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The NEW ENGLAND JOURNAL of MEDICINE

November 13, 2025

Dear Physician:

As a resident nearing completion of your training, I'm sure that finding the right employment opportunity is a top priority for you. The *New England Journal of Medicine* (NEJM) is the leading source of information about job openings, especially practice opportunities, in the United States. To assist you with this important search, a complimentary reprint of the classified advertising section of the November 13, 2025, issue is enclosed.

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On behalf of the entire *New England Journal of Medicine* staff, please accept my wishes for a rewarding career.

Sincerely,

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How to Launch and Manage a Successful Physician Job Search

Start sooner to keep your sanity, and organize the process

By Bonnie Darves, *a freelance health care writer*

For physician residents and fellows, starting the job search is likely to produce one or more of a wide range of feelings: total excitement, high anxiety, immense relief, fear, and maybe even disbelief that a goal that once loomed incredibly distant will actually come to fruition. That's understandable, and it's to be expected. It's been a long haul, with a lot of heavy lifting along the way.

Physicians who find that initial flurry of emotions edging toward the negative should recognize that the search process, though daunting, is doable. Jobs are plentiful in most specialties. Most physicians who approach the task in a thoughtful, diligent, and organized manner will land, if not the job of their dreams, at least a good opportunity.

One of the most important aspects of launching a successful job search is the timeline itself. If there's one piece of advice about when to get started that holds up historically, it's this: The sooner you start, the better off you'll be.

That's true for both psychological and practical reasons. Procrastination can trigger anxiety, which is counterproductive to the task at hand. Waiting too long might also result in a smaller pool of potential opportunities, especially for physicians in either highly competitive or high-demand specialties.

Tara Osseck, regional vice president for recruiting at Jackson Physician Search, based in Alpharetta, Georgia, observed that in high-demand specialties such as family medicine with obstetrics, ENT, neurology, and urology, hiring commitments might be made well in advance, sometimes two to three years out. "For physicians in these fields, starting early not only increases access to top opportunities but also enables them to align their training, electives, or research interests with the specific role they'll be stepping into," said Ms. Osseck, who works from the firm's Midwest Division in St. Louis, Missouri.

Physicians in low-demand specialties such as neurosurgery, sleep medicine, or family medicine with a sports medicine focus also might need extra time for their search, according to Patrice Streicher, director of operations for VISTA's permanent search division. "They will need to start early, at least 15 months out from the target job start date, to ensure they're competitive — especially if they only want a particular location or geographic region," Ms. Streicher said.

When to start the search

There's no hard and fast rule about when to launch the job search in earnest. However, the consensus among experts — recruiters who've helped scores of physicians find a job and physicians who've navigated the process successfully — is that 12 to 18 months before the end of training is the ideal window.

That might seem like a long time, but it isn't, according to Ms. Streicher. "There are a lot of moving parts to a physician job search, and all of them take time. You need time to prepare, time to interview, time to assess and finalize a contract, and time to get through licensure," Ms. Streicher said.

In her presentations to residents, Ms. Streicher sometimes encounters physicians who are mere months out from completing their training and just getting started. "That's not ideal," she said, because even if those physicians land a position relatively quickly, factors such as licensure and credentialing delays might delay the start date. "It also adds a lot of stress when your colleagues are well into their search."

Ms. Osseck adds a reason for opting for the 12- to 18-month timeline: to enable physicians to get a big-picture view of the marketplace. "That timeline allows for thoughtful exploration of the market, time to evaluate what 'fit' really means both professionally and personally," Ms. Osseck said, and the flexibility to consider multiple options without pressure.

Farzana Hoque, MD, co-director of the medicine acting internship program at Saint Louis University School of Medicine and a longtime physician mentor, stresses the importance of backing up the process when special requirements or considerations are an issue. These might include the following:

- When targeting a highly competitive region or institution.
- When an international medical graduate (IMG) trainee will require a visa, such as a J-1 waiver or H1-B sponsorship, which might narrow job options and affect timelines.
- When pursuing a practice niche or a hybrid role.
- When the physician must accommodate personal or family considerations — a dual-career household, school-aged children, or necessary proximity to a specific geographical location.

Leah Grant, president of the physician solutions division at AMN Healthcare, echoes Dr. Hoque's counsel about niche-practice searches. "If you're an orthopedic surgeon and you know that you want to do only total joints, start the search early — at least 18 months out," Ms. Grant said. Ms. Grant added that today it's not uncommon for physicians with well-defined practice or personal priorities to start their search as early as two years out. "That would have been unheard of five years ago, but we're seeing this now," she said.

Another potential benefit of an early start, several sources noted, might be access to financial stipends during training and, possibly, a better sign-on bonus or relocation package.

How to plan and prepare for the search: documents and priorities key

It might sound trite, or obvious, to say that physicians should have their documents and references ready and their priorities straight before they contemplate posting their CVs on job boards or reaching out to recruiters. But many don't, several sources noted, based on their experience. "Don't

do anything before you have your CV ready to disseminate," Ms. Streicher said, and polished. Dr. Hoque recommends asking a trusted mentor or advisor to review the CV for completeness and tone.

To avoid becoming overwhelmed early on, break down the job search into defined tasks and phases. The phases, roughly, are as follows:

- Self-assessment and preparation: 12 to 18 months out from job start
- Marketplace exploration: 9 to 12 months out
- Offer evaluation and contract execution: 6 months out

This article focuses on the first two phases, before physicians start evaluating offers and reviewing employment contracts.

Once the CV and references are in hand, physicians should tackle their priorities. This can be challenging if some priorities are in conflict. A desired location might conflict with supply-and-demand realities, for example. A desire for work-life balance and a flexible schedule might conflict with the hope of earning top compensation.

The priorities list should address the following issues in a nuanced, not general, fashion:

- **What are your "must-haves"? Which ones might you cross off your list if they're not feasible?** "No job will match 100% of your expectations, so clarify preferences you would be willing to overlook," Dr. Hoque advised.
- **Where do you want to practice? Are there any locations you would not consider?** "Don't go into the market saying, 'I'm open to everything' — you might not find the opportunity you want if you're too broad," Ms. Grant cautioned.
- **What does the ideal role look like, professionally and personally?** Be specific about components that are particularly important. These might be outpatient only practice, potential for teaching, a reasonable call schedule, or the opportunity to do procedures if you're in primary care.
- **What practice setting do you want? What size and type of organization do you hope to join?** The range of possibilities outside of academic practice is broad, from small clinics to mid-sized multispecialty practices to mega-systems. Explore the marketplace in geographical areas you're considering, Ms. Osseck said, "to understand where your interests might align with emerging opportunities."

- **What kind of schedule would you prefer?** If there are family or personal needs that might affect your ability to work specific schedules, note those.
- **What are your key financial needs, beyond market compensation?** Are there perks, such as training stipends, loan repayment, or ample relocation benefits, that might be important starting out?

In this early phase, a preliminary market exploration, from the standpoints of both compensation and marketplace dynamics, is a must. It's also important to gain a grasp of the different compensation models, Ms. Streicher said, because that's not something physicians generally learn during residency. Salary-based models are straightforward, but productivity-based, capitation-based, and value-based models are more complex. Knowing how these models work will be key later when physicians compare practice opportunities.

When the priorities are clear, physicians should update their profile on LinkedIn and professional sites to indicate they're looking for a job. A brief summary should reflect key priorities but not include financial or desired-compensation specifics.

Be intentional and specific about what you're seeking

The best approach is to be very intentional from the start, several sources stressed. "Understand your goals, know the dynamics of your specialty and geography, and treat your search as a strategic investment in your future," Ms. Osseck said.

For Tejas Sangoi, MD, a hospitalist who trained in Saint Louis and finished residency in 2022, clear intentions drove his first job search. He knew exactly what he was looking for in part because he planned to stay in Saint Louis. "I prioritized a high-acuity, busy practice that included teaching opportunities six months into the role," said Dr. Sangoi, whose mentor, Dr. Hoque, helped him refine the scope. For his second job, as a hospitalist at Mills-Peninsula Medical Center in Burlingame, California, location and scheduling flexibility were top priorities.

