Part I: Overview of Specialty

Description of specialty and patients
Neurology is, for many, the most interesting and most intellectual field in Medicine. It covers neurologic problems from cortical and behavioral illnesses to peripheral nerve and muscle dysfunction. Neurology is a field in which both an extremely detailed history and a careful physical, neurologic examination are essential to diagnose and manage complicated and interesting problems. Thus, it is very time-intensive with regard to the patient’s evaluation, but it is hard to think of another field in which one gets to know patients so well, both in terms of their personalities and cognition on the one hand and the complex and fascinating biology on the other. Also, as opposed to decades ago, when Neurology was known as the field of “diagnose and adios,” therapeutic options in Neurology are numerous and increasing rapidly, whether with scores of new medications, inserted stimulators, or other interventions, including performing EMG/NCS, EEG, botox injections, or neuro-IR procedures.

Career trajectories
Neurology is probably the most academic of all fields in Medicine, with up to half of all neurologists involved, at least part time, in academics and teaching. Fascinating neurologic problems, requiring in-depth evaluation and expertise to help patients, are also found in private practice. Most private practices now, at least in more prosperous regions, are groups of 8-12 or even more neurologists. Even in private practice settings, most groups want subspecialty training for each of their members.

Practice models
A large percentage of neurologists are in academic, hospital-affiliated group practices. There are also large and moderate-sized groups in private practice, and others owned and managed by hospital organizations, HMOs (e.g., Kaiser) or governmental organizations (e.g. the Veterans Administration and Public Health services). One or two person private groups are increasingly difficult to sustain, given the rapidly growing administrative, paperwork burden, including expanding medical malpractice insurance requirements and constraints.

Residency
Neurology residency lasts 4 years, including a first year based primarily (at least 8 months) in Internal Medicine. Increasingly, more and more programs are “categorical,” i.e., the internship year and the 3
years of Neurology residency are included in the same program. Many programs (including both HMS adult Neurology programs) remain "Advanced," meaning the 3 years of Neurology residency are separated from the first year of Internal Medicine, both in terms of what department one works in, and for applications. For these programs, one must apply separately to Neurology residency programs and to Internal Medicine preliminary year internship programs in the same application season.

The first year is identical (or almost identical) to the first year of an Internal Medicine residency. The 3 years of Neurology residency itself are usually primarily on inpatient Neurology ward and consultation services; this will total about 18 of the 36 months of residency. All adult Neurology residencies are required to include 3 months of Pediatric Neurology and 1 month of Psychiatry, with activities directed by those departments, and also several months of elective time for subspecialty rotations, projects (educational or other), or research. All residencies include outpatient continuity clinics, at least once a week, lasting over the 3 years of residency, and there are many shorter outpatient clinic rotations in subspecialties.

Pediatric Neurology is a separate field, almost always including 2 years of general Pediatrics residency before 3 years of Child Neurology residency, i.e., a total of 5 years after med school.

**Fellowships**

Almost all Neurology residents, especially at major academic centers, do 1 or 2 years of subspecialty fellowships following residency. Fields include: Stroke and Vascular Disease, Clinical Neurophysiology [which includes EEG and EMG, usually with activity skewed toward one or the other; in the same area, there are also fellowships in Neuromuscular Disorders or Epilepsy, closely linked to EMG or EEG, respectively], Movement Disorders, Multiple Sclerosis, Cognitive and Behavioral Neurology, Neuro-oncology, Neuro Intensive Care, and smaller fellowships (not always available in all places) such as Neuro-Infectious Disease, Neuro-genetics, Neuroendocrinology, Headache, Sleep Neurology, and Autonomic Dysfunction. There is a growing need for generalists, i.e., those who practice General Neurology, including hospitalist neurologists in some centers, but even those neurologists have usually completed some subspecialty fellowship. Neuro-interventional radiology is a possible subspecialty that neurologists may pursue (even though this is uncommon relative to IR-trained physicians and few programs for neurologists exist). Pain Medicine is another fellowship-trained specialty that neurologists may pursue.

Almost all major academic medical centers have more positions for first year fellows than they have graduating residents. Outside of these centers, many residency graduates do not pursue fellowship training, so competition for Neurology fellowships is not particularly stiff. Most graduates of selective residency programs get the fellowships they want -- unless, for example, they are seeking positions in a particular center with a limited number of positions for a specific fellowship.
Part II: Life as a Neurologist

Demographics
Men and women are about equally represented in Neurology residency now, although there are more men in senior positions, as in other fields; this is changing. Recruiting of underrepresented minority members continues to be a problem, also as in other fields.

