

Part One: General Considerations in the Head and Neck

Chapter 1: History and Physical Examination

Loring W. Pratt

History Taking in Head and Neck Disease

The history, in the past called the *anamnesis*, is undoubtedly the most important part of the physician's evaluation of the patient's problems. If physicians could have either an excellent history or a well-done physical examination, they would opt for the excellent history. The history taking provides the physician the opportunity to explore and evaluate in detail the events surround the problems that bring the patient for medical help.

The method of taking the history is of critical importance, and there are some rules that should be followed, although in some circumstances and under certain adverse conditions they may not apply. These suggestions are made for the typical patient in a nonemergent situation who is seen in the office setting for consultation. At the time of first contact, a complete history should be taken to serve as a baseline for subsequent evaluations, and this history should be recorded either in the examiner's handwriting or by dictation. In legal action, the legible hand-written record, recorded at the time of examination will give greater strength to the physician's position than a dictated record. It is often well to record pertinent legible notes by hand and keep them as part of the permanent record, even if a more complete and detailed record is dictated at the time. Dictation should be done at the time of consultation while the details of the history are clearly in mind.

Both the patient and the physician should be comfortably seated, as should those accompanying the patient, to dispel any suggestion of haste or lack of consideration, which is sometimes attributed to physicians during consultations. The first contact with the patient is of critical importance to the future development of the physician-patient relationship. If patients are to feel that physicians are genuinely interested in them, physicians must allow patients enough time to tell of their problems and the details that they feel are important, even if the physician feels that these details are irrelevant. Too often, physicians will wish later that they had listened more carefully to the proffered information.

It is at this first visit that the physician can establish rapport with the patient on the basis of which he may well avert the specter of future litigation, regardless of how the medical problem develops. It may be that in this first contact the physician will engender animosity in the patient, which will lead to future litigation if all does not turn out exactly as the patient wishes. Dr. Warfield Firor, Acting Professor of Surgery at Johns Hopkins Hospital in the early 1940s, once said that if you sit down and talk with a patient for 5 minutes he will feel that you spent half an hour with him, whereas if you stand, shifting from foot to foot, obviously anxious to leave, he will believe you spent only 2 or 3 minutes with him even though you may indeed have spent half an hour. This atmosphere of unhurried relaxation, with complete devotion of your attention to the patient and his problems, during the course of the history taking is all-important and should not be neglected when making initial contact with the patient. This principle also applies to return visits, when spending some time sitting with the patient will make him feel that he has your undivided attention;

this is essential to developing a proper physician-patient relationship.

The patient should be asked his reason for coming for consultation, and this statement, the chief complaint (CC), should be recorded in quotation marks in the patient's own words. It is not uncommon to find that often the patient's view is important even though it is different from the physician's view. No effort should be made to put words into the patient's mouth or to alter this statement from the way it is given. In retrospect this first statement may prove to be more revealing than originally thought.

Once the problem has been stated, it is important to find out how long it has caused concern, when it first appeared and how it was first manifest, how often it has occurred in the interim, and whether or not it is worsening or improving. Is it incapacitating and does it interfere with daily activity? The physician should avoid the use of leading questions and should always ask the question in language appropriate to the individual being examined. The physician will inevitably encounter an occasional patient who is not "a gifted witness" and in these situations he will have to make do with a less-than-desirable history, unless family or friends are able to supply the needed data.

When attention has been directed to a particular organ system, it is then possible to explore more directly the specifics of the problem. It is probably best to discuss details associated with the chief complaint first, rather than to take a systematic history, and perhaps deal with the chief complaint at the end of the interrogation. The patient may feel that the examiner has lost track of the primary problem if a more general history is taken first. The background data, such as system review, may be acquired once the present illness has been thoroughly documented.

It is well, however, to follow a general format in history taking so that the patient's problems are approached in an orderly manner. It is also well to learn about previous surgery before taking the detailed history. An account of all previous surgical operations, whether or not they involve the head and neck, will give the physician information about the patient's previous illnesses and health problems.