Family medicine physician Timothy Abels, MD, who went into medicine after a decade in nursing, knew exactly what he wanted but was open to the where. "I wanted to be in a small town where I could get to know the community and feel like a partner. I wanted to be the family doctor with little, round glasses," Dr. Abels said. "But I also wanted a setting that was fully staffed and had low turnover."

For Dr. Abels, that ideal job surfaced in Rock Valley, Iowa, with Hegg Health Center, where he will practice when he completes residency this summer at the University of Arkansas. The opportunity, which he landed through Jackson Physician Search, ticked all the boxes when he made his site visit.

Be strategic in sending out CVs

Posting the CV too broadly, too quickly, can undermine even the most intentional job search. It might be tempting to post the CV on a half-dozen job boards to see what's out there, but that's a surefire recipe for inundation, all sources concurred. Start with the professional society job board, and expand the reach slowly and carefully as needed to avoid a barrage of emails and texts. Alternatively, choose a highly experienced recruiter who does a lot of work in the specialty.

"I've seen doctors post their CV on job boards and pull themselves off an hour later because they get overwhelmed with responses," Ms. Streicher said. That's what happened to Dr. Abels. Within hours, he received more than 200 calls and scores of emails. "It was pandemonium, and I was working nights at the time," he said.

Orthopedic trauma surgeon Lisa Cannada, MD, director of faculty integration for the UNC School of Medicine in Charlotte, advises specialists to rely initially on their professional organization's job site to get a sense of the range of opportunities. "Trauma surgeons only know residency practice, but in fact, more than 70 percent of potential jobs will not be in academic medicine," said Dr. Cannada, who is with Novant Health. She helped launch the Orthopedic Trauma Association's Young Practitioners Forum several years ago to support residents and fellows preparing to start their careers.

The best way to manage the influx of communication that occurs once the CV is out in the world is to create a funnel of sorts by getting a second cell phone and setting up a dedicated email inbox. Dr. Hoque advises using something similar to the following email alias structure:

The following are other tips for organizing and managing search communications:

- On job boards, only opt in to relevant regions, roles, and practice types, and quickly unsubscribe from mass email blasts or overly broad postings, Dr. Hoque advised. Use phone settings or apps to mute unknown numbers or filter spam, she added.
- When revealing the preferred job type and location(s), be as specific as possible. Ms. Grant recommends creating a template for recurring communications that clearly lists priorities. "Clearly state what you're looking for, and where. If you want to practice hospital medicine within 50 miles of San Francisco, put that in your template," Ms. Grant said.
- Once the priorities and wish list are clearly indicated, only reply to messages for jobs that you're truly interested in. "It really is OK to just hit delete," Ms. Streicher said.
- Organize the message flow with a spreadsheet or other system. Note messages that you've responded to and those that warrant follow-up. Set aside at least 30 minutes a week to review messages and update search activities, Dr. Hoque advised.

Several sources mentioned the value of keeping the advice inflow to a minimum at this stage. Stick to a few key individuals whose credentials, experience, and values you appreciate, and graciously tune out the people who mean well but don't have advice you need — or want.

Dig deep and network when exploring the job market

Once physicians have identified a brief list of potential practice opportunities, it's time to start in-depth discussions. Ideally, this phase will start about nine months out from residency completion, with phone discussions with either recruiters or individuals who have encouraged the physician to apply.

Phone discussions should be heavily leveraged for specific job details before moving to virtual and onsite interviews. Ms. Osseck advises using these conversations as a two-way assessment, in which potential candidates ask targeted questions that get to the heart of culture, practice expectations, and long-term growth potential. Compensation is important, but it shouldn't inordinately drive the discussion at this phase, assuming that opportunities under consideration are in the right ballpark financially.

"Partnering with a knowledgeable recruiter can streamline this phase and ensure that you're seeing the right opportunities, not just the most visible ones," Ms. Osseck said.

Networking is key throughout the search process, and attendance at specialty meetings (ideally, two a year) is an effective way to network strategically. The idea is to frame networking outreach as "a curiosity-driven conversation," advised Dr. Hoque, not a request for job leads. Besides reaching

out to alumni and, physicians might also contact conference speakers or physicians who work at hospitals or health systems they're interested in. The basic script, in Dr. Hoque's view, should go something like this: "I admire your career path and would like to hear how you chose your current role."

"This approach feels more authentic and less transactional, and it often leads to helpful insights or referrals," Dr. Hoque said. As a reminder, send a timely thank you to anyone who took time to provide counsel.

Do's and Don'ts for the Journey

The individuals who shared their perspectives for this article provided numerous tips for structuring and managing a successful physician job search and for avoiding some of the hassle and stress that go with the turf. Here are a handful of good ones:

Avoid starting too late. "Waiting until the last few months of training, or until burnout sets in, can drastically limit your options and force reactive decisions. Starting nine to 12 months in advance will provide you with adequate time to evaluate opportunities, interview meaningfully, and negotiate from a position of strength," said Ms. Osseck.

Max out conference attendance to the extent feasible in the final year of residency. "It's important to remember that many physicians end up in jobs that were never advertised," said Dr. Cannada, and those opportunities often surface through contacts made during conferences.

Consult with your spouse or significant other before you start your search, and check in frequently along the way. All sources stressed the importance of working jointly to establish job-location criteria and work-schedule logistics to ensure that any opportunity under consideration will meet the family's needs, too. "It's very important to be on the same page. We sometimes speak to physicians who are expecting to relocate who haven't really spoken in depth with a partner," said Ms. Grant.

Be professional and candid when working with recruiters, and avoid those who don't adhere to your requests. "It's important to treat recruiters as partners, not just messengers, and make sure they obtain your approval before sending in your CV. Even if you decline a role, they might contact you later with a perfect fit," said Dr. Hoque. She further advises physicians to avoid any recruiter who pressures them to act quickly, can't provide full job details, or is vague about compensation or contract terms.

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Creating a Physician CV That Shines

Simple format, brevity, and absolute accuracy — and avoiding including extraneous details — are musts.

By Bonnie Darves, *a freelance health care writer*

Physician residents and fellows who start writing their curriculum vitae (CV) usually approach the task expecting that it will be a straightforward matter of letting the world know where they've been and what they've done, in a document that is about three pages in length. In theory, that's about right. In practice, however, many young physicians, especially those about to launch their first job search, quickly find themselves sweating the details. They wrestle with how much detail to include and how to structure their CV as the selling tool they intend it to be: a document that sets them apart from the crowd.

Fretting a bit about getting it right is not a bad thing, say recruiters and physicians who are on the receiving end and who review scores of CVs each year. Too often, young physicians don't take the time to ensure that their CV is not only polished and error-free, but also an accurate reflection of important accomplishments that prospective employers care about.

John D. "Jack" Buckley, MD, vice chair for education in the department of medicine at Indiana University School of Medicine, frequently encounters CVs that leave out the kinds of details that might be differentiators:

committee work, quality-improvement initiative involvement, medical student teaching or mentoring, or even assistance on a hospital IT project.

"Ideally, everything that is on your work calendar should be on your CV, and there should be a brief description and timeline of those roles or assignments," said Dr. Buckley. In his experience, residents usually include their research work but sometimes leave out these kinds of quasi-extracurricular activities, thus missing an opportunity to demonstrate their willingness to go above and beyond what's required of them.

Sapna Kuehl, MD, director of the internal medicine residency at Saint Agnes Healthcare in Baltimore, Maryland, also urges physicians to briefly describe their roles in committee, task force, or initiative work, and associated accomplishments. "People who are hiring physicians out of training are looking for evidence of dedication and persistence," she said.