Money
Neurology is not a lucrative specialty. Salaries are generally similar to those in Family Practice, Psychiatry, and general Pediatrics. Different surveys report a neurologist’s average salary as anywhere from $170k to 250k (still, worth noting, a few times the income of the average US citizen). Salaries are higher in private practice than in academics, and substantially higher outside of the Northeast. This is true for subspecialists as well as for generalists. Private practice neurologists reach the average and peak salaries faster than occurs in academics. On the other hand, while salaries are not stupendous, the opportunity to get to know patients very thoroughly, to help people with life-, personality-, and independence-threatening illnesses, and to learn about fascinating biology and physiology are superior, and the intellectual rewards are incomparable!

Lifestyle
Most neurologists work from 50 to 70 hours a week; some work part-time. Overnight and weekend call depends on the number of people who share the duties. This could be as frequent as every third night and weekend in a small practice or as infrequent as a few weeks per year in a large academic practice. The difficulty of overnight call varies substantially depending on the specialty. Stroke neurologists will be called frequently for the administration of tPA for acute strokes, but there are relatively few emergencies covered by Movement disorder specialists. Perhaps surprisingly, hospitalists and Neuro ICU neurologists have the most regular hours. Many private practices and some academic groups have Physician Assistants and Nurse Practitioners helping with the practice.

Academics
As noted above, Neurology is among the most academic fields in Medicine. Subspecialty fields include: Stroke and Vascular Disease, Clinical Neurophysiology (which includes Epilepsy and EEG, as well as Neuromuscular illnesses and EMG), Movement Disorders, Cognitive and Behavioral Neurology, Neuro-oncology, Neuro Intensive Care, and smaller fields such as Neuroendocrinology, Sleep Neurology, and Autonomic Dysfunction. Neurologists in academic centers are expected to produce scholarship, but the areas for doing this are many, including basic neuroscience research, clinical studies, and increasingly, education.
Part III: Applying in Neurology

Competitiveness
About 2% of all US medical students enter Neurology residencies. In 2017 there were 492 positions for beginning residency in Neurology; about half were filled by graduating MDs from US medical schools, the rest mostly by DOs and international medical graduates.

Planning later HMS years
At HMS, essentially all clerkship and residency directors are available for advice and counseling, both on how to apply for residencies and for using the remaining time in medical school well.

Clinical rotations, sub-internships
At HMS, a Medicine sub-internship is required for students going into Neurology. These are almost always completed at a hospital other than the hospital where a student completed the PCE year. Relatively few HMS students do sub-internships in Neurology; these and other advanced electives in Neurology are easy to arrange.

Away electives
These can be very educational for your own perspective, but as in other fields, they are generally not very helpful in the application process - unless you have your heart set on one particular program for an "audition," AND you are committed to working particularly vigorously and with a superb background knowledge in the field for a stellar performance.

Recommended electives
The most useful electives before Neurology residency are probably those in medical subspecialties, such as Cardiology and Infectious Diseases, as most Neurology departments take care of sick and complicated patients, and many of the problems encountered are those found in general medicine.

Research
Research experience is valuable and helpful in applying in Neurology. It need not be in basic, bench, “hard-core science” work or even in Neurology, per se. Future neurologists do research in clinical studies and therapeutic trials, in epidemiology and in the health care systems of developing countries, and many other areas of study. For others, projects might be in Medical Education. Whatever the field, it is better to have a sustained research experience over many months than to have several brief experiences. For MD-PhDs, the research (almost always laboratory-based) is obviously crucial, and the letter of recommendation from the research advisor is important. Again, it is important to do one project intensively and well.

National Meetings
If you have the opportunity to go to or present at a national Neurology meeting, it is good to do so. These meetings are excellent networking opportunities and a way to introduce yourself to program
directors and other faculty (although you may learn more by meeting potential fellow residents). The meeting most commonly attended by educators in Neurology is the annual meeting of the American Academy of Neurology, usually in late April - early May. If you lean toward a subspecialty (which is NOT expected yet) or if you have worked on a project in a specialty area, there are also meetings of subspecialty groups, e.g. in Epilepsy, Movement Disorders, Stroke, etc. For MD PhDs, the most heavily attended meeting is the Society for Neuroscience, but it is a VERY large meeting where it may be hard to meet people. The AAN and other Neurology societies usually offer scholarships for students to attend their meetings (one must apply).

**Part IV: Assessing your Competitiveness**

Neurology is (for incomprehensible reasons, and some financial) not the most competitive field, so most HMS graduates will get interviews at most or all of the Neurology programs they apply to.

