balance. There isn't a good answer. Most people in general will go for high impact factor between the two but they're both considerations.

Dr. Marinelli:

And what about open access journals? I think that's been more commonly, I see that nowadays.

Dr. Matthew Carlson:

Yeah, so open access journals. Open access refers to a situation where there's usually an associated cost. It could be anywhere from \$300 to \$500 to a \$1,000, or even \$2,000, that when you submit a manuscript to the journal that you'll have to pay that obligatory fee. And then there'll be openly available for everybody, nationally and internationally. It helps disseminate the publication data. So in that way, it's good, it's more likely to be referenced because it's freely available. But there's been many times residents, and myself I've been blindsided by this. You'll submit something to a journal, it's usually one that you haven't ... someone that's little bit more obscure, the one that you haven't published a lot and you submit it there. And then it will get accepted. And then you'll get these emails saying, "Okay, pay your fee." Sometimes it's one of those small radio check boxes that you're going through and you're submitting it, you don't even look at it because you're just trying to get through the 50 buttons, you have to press.

But just, I guess, go into it with open eyes understanding that some of these journals have open access fees. There's a increasing trend, the more you publish, the more you'll see this. But most of us, most of staff physicians will get about anywhere from two or three to 50 predatory soliciting journal requests on the overnight. So I'll wake up and we'll come into work, and I'll see like 20 requests for

different publications in different journals I've never heard of before. And then you'll, you can get it published in there, usually without any peer review or anything. But they're often with high open access fees. And so, in general, most people stay clear of publishing any of those journals.

Dr. Marinelli:

All right, and I think once we've established who our target audience is I think the next natural discussion is writing the paper. I think this topic can be pretty daunting for at least early on. Can you help us out with how to think about writing the paper?

Dr. Matthew Carlson:

Yeah, it's interesting. I would say that in most situations, writing the paper is the bottleneck in the project. I mean, there's just been countless times where a good data set has been sitting there for a long time. And that's just the last step. And unfortunately, that is often the case but it shouldn't be. I think if you have a good standard way to approach this systematically and taking each step one step at a time, I think getting a well written paper shouldn't be a daunting task and is very achievable. And we'll go through some of the steps. So broadly when you're writing your paper consider the target audience. We already talked about this, but if you're publishing in a subspecialty journal you don't have to provide all this background information about the topic. You can jump into it because you know your target audience they're going to know a lot about it.

But if it's a general medical journal, you have to provide a lot more context for it. Consider the journal requirements. So most papers should be anywhere between 2500 and 3500 words, you should be able to get most points across in that amount of time. Longer papers are generally not better, most people just don't have that attention span. So if you can concise, make it concise in less than 3000 words now that's ideal. Of course, write in third person, include some figures to break things up. In general, it should be written for blinded review. So you shouldn't say in a previous manuscript our group published blah, or if the blank institution IRB, that stuff. So it should be written for blinded review, although not all journals are blinded. Just as I said earlier, one of the most important things to remember as a resident working through this is trying to publish one or two papers a year and being first author. The second thing that I think is just absolutely critical and is completely missed is the idea that presentation is so, so important. I can't emphasize it enough.

Content is extremely important. But I'll tell you that presentation, at least for getting it through the peer review process is extremely important. And perhaps just as important as content, believe it or not. If the reviewer is going through and they're seeing poor English, they're seeing punctuation errors, they're seeing numbers not adding up, they're going to smell blood. And they're going to think that every single aspect of this publication was not done well. And they're going to tear it apart. And then they're going to reject it. If they go through and it was just effortless to read. They didn't identify any errors, they didn't identify any punctuation or anything, they're not going to start second guessing your statistical methods, they're not going to start second guessing anything else. So I cannot emphasize enough how presentations is just important.

And it's one thing that we should be able to control very well. So we'll talk about it a little bit later. But again, I would say highlighting the most important parts of this talk, that's probably one of the most important parts that you should remember. Nail down the hook. As we talked about earlier, each paper should not have more than one or two primary objectives. Determine what this is from the beginning, so that your outline is structured to support the conclusions or to work around that hook. And again, consider your target audience. When you're preparing your manuscript, if it's a topic I don't know a lot about, particularly when I was starting out, I would read 10 or 15 papers on the subject that

were considered better papers. Just to make sure you're touching on the main points or the main issues yourself. And that will also help you develop your list of variables you're going to study et cetera.

I always say that after you read those papers, it's really important you distance yourself in time, so you don't inadvertently plagiarize. I think none of us are ... we're all have gotten far in our career. None of us intentionally plagiarize. But if you just read a sentence in a manuscript that just sounded great, it could be inadvertently easy to do unintentionally. So create an outline with a logical flow. Each paragraph should only convey one or two ideas. And each paragraph should generally build on the next so there's good flow. Avoid saying the same thing over and over again, or having circular discussions. I see that so frequently in a manuscript that I'm reviewing, particularly from somebody who starting off early on. They'll go through a point, go to another point and go back to the first point. You want to work through these things, have good flow and avoid redundancy as much as possible.