Format: keep it simple

Choosing a CV format is perhaps the easiest aspect of preparing a professional-looking CV. Examples abound online, and most training programs provide a recommended template for physicians seeking structure guidance. The basic content and suggested order of information appearance, for trainees seeking an initial practice opportunity, are as follows:

- Name and contact information
- Education, undergraduate through internships, residencies, and fellowships — including specific clinical roles and any leadership roles
- Licensure (status of applications planned or underway, if any)
- Board certification or status
- Professional experience (medicine-related only), including procedure and patient volumes, if/as applicable to the specialty, and administrative roles or duties
- Activities and committee memberships, including roles and brief descriptions of associated accomplishments
- Honors, awards, and professional affiliations
- Publications and presentations

All dated entries should be chronologically arranged on the page from present to past, in a month/year format. Physicians should be prepared to explain any gap of more than three months in a conversation or a cover letter, all sources agreed, and should never attempt to "fudge" or cover up a gap. "A gap can be a red flag to a recruiter, even if the reason is completely understandable," said Laura Schofield, a recruiter with Boston-based Atrius Health, which employs approximately 950 physicians.

Christopher Shireman, who is chief executive officer of Western Neurosurgery Ltd., in Tucson, Arizona, and has vetted scores of physician candidates over his 20 years in health care leadership, expects physicians to explain any sizable timeline gaps in an accompanying cover letter, not in the body of the CV. "I had one candidate who had a one-year gap before medical school, who spent that year working in an emergency room. In another case, the candidate took off a year during training to take care of his dying mother," Mr. Shireman said. "Most of the time, it's just a matter of letting people know why there's a gap."

Regarding date and timeline entries, physicians should doublecheck all dates before finalizing the document and ensure that the CV is up to date, according to Jeffery Johns, MD, medical director of the Vanderbilt Stallworth Rehabilitation Hospital in Nashville, Tennessee. "It's important that your CV is up to date as of the day you send it. If you have an entry that reads '2013–present,' for example, ensure that's correct," said Dr. Johns. Failing to address such an important detail reflects poorly on the physician. "When I review CVs, I am looking for meticulous attention to detail."

The CV should be rendered in a simple sans serif font in an easily readable font size — at least 11 or 12 points — and physicians should stick to a single font and size, and a very simple presentation format. "Remember that this is not an art contest," Dr. Buckley said.

Brenda Reed, who is director of physician and medical staff recruitment at Atrius Health, considers a "busy" CV — one with several fonts or font sizes, or documents that contain graphics — not only annoying but also cause for mild suspicion. It can give the impression that the physician is trying too hard. "I have seen a beautiful CV hide a candidate who had serious performance issues or other problems, so I am a bit wary when I see a fancy CV," she said.

In that same vein, Dr. Johns recommends that physicians who are preparing hard copies of their CVs to hand out at conferences or job fairs use a

decent-quality paper stock — something slightly heavier than 20 lb. bond copier paper — but nothing dense, elaborate, or textured.

Keep recipient in mind

Rita Essaian, DM, MHA, executive administrator, human resources, at the Southern California Permanente Medical Group (SCPMG), which employs more than 9,000 physicians, stresses the importance of ensuring that the CV is error-free and professional in appearance. "The CV should be crisp, clean, and clearly written — no grammar or spelling errors — but also succinct," Ms. Essaian said. SCPMG hired between 500 and 900 physicians annually in the past three years, and its recruiters receive more than 4,000 CVs in a given year, she explained. A recent cardiology position posting, for example, attracted 100 CVs. Given such volume, a physician whose CV is illegible, error-ridden, or difficult to follow might not make the first cut.

"Physicians should always have their CVs reviewed and proofread before sending them," Ms. Essaian said. She added that potential candidates reaching out about a particular posted position should also ensure that the CV and cover letter clearly indicate relevance to the position of interest. The recruiters who do the initial screening, she said, will first match CVs to posted opportunities, and also screen on the basis of criteria the department chief provides before forwarding CVs to reviewing physicians.

Dr. Buckley agreed. "Residents and fellows should always have someone they trust review their CV draft," he said. Several sources recommended that trainees whose first language is not English should seek professional help crafting and polishing the document if such services are not readily available through their program.

Physicians should also pay attention to seemingly minor formatting details that, if not handled properly, could frustrate potential readers who review scores of CVs as part of their job. Page numbers and an identifying footer including the physician's name should appear on all pages. Further, ensure that the document's file name isn't cryptic, urges Ms. Reed. "One of my pet peeves is when candidates send a perfectly lovely CV, but then name the file 'myCV.' Always think about how something will be received on the other end," she said, because attachments can and do get separated from the email message. She and other sources gave their votes to file names that start with the physician's last name, followed by first name.

Finally, it's advisable to prepare the CV in PDF format. That's not a guarantee that the CV won't be altered by a recipient — unfortunately, this does happen, recruiters said. Using a PDF is a deterrent, at least, because someone who decides to alter the document for whatever reason would have to first go through the trouble of converting it to another file format.

What to include, or possibly exclude

Regarding information that should not be included in the physician CV, sources interviewed for this article had mixed opinions in some cases. Most sources advised against residents including a career statement or job objective at the top, below contact details. That information is usually more appropriate for a cover letter or accompanying email note, unless its inclusion in the CV is requested.

There might be exceptions, however, depending on the employer. The Permanente medical groups' recruiters and physician reviewers appreciate seeing a brief opening statement in a CV, especially if the physician has been in practice for several years. "In those cases, we really like to see a half-page career summary on the first page," Ms. Essaian said. Another reasonable exception, several sources acknowledged, might be for internal medicine physicians who know that they only want a hospitalist position, not an outpatient practice job.

Regarding whether cover letters or explanatory notes should be supplied with CVs, the general consensus was that doing so is usually helpful and is definitely in the category of "can't hurt." At the very least, the accompanying document provides an opportunity for the physician to state why she or he is interested in either the organization or a posted position.

Dr. Kuehl, who favors a brief personal statement or cover letter, advises that the document should be employer focused. "It shouldn't be too 'I' focused," she said. "It's an opportunity to talk about what you would bring to the organization that might distinguish you from other candidates — such as work in population management, IT expertise, patient counseling skills, or practice improvement experience," she said.

Ms. Essaian noted that her organization also likes to see evidence in the cover letter that the candidate has gone to the effort to learn something about Kaiser Permanente health plan and its medical groups, which are independent entities that care for health plan members.

Sources offered mixed opinions on whether to include test scores. The general consensus was that unless the scores are very high, such as 220 or higher on the USMLE, it's best not to include them.

Some recruiters and physicians favored a final section that lists personal interests and hobbies; others considered such detail extraneous. Ms. Essaian, for instance, said that her organization prefers not to see any personal details. Those who voted for including personal interests stressed the importance of employing brevity — two lines at most — and, of course, using good judgment in choosing what to reveal.

"I appreciate knowing a little bit about physician candidates' interests — if they like hiking or snorkeling or skiing, for example, because that often helps with icebreakers and gives me a sense of who they are," said Ms. Reed.

In the hobbies category, short-and-sweet is a must, according to Janet Jokela, MD, MPH, acting regional dean at the University of Illinois College of Medicine at Urbana. "I counsel residents that they don't need to include their interests. But if they do, it should be a simple, short list, separated by commas, with no explanatory detail," she said. "A resident who once asked me to review his CV draft had included three sentences on his basement home-brewing operation — not advisable."

Mr. Shireman, who has reviewed numerous physician specialists' CVs, appreciates knowing about candidates' personal interests for the same reason Ms. Reed cites. "Especially in an intense field like neurosurgery, I want to see that information — just a line or two — because it shows me they're human and that they have a life outside of medicine," he said.

The issue of whether to include a photo elicited varying responses, but most sources advised against including one — and definitely not embedded in the CV document — unless a photo is requested. "There is always the possibility of unconscious bias, so I think it's best to avoid including one," Dr. Buckley said. Ms. Schofield noted that some training programs encourage their international medical graduates to send photos and that some hospitals seeking candidates may require them, though she herself opposes the idea.