1. **Grades and the DSA**
   For most Neurology programs, the most important credential in the application is the grade in the Internal Medicine clerkship (and with some attention to Neurology). The HMS DSAs in Medicine and Neurology will be of interest to programs. The text of clerkship reports in the Dean's Letter will be reviewed carefully (in lieu of grades) to look for unusually strong positive comments, or any mildly negative ones.

2. **USMLE Board Exam Scores**
   It is best to have USMLE step 1 score above 240, but scores below 240 will not prevent interviews at most programs if the rest of the application is good. Some programs have cut-offs for USMLE scores, but not most programs. Step 1 scores alone are often sufficient; 90% or more of applicants submit step 2 scores, as well, but they are not absolutely required (check the program website).

3. **Letters of recommendation:** (see below) are reviewed, but most are excellent, so they generally do not distinguish one candidate from another - unless truly glowing (or not so glowing).

4. **Research and publications:** Most applicants have research experience, but again, intensive experience is more valuable than brief exposures. Publications based on research are valuable evidence of achievement, particularly if the applicant is the first author on a paper. "Submitted" papers and posters are also worth reporting.

5. **Extracurricular activities:** Although they may not “matter” as much for the application, extracurricular activities provide great fodder for interview questions. A recent graduate commented: “In my personal experience, almost every single interviewer picked out one or more extracurricular activities and asked me to discuss them (in an informal, curious manner). “
How many programs should you apply to?
Most HMS students apply to 10 - 12 programs - almost certainly far more than necessary. Still, the match has its flukes, and it is probably unwise to apply to fewer than 7. Your advisor or any clerkship or residency program director can give you reasonable perspective and advice here.

Getting an interview
Attributes considered important by programs are those listed above. Invitations are generally sent out shortly after the Dean’s letters are transmitted (October 1), but they continue to be issued throughout the entire interview season – early November through very early February.

Letters of recommendation
Most programs require 3 letters. If possible, at least one should come from a neurologist you have worked with. Most Neurology programs do not require a departmental letter from your medical school (check the program website). Most non-Neurology letters will come from someone in Internal Medicine or one of its specialties. Letters from other departments such as Psychiatry, Pediatrics, Surgery, or others are also worthwhile, if the writer knows you well -but probably no more than one letter from one of these specialties. A faculty member, with whom you have done research, particularly if a paper has resulted, is also a good choice, as they can comment on your work ethic and research experience. Letters from clerkship directors are acceptable, primarily if you have worked together clinically. For MD-PhDs, one letter should certainly come from the research advisor. [A second research–based letter is not necessary; if one is submitted, it should probably be a 4th letter, with at least 2 from clinical supervisors.] Comments on your abilities to perform as a Neurology resident are valuable.

The best letters are from people who know you well. It is far better to have a letter from a Neurology (or other department) junior faculty member with whom you worked extensively on a clerkship or research project than to have a letter from a famous physician who does not know you. It is reasonable to ask any potential writer, “Do you feel you are in a position to offer me a letter which will be helpful in obtaining a residency?” Most will answer honestly; if a faculty member indicates you might want to ask someone who knows you better, you probably should do so.

It is wise to try to make the process as easy as possible for the letter writer. Give the writers your CV and personal statement as soon as they can be made ready (for more good things to say about you). It is strongly recommended you get an agreement to write the letter at least a month (and preferably 6 to 8 weeks) before it is needed; faculty members may have particularly busy times such as attending on inpatient services, national Neurology society meetings, having grants due (or even being on vacation) - - just when you need a letter, if you wait too long.

It is reasonable to ask a potential letter writer to write the letter long before you need it, while the memory is still fresh (especially now, as clerkships may be completed 2 years before you are applying). You may ask as soon as you identify the faculty member you want as your letter-writer; this may be at the conclusion of a rotation or sub-internship.
Some faculty members write letters at the time they are asked; others may put this off until the deadline. Once a faculty member agrees, remember to contact your letter writer again in May or June of the application year to give the writer adequate time to review your record. Plan to meet with each writer in the summer to review your portfolio and give them time to write the letter. Ask them to submit their letters before August 31. ERAS provides a letter request form you should provide to your letter writers. This form assists them with submission of the letter and includes instructions on how to access and use the ERAS Letter of Recommendation Portal. You should send a reminder around August 20 (remember: summer vacations and other commitments arise). You should consider writing a thank you note once the letter is on file with ERAS.