And again, the target length should be 2500 to 3500 words. After you've written enough papers you'll just have a general flow that you go through in your head, a general checklist a format for your title page, your cover letter, et cetera. And it just makes it easier because you can keep using that template and you're not reinventing the wheel all the time. So when we talk about the introduction, the introduction should provide the necessary background. It shouldn't be too lengthy. And in general, I think a perfect introduction usually has about three paragraphs and, of course, you could break it up any way you want. But for me, the first paragraph is the introduction to the subject. The second paragraph is the build up. And then the third paragraph is setting the hook. The subtle sales pitch, why is this important? You're building the reader up to this and then you're telling them why you're addressing a critical knowledge gap or building on something previous.

The materials and methods section, it can be lengthy depending on the type of study. Don't include any of the results in the materials and methods section. It's basically written so that somebody else could reproduce your work or perform your same study based on that information. You can shorten it by referencing other papers if another group has published using same statistical methods, or same methods. You can refer to them. And then of course, you want to include your statistical analysis. In your results, don't explain your findings. You're just reporting your results. And provide structured paragraphs, avoid too much overlap between text and figures and tables. Consider headings if appropriate, if it's long and one of the best things I ever I was fortunate to do is to pair up with a very good statistician that I work with on almost all my projects. She's done such a great job, she understands all the content well and it makes my life so much better from the standpoint of publication. And also just the quality level, it's just up another bar.

For the discussion, don't make it longer than two or three pages. Usually, the first paragraph should be a summary of your key findings. The next paragraph I should compare it to what else is in the literature, then discuss future areas of study and discuss strengths and weaknesses at the end. Your conclusion should be one or two paragraphs and it should be brass tacks only. And don't overstate your claims. So after you've done with your conclusions, most people use a program like EndNote to organize and format the references. It's good to be able to do that. I obviously don't want to go through how to do that on this podcast. But I'd encourage you to talk to your mentor or another colleague that's familiar with it. So at that point, you're going to feel like you're done with your paper, but you're not. So what you need to do is you need to set it aside for a while, and then read it again. And set it aside for a while then read it again, then set it aside for a while and read it again.

And put several days in between because what you wrote down at the time made so much sense to you, but then when you came back you would easily see how other people wouldn't be able to follow your logic or your flow. And this just goes back to that main point. One of the main points of this whole talk is presentation is so critical when you're submitting a paper for peer review. You want it to be

written well. A lot of people won't, will have such a hard time writing a paper because they say they just feel like every sentence they write has to be their final sentence, and it has to be perfect. Oftentimes, you just start off by getting ideas down, it doesn't have to be full sentences. Work with an outline, start getting ideas down and start filling it in. And then you start to making it flow better and sound better and moving things around. But it's really common that I'll have 50 versions of a paper as I'm moving through them, which actually brings up another point.

As you're working through it save your different versions as you're going through. There's nothing more frustrating than having some error happened to a document and then saving over it and getting rid of a lot of back data. So I usually, at least every couple days when I'm working on a manuscript I'll re save it with a new name. So you can go back to earlier versions if there's a problem. I'm sorry, if it's a little dry there's just no other way to cover it. But these are key things that I've learned over the years that have helped me a lot. It's just having that process and that process that works well for me.

Dr. Marinelli:

Last topic that I wanted to touch on before we wrap things up for today, is just the review process. Can you talk a little bit about the dynamics of the review process once you've submit the paper?

Dr. Matthew Carlson:

Absolutely. Everyone always thinks that if you ... particularly earlier early on if you get a rejection, you take that, a lot of people take it very, very personally. And I've seen people have it really affect them for a while, they really put their heart and soul into a paper and they get a bad review back. But I want to point out a couple things. The review process is extremely subjective, extremely subjective. It could be that the reviewer got a flat tire earlier in the day when they came in, and they were just in a bad mood. And that's not, I'm not joking that really can happen. It's very, very, very subjective. It depends on the journal but most journals in otolaryngology don't have paid reviewers. It will have editors and people on the editorial team, but the reviewers are generally people out in the field. And they don't have, most of them don't have specific training in how to review a paper well, and they don't use a rigid point sheet.

So if you think you wrote a really good paper and your mentors do too and you get a bad review, honestly, it's easy for me to say because I've published in our papers, but just shrug it off. It doesn't, make it not bother you just take the look at the critique, find out what they said. And if you think it's not right, then ignore it. And if you think there are some valuable points, so you can incorporate those on your paper and then resubmit it. But don't let those things get you down because it's so easy to but it doesn't need to. There's no such thing as an absolutely perfect paper. And if conversely, if your paper is rejected it doesn't mean that it's a bad paper. In reality, probably about 5% of papers are really, really, really good and 20% are really, really bad and everything else is in between.

So if you get a rejection reevaluate it. The review process is a lot more subjective than anyone like to admit. I would say that it's probably true that every single reasonable paper can get published. And this sounds funny, but I think you just have to say it. It's just a matter of how low you're willing to go in your impact factor in your journal. But if you put a lot of time into something, shop it around a little bit to a couple different journals and see what responses you get. There's some general categories for responses that you'll get back from a journal. Accept means that no further revisions are required. To get up straight out acceptance is uncommon, it probably happens in 5% of time or less. Provisional acceptance usually is synonymous with minor review. It means that the editorial team has reviewed it and they think it has significant merit, but they only want you to address some minor points and conditionally accepting it. As probably 20% of time at the beginning.