It should go without saying that physicians should never inflate, embellish, or mischaracterize their achievements in an attempt to give a better impression. Besides being dishonest, such tactics are likely to backfire at some point, with potentially career-damaging repercussions. "Honesty and complete accuracy are the most important aspects of a CV. Physicians should never inflate anything," Dr. Jokela said.

Sources agreed that physicians should keep to the standard order of information appearance while attempting to position potentially distinguishing details on the first page, if possible. "Residents and fellows who have received awards or special recognition should consider moving up that information so that it appears on the first page, if it's not too awkward to do so," said Dr. Jokela. At the very least, she added, important awards shouldn't be buried at the bottom of the document.

There appears to be general agreement that the following information generally should not be included on the physician CV, under most circumstances:

Birthdates, Social Security numbers, and any other official identification number. These should be excluded for both security and bias-avoidance reasons.

Marital status. This detail falls under the category of extraneous information, all sources agreed. Besides, if a candidate proceeds to a site interview or even a formal pre-interview call, that detail will likely emerge in the context of a conversation, even though recruiters and individuals involved in hiring are prohibited by law from asking for such information.

References. Including references before they've been requested can give a recipient the wrong impression. And besides, Mr. Shireman points out, references usually won't be checked until a candidate has completed a site interview and the organization is considering setting a second site interview or drafting an offer. "Listing references before they're asked for can make it look like you're trying too hard," he said.

Extensive publication details. Ideally, the publication citations should include only the basic details — the article author(s), title, and journal name and publication date.

Conference attendance. Several sources mentioned that they have occasionally received residents' CVs that list conferences attended. This isn't an important detail, except in cases when the resident gave a presentation or talk at the conference. That information would go under the category of invited speeches/presentations, below publications.

CV length and 'version control'

The ideal length for a physician CV varies depending on the individual and the type of position being sought. In most cases, residents' CVs can and should be rendered in a few pages (three or fewer) unless the trainee happens to have an unusually extensive research or publishing history.

Most sources thought that a single CV version should suffice in most cases, but several noted that there might be situations that warrant creating a short and long version. Physicians seeking a research position, for instance, might create a short version including the basics and a longer version detailing their research interests and accomplishments, and then offer recipients the opportunity to receive the longer one. Likewise, physicians seeking an administrative position or one in which special skills in health care IT are a plus, for example, might craft an additional document or addendum that describes their related experience.

"In most cases, a longer-version CV is really more appropriate for senior faculty members than for young physicians," Dr. Jokela said.

CLINICAL PRACTICE

Hair Loss in Women

Elise A. Olsen, M.D.[1]

This Journal feature begins with a case vignette highlighting a common clinical problem. Evidence supporting various strategies is then presented, followed by a review of formal guidelines, when they exist. The article ends with the author's clinical recommendations.

A 46-year-old premenopausal woman presents with a 3-year history of progressive thinning and shedding of her scalp hair. She has well-controlled hypertension and relates no recent surgery, weight loss, or change in her medications or medical conditions. She has mild hirsutism treated with plucking. On examination, she has a decrease in hair density in the central scalp with frontal accentuation, retention of her anterior hairline, absence of scalp inflammation, and release of multiple hairs on a gentle hair pull. Eyebrows and eyelashes are intact. How would you treat this patient?

Author affiliations are listed at the end of the article. Elise A. Olsen can be contacted at Duke University Medical Center, 40 Medicine Circle, Box 3294, Durham, NC 27710.

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CME

THE CLINICAL PROBLEM

Female-pattern hair loss is the most common cause of hair loss in women.[1] The prevalence of this condition is 3 to 12% among women of European descent in their 20s and 30s, 14 to 28% among those in their 50s, and 56% among those older than 70 years of age.[2,3] The prevalence is lower among Asian women — 12 to 25% among those older than 70 years of age[2] — and is unknown among women of African descent owing to the common overlap of the clinical findings of female-pattern hair loss with those of early central centrifugal cicatricial alopecia. It is unclear whether the decrease in hair density or diameter (or both) commonly seen in older persons, known as senescent or involutional alopecia, is a distinct entity or a part of pattern hair loss (i.e., pattern hair loss that occurs in men or women).

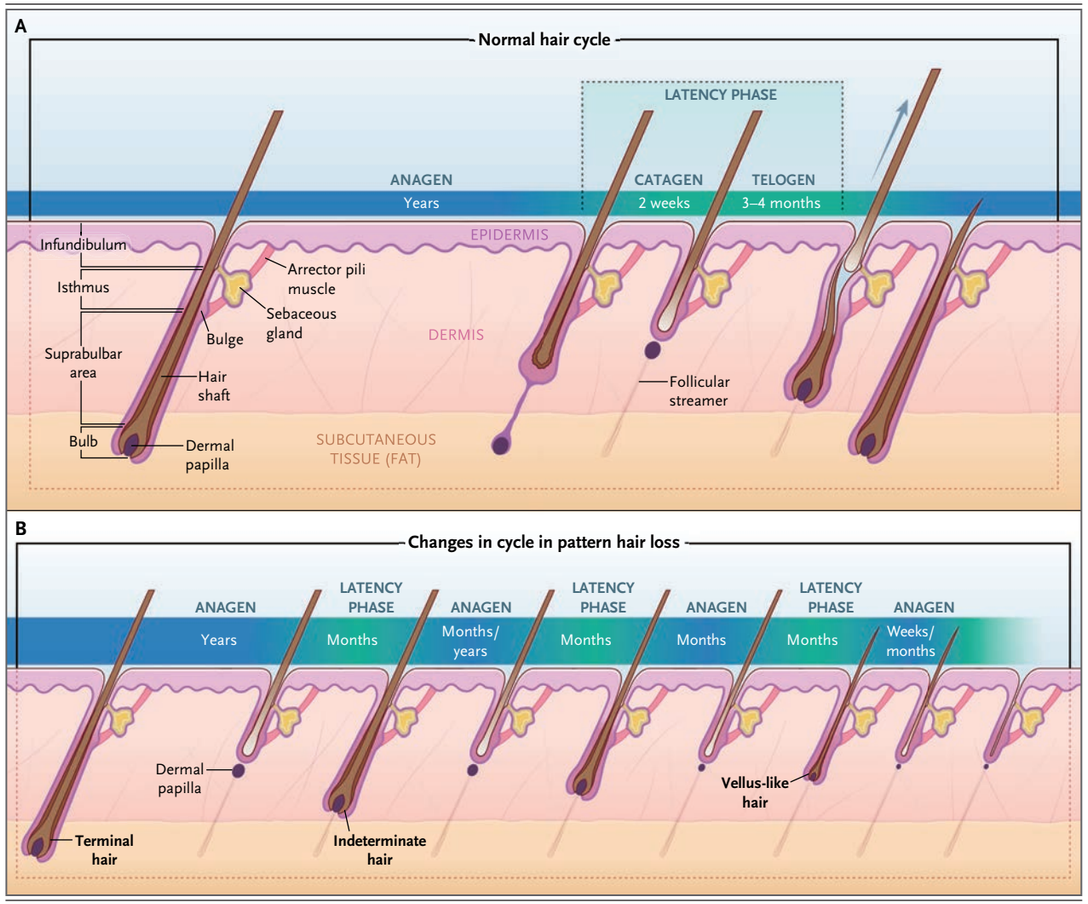
Both male-pattern hair loss and female-pattern hair loss are characterized by progressive miniaturization of the hair follicle, a shortened anagen (growth) phase, and a prolonged latent phase[1] (Fig. 1). Scalp hair is arranged in follicular units of two to four terminal hairs (>60 μm in diameter) and one or two vellus hairs (<30 μm in diameter), with the degree of miniaturization specific to each individual hair. This miniaturization process leads to a progressive, but variable, decrease in the caliber, length, and number of hairs in an affected follicular unit.[1,4] Female-pattern hair loss manifests as decreased hair density in a diffuse central or frontal accentuation pattern but without baldness[1,5] (Fig. 2). The rare manifestation of female-pattern hair loss in women that mimicks that of male-pattern hair loss is usually related to marked hyperandrogenemia and, if accompanied by virilization, should arouse suspicion for a tumor. Female-pattern hair loss may first manifest between puberty and the late 20s (early-onset female-pattern hair loss) or in the late 40s through menopause (late-onset female-pattern hair loss).