ERAS gives you the option to waive your right to review the letter. There is no benefit to reviewing your letters, and program directors might be concerned if an applicant did not waive this. It is probably best to waive the review.

**Interviewing**

Remember, the interview is not the time when program directors and interviewers seek to learn about your accomplishments, or test scores, or grades. Those are already in your application. They are interested in your career plans (often especially academic ones) and particularly whether you will fit into their residencies and work well with the patients, faculty, and fellow residents. Admittedly, this is very difficult to discern from the interview.

Be prepared to discuss everything in your ERAS application, especially anything in your personal statement. It is natural for interviewers to use this as a start in getting to know you. Be prepared to talk about your accomplishments (when pertinent), and any current projects, publications, or activities outside of medicine. If you have done some research (or any other activity), be sure to know it well enough to answer questions; if you cannot explain well the research you’ve done, it is wise to leave it out of the application. During an individual interview, expect you may be speaking most of the time.

**Common interview questions**

Many interviewers will simply try to get to know you as person and physician (one they would enjoy working with, and who will work well with others): background, career interests and goals, outside interests, etc. Some will stick to a script and ask planned questions; some of those follow.

-Career plans:
  - Where do you see yourself in 5,10,15 years?
  - Might you become a leader in the field?
  - Do you plan to sub-specialize? If so, in which field?

  *Almost all Neurology residents do subspecialty fellowships after residency, but it is perfectly fine to not know yet which one you will prefer in 3 years.*

  - What interests you about this particular program?
  - What do you like about it, and what you might change [careful here: your answer should indicate you are familiar with the program, but this is not the time to reform it completely].
Some interviewers may ask you to describe a problem in your education, a challenge you faced, or a conflict you handled, how you dealt with it, and what the outcome was; or about some constructive criticism you received; or about a challenging patient -- why was this challenging, and how did you handle it? Give an example. This type of question is intended to discern a candidate’s compatibility/personality, for the program. It is a good idea to have an example in mind.

Many neurologists like to ask about interesting or complicated Neurology cases - another good topic to have in mind. If you discuss one, be sure you know the case well. Similarly, if you have done some research, be sure to know it well enough to answer questions (as above) -- or don’t list it. A practice session with your research advisor can help. Writing out answers to some of these questions and rehearsing them is not a waste of time. Similarly, if you write about some unusual experience (or personal or family illness) it is fair for the interviewer to ask you about it.

Common interview errors include
● Poor preparation (e.g. not being familiar with the program - or your own work)
● Inconsistent or vague answers to questions
● Apparent arrogance or condescension
● Disinterest or flat affect
● Inappropriate behavior or humor
● Negative comments about other programs, candidates, or the program itself.

Communication with Programs: NRMP Code of Conduct for Applicants and Programs
Both candidates and programs are governed in their behavior and communication by the NRMP Code of Conduct (available on the NRMP website). This is a contract you agree to by your participation in the Match. The intent of this Code is to protect applicants’ privacy and confidentiality; to prevent programs from asking illegal or coercive questions; and to prevent onerous displays of intent (second interviews or visits, rotations at the program institution, demanding to know how the candidate will rank a program etc.). [“Second looks” should not be requested by the program, but they are usually possible if you wish -- for your information and perspective. While they may show interest in the program, and most programs will be happy to give more information, such visits are very unlikely to change one’s position on a match rank list.]

If you have one clear first choice program, discuss with your advisor whether you should communicate this to the program director. Most programs do not make their Match rank lists based on these comments, despite rumors you may have heard. In most cases it will not help you. Do not tell a program you are ranking them first if in fact you are not planning to do so. Word gets around; program directors talk to one another and to clerkship directors to gather information about candidates, and you do not want a reputation for dishonesty.
**Advocating for Interviews**  
Some programs have waiting lists. Many do not, although they do invite some candidates later in the season as spots open up. If you have not received an invitation to interview by December 1, it is reasonable (after discussing with your advisor) to send a letter to the program director expressing your interest and availability, but repeated emails (more than 1) are likely to be perceived as pestering; one is perfectly fine. Similarly, having a faculty member or advisor request an interview is usually not helpful and can be perceived as interference in the process (and backfire), but a single such letter, tactfully phrased, is acceptable (one at most).

**Rank lists**  
For your ranking of programs in the NRMP match, you should list them in the true order you prefer, not according to which might be the most selective (you’ll have to live with the result). In the same vein, do not list a program if you decide matching there would be worse than not matching at all (you’ve signed a match contract you are obliged to attend the assigned program. If you do not, no other program is allowed to offer you a spot until the following year).