Major revision is much more common. That means the reviewers found merit in it. But significant merit, but they also feel that there're significant edits or changes that need to be made. And rejection is that they won't consider it even with revision. So those are the different things you can get back. The response time is variable for journals. Typically, after you submit something, you'll hear back in anywhere between one and three months. Don't contact the journal earlier than that. It's usually, early on I read a lot into it, I said, "Oh, it's so bad. They're still reviewing, it's taking them three months. They just don't want to drop the bomb on me that this is going to get rejected." The length of time it's gone has usually has absolutely nothing to do with the quality of your paper, the likelihood it's going to get accepted or rejected. It has to do with the fact that they're having a hard time getting the reviewers to turn in their submissions.

The reviewers are busy clinicians, often, they're just not getting a minute. It's very rarely because they're having an additional review, because I thought it was bad or something like that. So if you get a request for revision, it's a safe way of accepting your paper provided that you're able to address most of the points that are brought up by the reviewers. I want to make the point that you don't have to answer all of the reviewers requests or given to all the requests. Sometimes it's not common, but sometimes the reviewers will actually try to steer your paper. They believe it should say something else that you don't intended to say or don't think it should say, based on their biases. And don't let that happen. You can simply say something very politely to say, respectfully if provided the editor and reviewer agree, I would really like to keep this main point or present it this way.

And usually they'll allow you to do that. So in general, you want to answer, address most of them or give them the most time if you can. But you should stand your ground if that's being steered or put into a direction you think it should go. When you're constructing your response to review document, just as before, have a template system use this, develop a system that works well for you. So you're not recreating the cover letter every single time and not recreating your document every single time. But as a general rule for when you response to review, you want to provide point by point responses, be respectful, refer to page numbers and line numbers, track changes in the revised manuscript. And remember, remember, remember, it is all about presentation. It's critical. So what do you do if your paper gets rejected? Review the responses and have an honest appraisal of the manuscript, why they get it rejected?

If you think it's really good, incorporate those constructive recommendations and resubmit to a similar level journal. If you think it's really not that great, honestly, you can incorporate those constructive recommendations and then you might submit to a lower impact factor journal. But again, I guess if there was a third main point from this in this talk, I would say this, the review process is extremely subjective. And rejection doesn't mean it's a bad paper in any reasonable manuscript can it get accepted? Maybe not in the highest tier journal, but can get accepted.

Dr. Marinelli:

Awesome. Well, I think that we're to about wraps things up for today's discussion. Was there anything else you wanted to add Dr. Carlson before we close?

Dr. Matthew Carlson:

No, I just ... I'm grateful for the chance to present this. I think it's a really difficult topic to present because so many people have different styles of doing research. And so many people might present things differently. And so it's really nuanced. These are things that I've again, either happened upon and worked well for me or things I've learned the hard way from going through it. But again, it's worked for

me. I would say the most rewarding part of my career is taking care of patients and providing good outcomes for our patients.

But on a broader level, there's a great amount of satisfaction that I get when I feel like I've published a paper that's resulted in a change in care at our center, or in my own practice, or more globally in the rest of the specialties. And there's no other way that you really can do that except through research and publication. And so I'd encourage you to stay involved, even if it's something that doesn't come directly natural to you. It's a necessary evil for academic promotion, but it's also something rewarding for you down the road if you stick with it.

Dr. Marinelli:

Well, awesome. I really appreciate your time and coming on this podcast today.

Dr. Matthew Carlson:

Thanks for having me.

Dr. Marinelli:

All right. Well, I'll just wrap things up today by just providing a brief summary of what we talked about. We talked a little bit about establishing good motivation for why you do research ultimately, that's to improve the care of patients. But also recognizing that it's a critical component to academic medicine and progressing in your career. And fundamental to that, especially as a trainee is identifying a good mentor early on. Someone who's productive, someone who's working a lot, maybe early to mid in their career. And then working together as a team, finding good researchers at your institution, and then maybe teaming up with a couple residents that are similarly minded. And saying, "Why don't we all work together, divide and conquer and we all benefit in the process." And talked about how to decide on a research topic, the scope of things, what type of study design.

Knowing that oftentimes, it's a trade-off between scientific merit. And feasibility is something especially important to consider during a finite period of residency when you're only given so much time to do research and you're quite busy in the time that you're not doing research. We talked a little bit about good research etiquette and the importance that as a primary author, you really are steering the ship. The onus is on you to present a very good final product to the senior author and your co-authors when once you're done writing it, and it needs to be an ownership that is established from the beginning. We talked a little bit about how to target different journals impact factor. And then, of course, spending the last bit here on writing the paper and the review process. We hope you find this episode helpful. Don't forget to check out our website at headmirror.com where all of our podcasts are keyword searchable in the content along with our entire surgical video atlas is organized by subspecialty. Thanks for tuning in and we'll catch you next time.