Whereas male-pattern hair loss is a genetically determined, androgen-dependent

KEY CLINICAL POINTS

HAIR LOSS IN WOMEN

- Female-pattern hair loss is common and increases with age. Distinguishing between early-onset and late-onset female-pattern hair loss and establishing the presence or absence of hyperandrogenism or hyperandrogenemia may identify subpopulations of patients with varied etiologic factors and response to treatment.
- The major clinical features of female-pattern hair loss are a pattern of central-scalp hair loss with or without frontal accentuation, preservation of follicular ostia, and variation of hair-shaft diameter. A scalp biopsy can confirm the disorder and determine the potential for regrowth.
- One treatment strategy for female-pattern hair loss is to start with either 5% topical minoxidil twice a day or a low dose of oral minoxidil and escalate the latter if no unacceptable side effects occur (e.g., symptomatic low blood pressure, peripheral edema, or hypertrichosis).
- Antiandrogen agents or 5α-reductase inhibitors are effective treatments in women with female-pattern hair loss and are useful in combination with minoxidil.
- For patients with female-pattern hair loss who prefer to avoid medications or wish to augment their medical therapy, microneedling, platelet-rich plasma, nonablative fractional laser treatment, and low-level light therapy may be useful.



process, the causes of female-pattern hair loss appear to be more complex, involving hormonal, genetic, and environmental factors. Follicular androgen sensitivity in both male- and female-pattern hair loss appears to be related to increased expression of the androgen receptor and 5α-reductase in affected scalps.[6,7] 5α-Reductase converts testosterone to the more potent, avidly bound dihydrotestosterone. In genetically sensitive follicles, the binding of androgen to the X-linked androgen receptor, which is strategically located on the dermal papilla of the follicle, leads to reduced proliferation of the dermal papilla cells and the closely aligned matrix cells that form the hair shaft. Signs of hyperandrogenism are common in women with female-pattern hair loss, especially in those with early-onset female-pattern hair loss.[1] Among those with female-pattern hair loss and hirsutism, more than 80% will have hyperandrogenemia,[1] and polycystic ovarian syndrome is not uncommon.[3]

Figure 1 (facing page). The Hair Cycle with Normal Hair Growth and with Pattern Hair Loss.

Panel A shows the hair cycle of a normal-scalp terminal hair. The cycle includes 3-to-6-year periods of active hair growth (anagen) separated by periods of inactivity. This latency phase is initiated by a brief period of apoptosis-driven regression of the inferior portion of the hair follicle and upward movement of the remaining follicle and its dermal papilla to the area immediately below the arrector pili muscle. This brief transition period (catagen) is followed by a quiescent period (telogen) that lasts several months. At the conclusion of telogen, the hair shaft is shed (exogen), anagen is reinitiated, and the anagen follicle moves downward along the collapsed follicular streamer to its former location in the subcutaneous tissue. Panel B shows the hair cycle in pattern hair loss. In male-pattern or female-pattern hair loss, the process of miniaturization of individual hairs in affected follicular units drives the degree and location of the hair loss. The dermal papilla and the bulb of affected hairs, which determine the diameter of the hair shaft, synchronously become smaller and the duration of the anagen phase, which determines the length of the hair shaft, becomes shorter over several cycles. An additional period of quiescence called kenogen follows telogen in pattern hair loss, which lengthens the latency phase between active anagen phases and increases the time that affected follicles and follicular ostia may remain empty of hair shafts. In severe pattern hair loss, this miniaturization process can evolve into actual follicular loss. The net result is a decrease in follicular density and volume.

However, female-pattern hair loss has neither a clear association with any of the various loci identified in male-pattern hair loss nor the strong paternal relation with hair loss seen in male-pattern hair loss.[2,3,8-11] Most women with female-pattern hair loss have no clinical or biochemical evidence of androgen excess, and the response to antiandrogens or 5α-reductase inhibitors among women with this condition is inconsistent. The female-pattern hair loss phenotype has also been reported in the complete androgen insensitivity syndrome and in the absence of androgens.[10] In addition, waning plasma androgen levels are present in women with late-onset female-pattern hair loss.

Aromatase, a key enzyme regulating both estradiol and testosterone levels, is decreased in the affected scalp of those with female-pattern hair loss.[7] This fact suggests not only a potential relationship of estrogen with this condition but another mechanism for increased tissue androgen in women with female-pattern hair loss. A female-pattern hair loss phenotype indistinguishable from naturally occurring female-pattern hair loss develops in women taking antiestrogen agents. Several studies have suggested associations, inconsistently confirmed, between female-pattern hair loss and polymorphisms of the genes *CYP19A1* and *ESR2*, which encode aromatase and the target receptor for estrogen, respectively.[11,12] Because the relation of androgens to the female-pattern hair loss phenotype is complex and androgen-independent factors may also play a role, the term "female-pattern hair loss" has largely supplanted the term "androgenetic alopecia" with respect to women.[3]

STRATEGIES AND EVIDENCE

The pattern of decreased hair density on the central or frontal scalp (or both) and the general sparing of hair on the occiput are key features of female-pattern hair loss. Parietal and bitemporal areas may also be involved. Trichoscopic evaluation shows variation of hair-shaft diameter and preservation of follicular openings (ostia), the latter confirming the presence of intact follicular sebaceous units and a potentially reversible process. Focal atrichia — 2-to-4-mm hairless areas commonly seen in late-onset female-pattern

hair loss — may reflect the prolonged latent period after hair shafts have been shed or the loss of follicles seen on scalp biopsy in advanced pattern hair loss.[13] Clinical inflammation is absent unless the patient has an additional scalp condition.

The differential diagnosis of female-pattern hair loss includes types of reversible as well as cicatricial (scarring) hair loss[3] (Fig. 3). Telogen effluvium, which is characterized by a history of increased shedding of scalp hair and a diffuse decrease in hair density, is associated with a reversible increase in the percentage of hair in the telogen phase. Chronic telogen effluvium may occur in concert with female-pattern hair loss.[14] Frontal fibrosing alopecia, which was first described in 1994, is now the most common type of cicatricial alopecia. It manifests predominantly in postmenopausal White women as recession of the anterior and parietal hairlines, perifollicular erythema, loss of follicular ostia, and loss of eyebrows, each of which may appear independently and in any temporal order.[15] Fibrosing alopecia in a pattern distribution is a type of cicatricial hair loss that appears specifically in areas of the scalp where pattern hair loss occurs. Central centrifugal cicatricial alopecia, seen predominantly in women of African descent, manifests as a progressive decrease in hair density in the central or vertex scalp with loss of follicular ostia and potential balding.[16] Scalp-biopsy specimens from patients with these conditions have characteristic histopathological findings but also commonly show follicular miniaturization suggestive of underlying female-pattern hair loss. Previously published articles have suggested female-pattern hair loss as one etiologic factor in each of these conditions.[17,18]

If a diagnosis of female-pattern hair loss is suspected, a 4-mm scalp biopsy will help to confirm the diagnosis and can provide information on follicular density. Typical histologic findings include a decreased ratio of anagen hair to telogen hair and of terminal hair to vellus hair. A lymphohistiocytic infiltrate at the infundibulum or isthmus (upper part) of the follicle is present in approximately 70% of biopsy specimens,[14] which raises the potential relevance of microinflammation in female-pattern hair loss. A biopsy can also identify any resident microflora in the infundibulum (bacteria, fungus, or demodex), which could be related to the microinflammation and benefit from treatment. Both inflammation and follicular density have been shown to affect response to treatment.[17]

A targeted history that includes age at onset, evolution of the hair loss, menopausal status, signs and symptoms of potential hyperandrogenism (hirsutism, irregular menses, infertility, or cystic acne), current medications or supplements that have androgenic properties, and hair-care practices is key to help determine further evaluation and treatment. Also useful are blood tests to assess androgen levels in persons with signs of hyperandrogenism and assessment of complete blood count, iron and vitamin D levels, and thyroid profile to identify the major potential factors that may affect hair regrowth.

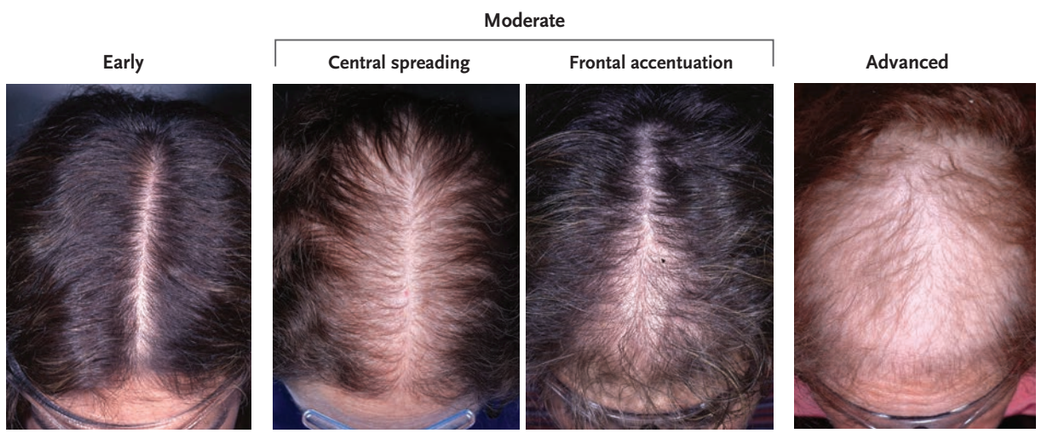


Figure 2. Severity Scale for Female-Pattern Hair Loss.

Patients with female-pattern hair loss may present with minimal evidence of scalp hair loss. A midline part in early female-pattern hair loss usually will show an increase in part width and a decrease in hair density (left panel) that are especially notable when compared with that in the occiput. An increasing part width from the vertex toward the anterior hairline, even if subtle, will help to differentiate the condition from telogen effluvium. As female-pattern hair loss progresses, one of the two primary patterns becomes obvious — a central spreading (Ludwig) pattern (left-middle panel) or a "Christmas tree" or frontal accentuation (Olsen) pattern (right-middle panel). The degree of hair loss may occasionally progress to a marked decrease in density across the entire top of the scalp (right panel), simulating a primary cicatricial alopecia; a scalp biopsy is recommended in these cases.

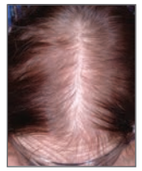
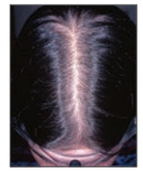
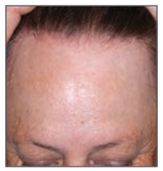
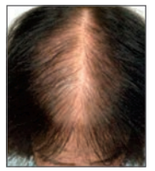
	 Female-Pattern Hair Loss (FPHL)	 Chronic Telogen Effluvium	 Frontal Fibrosing Alopecia	 Fibrosing Alopecia in a Pattern Distribution	 Central Centrifugal Cicatricial Alopecia
Patient Population	After puberty through menopause, all races	Any age or race, more commonly middle-aged women	Typically postmenopausal White women but any age or race	Typically middle-aged or older women but any age or race	Typically women of African descent, any age
Pattern of Loss	Central or frontal accentuation	Global hair loss	Anterior hairline recession with or without bitemporal and parietal hairline recession	Central hair loss	Central- or vertex-spreading hair loss, balding common
Loss of Follicular Ostia	No (unless advanced with depletion of folliculosebaceous units)	No	Yes	Yes	Yes
Perifollicular or Interfollicular Erythema	No	No	Common	Common	Variable
Perifollicular Hyperkeratosis	No	No	Common	Variable	Variable
Additional Key Points	Variation in hair-shaft diameter Spares occiput Scalp biopsy if uncertain of diagnosis or if focal atrichia	Present >6 mo Diffusely positive hair pull for telogen hairs May overlap with FPHL	Possible isolated or concomitant eyebrow loss Prominent facial veins and facial papules in some cases Scalp biopsy diagnostic if clinical diagnosis uncertain	May be present with frontal fibrosing alopecia May mimic FPHL, especially FPHL with follicular depletion Scalp biopsy recommended	Early stage may be difficult to distinguish from FPHL Scalp biopsy recommended

Figure 3. Differential Diagnosis of Female-Pattern Hair Loss.

The conditions listed in the four right columns may warrant a scalp biopsy to distinguish them from female-pattern hair loss. In addition, miniaturization may be present histologically in each of these conditions, which would suggest concomitant female-pattern hair loss.

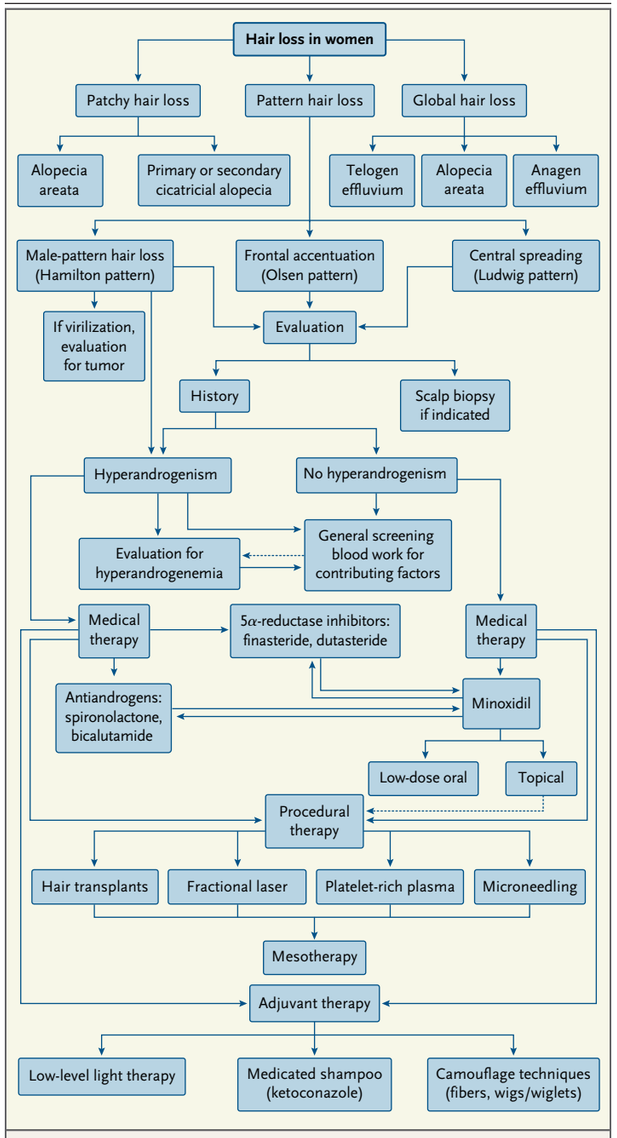


Figure 4. Evaluation and Treatment of Female-Pattern Hair Loss.

TREATMENT OF FEMALE-PATTERN HAIR LOSS

The decision on which treatment to administer first is dependent on the patient's childbearing potential and anticipation of pregnancy in the near future, coexisting conditions including any hyperandrogenism, and history of breast cancer. Most of the treatments used for female-pattern hair loss have not been subjected to randomized, placebo-controlled clinical trials, and comparative assessment of efficacy is difficult. A combination of medications with different mechanisms of action is commonly used, albeit with limited data on whether these combinations provide superior efficacy as compared with monotherapy.[3,19] An algorithm for the evaluation and treatment of female-pattern hair loss is presented in Figure 4.

MEDICAL THERAPY

Minoxidil

The only treatments for female-pattern hair loss currently approved by the Food and Drug Administration (FDA) are a 2% topical minoxidil solution administered twice daily and a 5% topical minoxidil foam administered once daily. Both resulted in hair growth in more than 50% of the participants in a controlled 48-week trial.[20] A 5% topical minoxidil solution administered twice a day, approved only for male-pattern hair loss, is regularly used for female-pattern hair loss, with data to support enhanced efficacy.[21] Minoxidil is converted to its active metabolite, minoxidil sulfate, by sulfotransferases in skin, platelets, and liver.[22] Whether the mechanism by which minoxidil sulfate reverses the miniaturization process is related to the opening of ATP-sensitive potassium channels, prostaglandins, increased expression of vascular endothelial growth factor, downstream activation of the β-catenin–Wnt pathway,[22] or down-regulation of the androgen receptor on follicular dermal papillae[23] is unclear. Common side effects include transient shedding of scalp hair (a positive sign of the transition from the telogen phase to the anagen phase that is shared with oral minoxidil), irritant or contact dermatitis, and facial hypertrichosis.[20,21] Concomitant use of microneedling[24] or low-level light therapy[25] may increase the efficacy of topical minoxidil.

Although oral minoxidil at doses of 10 to 40 mg per day is an FDA-approved treatment for resistant hypertension, low-dose oral minoxidil (defined as a dose of ≤5 mg per day) is commonly used off label to treat a variety of hair-loss conditions. A randomized, prospective trial involving participants with female-pattern hair loss showed that 1 mg of oral minoxidil per day was at least as effective as a daily application of a 5% topical minoxidil solution.[26] Oral minoxidil is rapidly absorbed and, through peripheral vasodilation, may cause a decrease in blood pressure and a potential compensatory increase in pulse rate and cardiac contractility, with these effects peaking at 1 to 2 hours after dose administration. Although low-dose oral minoxidil has no substantial effect on blood pressure in most persons, women may benefit from starting at a dose of 1.25 mg per day or less and escalating slowly as long as unacceptable side effects do not occur.[22] Peripheral edema and hypertrichosis, both of which can manifest after approximately 2 to 4 months of treatment and are dose related, have been reported in 1.1% and 15.1% of patients, respectively.[22] The incidence of pericardial effusion, a rare side effect of oral minoxidil when prescribed for hypertension, is unknown for low-dose oral minoxidil, but both symptomatic and asymptomatic cases have been reported.[22] A sublingual and an extended-release preparation of minoxidil are in clinical trials for pattern hair loss.

5α-Reductase Inhibitors

Both type 1 and type 2 5α-reductase isoenzymes are present in the hair follicle. There are two FDA-approved 5α-reductase inhibitors: finasteride, which primarily inhibits the type 2 5α-reductase isoenzyme, and dutasteride, which inhibits both type 1 and type 2 5α-reductase isoenzymes. Both lead to a decrease in serum dihydrotestosterone and an increase in testosterone and, potentially, estradiol.[27] Neither treatment is FDA-approved for use in women.

A double-blind, randomized, placebo-controlled trial involving 137 postmenopausal women with mild-to-moderate female-pattern hair loss diagnosed clinically, with stratification according to hormone-replacement therapy, showed no significant differences between finasteride at a dose of 1 mg and placebo in hair counts, patient or investigator assessment of response to treatment, or scalp-biopsy results.[28] However, subsequent retrospective case series and nonrandomized prospective studies have documented improvement with daily finasteride at a dose of 2.5 mg or 5 mg in more than 60% of pre- and postmenopausal women with female-pattern hair loss with or without concomitant hyperandrogenism or hyperandrogenemia.[3,29,30]

In a randomized, placebo-controlled trial involving men with male-pattern hair loss, dutasteride at a dose of 0.5 mg per day showed enhanced efficacy as compared with finasteride at a dose of 5 mg per day, with dihydrotestosterone suppression occurring in approximately 90% of men treated with dutasteride and in 70% treated with finasteride.[27] Although oral dutasteride is used regularly in women with hair loss, data on its efficacy for female-pattern hair loss are limited.

Reports of side effects in women receiving finasteride are infrequent but include decreased libido, headache, dizziness, gastrointestinal disorders, depression, increased body hair, dry skin, increased liver-enzyme levels, and irregular menses.[31] Safety issues associated with dutasteride in women appear to be similar to finasteride, but because of the long half-life of dutasteride, its use is best reserved for women of nonchildbearing potential. Topical finasteride may add a level of safety as compared with oral finasteride, with some data suggesting similar increases in hair count but lower levels of plasma finasteride and less reduction in serum dihydrotestosterone levels with topical as compared with oral finasteride.[32] Multiple non–FDA-approved topical preparations of various vehicles and concentrations of finasteride, minoxidil, and other agents that purport enhancement of hair growth are promoted and sold directly to patients online or are available in compounding pharmacies. Because feminization of a male fetus is possible if a 5α-reductase inhibitor or antiandrogen is taken during pregnancy, contraception measures are recommended for women of childbearing potential.

Antiandrogens

The antiandrogens flutamide, bicalutamide, and spironolactone have all shown efficacy for female-pattern hair loss, but multicenter, prospective, randomized clinical trials are lacking. Flutamide and bicalutamide are nonsteroidal antiandrogens that appear to be more effective for female-pattern hair loss than either spironolactone or finasteride.[3,33] However, they are gen-

Table 1. Procedural or Device-Related Options for the Treatment of Female-Pattern Hair Loss.*

Treatment	Potential Mechanism of Action	Controlled Clinical Trials	Limitations of Studies	Side Effects
Microneedling[24]	Induction of percutaneous wounds purportedly leads to release of growth factors that promote angiogenesis, reversal of fibrosis, initiation of anagen, and proliferation of dermal papillae and stem cells. It may also enhance transdermal delivery of topical agents.	Trials have shown equivocal results with microneedling as monotherapy. Most trials showed significant improvement with topical minoxidil and microneedling as compared with topical minoxidil alone.	Limitations have included variation of methods used (depths of microneedling vary between 0.25 and 2.5 mm), delivery method (needling stamps, manual rollers, or automated pens with or without fractional radiofrequency), and frequency of treatments. Studies have been small, and those involving persons with FPHL or that are placebo-controlled are limited.	In general, few side effects are reported. Pain and lymphadenopathy are possible.
Low-level light therapy[25,41]	Devices include lasers (630–660 nm), light-emitting diode, or combination devices in comb, hat, or helmet form. The mechanism for hair growth is unclear, but photobiomodulation promotes anagen and a potential anti-inflammatory effect.	Double-blind, randomized, sham-controlled trials have shown an increase in hair density.[41] Use of a 650-nm low-level laser device with 5% topical minoxidil had greater efficacy than monotherapy with either treatment.[25]	Only a few devices have FDA clearance specifically for MPHL or FPHL, and all are sold online directly to patients. A comparison of results among devices is limited owing to inherent variation in light absorption of skin and hair color, variation in wavelength, and treatment specifics including frequency of use.	Side effects are few but include pruritus, pain or tenderness, paresthesia, urticaria, dermatitis, irritation, dry skin, and headaches.
Platelet-rich plasma[38-40]	Platelet-rich plasma is a blood-derived product with a concentration of platelets that is 3 to 5 times that of whole blood, ideally 1,000,000 per microliter. Therapeutic potential lies with the release from activated platelet alpha granules of various growth factors, cytokines, and cell-adhesion molecules, enhancing a transition of telogen to anagen and prolonging anagen.	Many single-site trials (including half-head-controlled trials†) have shown an increase in hair-shaft diameter from baseline.	All devices are FDA-cleared, but there is no standardization of process (anticoagulants, single or double centrifugation, spin rate, force or duration of centrifugation, activation of platelets, and number of red cells or leukocytes) or treatment specifics (platelet concentration; volume injected; number, depth of, and distance between injections; and frequency of treatments). There are few multisite, paired-comparison, randomized, placebo-controlled trials and few studies of FPHL in which there was a period of washout of other current hair-related treatments.	Local discomfort is the most commonly reported side effect.
Fractional laser treatment[42-44]	Nonablative fractional lasers stimulate hair growth through fractional photothermolysis (i.e., controlled dermal damage) while maintaining the integrity of the epidermis with minimal thermal effect. Ablative fractional lasers penetrate deeper and may have more efficacy but greater risk of side effects than nonablative fractional lasers. Lasers may assist topical drug delivery as well.	A prospective, open-label, single-blind, controlled trial involving patients with FPHL treated with a nonablative 1550-nm fractional laser (10 treatments 2 weeks apart) documented an increase in hair density.[43] In a single-center, retrospective trial, an FDA-cleared nonablative 1565-nm laser resulted in visible hair growth in participants with either FPHL or MPHL.[44]	Studies of fractional laser treatment for pattern hair loss vary with respect to use of ablative or nonablative lasers, wavelength, spot size, energy, interval of treatment, and recommended number of sessions. Because no medication or invasive treatment is involved, fractional lasers have a wide range of applicability to diverse populations with hair loss.	Side effects are related to laser type and treatment specifics and range from mild erythema and warmth to pruritus, dryness, mild ulceration, and pigmentary changes.
Mesotherapy[45,46]	Microinjection of medications (minoxidil, dutasteride, or bicalutamide), botulinum toxin, or various purported growth promoters into the mesoderm (mid-dermis) may bypass systemic reactions of medications and enhance local efficacy.	A trial involving 126 women with FPHL who received dutasteride mesotherapy or saline (12 sessions over 18 weeks) showed significant photographic improvement (62.8% vs. 17.5%) and an increase in mean hair diameter and patient self-assessment with mesotherapy as compared with placebo.[45]	Limitations include variability in agent, concentration, vehicle, solvent, frequency and number of sessions, and injection technique; few placebo-controlled trials or comparisons with an oral agent; a lack of data on blood or plasma levels of the agent used; small studies with or without washout of other hair treatments; and few studies involving participants with FPHL.	Side effects include headache, injection-site pain, local site reactions, infection, frontal edema, and hair loss.
Hair transplants	The goal is to add hair from the occipital scalp that is uninvolved with pattern hair loss to areas with low hair density.	Follicular unit extraction is the preferred method.	Success of treatment depends on the density and caliber of hair in the donor area and control of ongoing pattern hair loss.	Continued medical therapy is warranted to prevent further loss.

* FDA denotes Food and Drug Administration, FPHL female-pattern hair loss, and MPHL male-pattern hair loss.
† Half-head-controlled trials involve administering an active agent on one half of the head and an active control, placebo, or no treatment on the other half.

erally not considered to be first-line treatments for this condition because of the potential for fatal liver toxicity, which is greatest with flutamide. Efficacy has been reported for flutamide at doses of 62.5 to 250 mg per day, with side effects including gastrointestinal symptoms, dry skin, reduced libido, and hepatic toxic effects.[3] Bicalutamide has a longer half-life than flutamide, allowing administration once per day as compared with three times per day, respectively. Retrospective studies of bicalutamide, typically at doses of 10 to 50 mg per day, have shown mild increases of 2.9 to 11.4% in levels of aminotransferases as well as side effects such as peripheral edema, gastrointestinal symptoms, and breast tenderness.[34] Spironolactone is a steroidal antiandrogen and aldosterone antagonist that affects hair growth through interference with ovarian production or secretion of androgens and through peripheral androgen action. Potential adverse reactions associated with spironolactone include breast tenderness, irregular menses, hyperkalemia, polyuria, postural hypotension, and lightheadedness or dizziness.[33,35] A minimal dose of spironolactone of 100 mg per day appears to be necessary for efficacy in female-pattern hair loss.[3] Cyproterone acetate, a synthetic steroidal antiandrogen and progestin, is not approved in the United States but is used in other countries for the hyperandrogenism spectrum of disorders.

Topical antiandrogens for treatment of male- and female-pattern hair loss are currently in clinical trials. Ketoconazole, an imidazole antifungal agent that is FDA-approved as a 2% cream, foam, and shampoo for superficial fungal infections, tinea versicolor, and seborrheic dermatitis, also has antiandrogen properties. An open-label study of a lotion formulation of ketoconazole and a controlled comparative trial of a 2% ketoconazole shampoo as compared with a nonmedicated shampoo have shown hair regrowth with topical ketoconazole in participants with male-pattern hair loss.[36,37] The shampoo is commonly prescribed for female-pattern hair loss.

PROCEDURAL TREATMENTS

Among the procedural treatments for female-pattern hair loss, platelet-rich plasma is one of the most commonly used. Platelet-rich plasma may augment the efficacy of hair-growth medications or provide an alternative treatment option.

Multisite, well-controlled studies are lacking, but many single-site studies have shown an increase in hair-shaft diameter or density (or both) as compared with baseline. The general consensus is that at least three treatments with platelet-rich plasma, administered 1 month apart, are needed to determine efficacy, and continued treatments are necessary to maintain response.[38-40] Procedural treatment options are given in Table 1.[24,25,38-46]

FEMALE-PATTERN HAIR LOSS IN SURVIVORS OF BREAST CANCER

For survivors of breast cancer with female-pattern hair loss, minoxidil (topical or low-dose oral) is an effective frontline therapy.[47] On the basis of large-scale studies,[48] spironolactone is considered to be a low-risk treatment in survivors of estrogen receptor–positive cancers, whereas 5α-reductase inhibitors and other antiandrogens should be avoided in this group of patients until further safety data are available. Low-level light therapy, microneedling, nonablative fractional laser treatment, and hair transplants are reasonable additional treatments in this population.

AREAS OF UNCERTAINTY

Well-controlled clinical trials involving women with a firm clinical and histopathological diagnosis of female-pattern hair loss that take into account key variables, including age at onset, race or ethnic group, the presence or absence of hyperandrogenism or hyperandrogenemia, and menopausal status, will help to identify potential new genetic, hormonal, and environmental factors that are key to prognosis and effective treatment. Comparative-effectiveness trials are warranted to assess the relative efficacy of individual agents as well as the benefits and safety of combinations of agents with different mechanisms of action.

GUIDELINES

The most recent guidelines for female-pattern hair loss are based largely on consensus expert opinions. The guidelines highlight the lack of high-quality data for the treatment of female-pattern hair loss outside of topical minoxidil.[49,50]

CONCLUSIONS AND RECOMMENDATIONS

The patient in the vignette has a combination of late-onset female-pattern hair loss, chronic telogen effluvium, and hirsutism. Her workup revealed mildly elevated free and total testosterone levels but did not indicate the source of telogen effluvium, as is often the case. A biopsy was not essential for diagnosis.

I would start treatment with combination therapy, either spironolactone or finasteride for both the hirsutism and the female-pattern hair loss and either topical or oral minoxidil to address both the female-pattern hair loss and the chronic telogen effluvium, providing counsel on the continued need for contraception while she is still of childbearing potential. Standardized photographs of the central scalp with a midline part (as shown in Fig. 2) are a simple and effective measure to help both the physician and the patient determine the efficacy of treatment, and trichoscopic evaluation of changes in hair-shaft diameter and density documents the mechanism of improvement.

Disclosure forms provided by the author are available with the full text of this article at NEJM.org.

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