A history of smoking habits, recorded in packs of cigarettes per year, number of cigars per day, or number of hours of smokeless tobacco use per day, in addition to number of years of use is important information. A history of alcohol intake is essential to the development of a good picture of the patient's situation and is of importance when assessing patients with head and neck malignancies. A history of recreational drug use is essential, and, especially in patients who are likely to undergo surgery, a history of HIV exposure and/or infection should be determined.

A review of systems, searching for problems that might affect the otolaryngologic systems, as well as information about the patient's systemic health should always be gathered, and with this a review of the family health history in regard to inheritable diseases or those that may be spread by contact should also be recorded. Specific queries concerning diabetes, hypertension, cancer, hepatitis, tuberculosis, and HIV infection should be directed to the patient.

Questions concerning ear disease should include the general categories within which trouble may arise, such as infections and problems of hearing and balance.

A history of infections in childhood, nonsuppurative otitis media, the insertion of equalization tubes, otorrhea, hematotorrhea, pain, mastoiditis, mastoid surgery, chronic otitis media, traumatic rupture of the tympanic membrane, and any other items that the family feels are important should be recorded. In this regard, a history of allergy, breast feeding, bottle feeding, and the use of "propped" bottles may well be relevant to the onset of ear infections in infants.

Hearing problems in childhood, associated with either suppurative or nonsuppurative disease, must be documented with the age of onset, duration of disease, and history of recurrences. Sensorineural hearing loss, and exposure to excessive noise levels either on the industrial front, such as the noise of machinery, farm tractors, chain saws, and woodworking equipment, or as a result of explosions such as firearms and firecrackers are important factors. It should not be forgotten that some children's toys with whistles and squeakers, and some cap pistols may produce sound levels of damaging proportion when they are held close to the child's ear. Nerve deafness may be seen in small children as a result of this sort of exposure. The child who accompanies his father to the skeet range or who helps with sanding or chain-saw work may become the victim of nerve deafness from acoustic trauma at an early age. Teenagers and others who frequent rock and roll concerts or who listen to excessively loud music, especially while wearing head sets, are often candidates for sensorineural hearing impairment.

When exploring the problems of hearing impairment, queries should be made about family members who are also hard of hearing, the age at which the impairment was noticed, and the type of loss. Although congenital or inherited sensorineural loss is important, otosclerosis is also an inherited problem, one that requires an entirely different therapeutic approach from that of neural loss. The association of tinnitus with hearing loss and especially the inability to discriminate words is of special help in making the differential clinical diagnosis. Often the person with hearing loss will admit to coming to see the physician at the insistence of his family. When asked, "But what is your problem?". The person will answer, "I don't have a problem; my family has the problem. If only they would speak up a little, I would not have a problem". This is a common history obtained from older patients who have significant sensorineural hearing loss.

One should always explore the possibility of exposure to toxic chemicals and medications such as salicylate, quinine, streptomycin, dihydrostreptomycin, gentamicin and other aminoglycosides, intravenous erythromycin, diuretics, and Cis-Platinum.

Tinnitus is a common complaint that we can, unfortunately, do little about except in unusual cases. A history of salicylate and quinine ingestion should be taken, and if that seems to be a factor, elimination of the medication may be of great help. The nature of the tinnitus should be evaluated and its pitch determined, if possible. It should be noted whether it is continuous or intermittent and especially if it is pulsating. Pulsating tinnitus should alert the examiner to the possibility that a vascular lesion is the cause of the disturbance.

Problems of balance should be discussed, and an attempt should be made to determine the type of unsteadiness and loss of balance. The time of onset, frequency, and violence of attacks is of prime importance. It is desirable to determine whether or not there is a rotary component to the attack, and whether it is associated with drop attacks, nausea, vomiting, or unconsciousness. Any association with hearing loss, tinnitus, stuffiness of the ear, or diplopia should be noted.

A history of previous otologic surgery provides important data and should include exact descriptions of the types of surgery performed, the dates of that surgery, and the results from the patient's point of view.

The nose presents specific problems in the history taking because the history must include structure, function, and past diseases. A history of nasal trauma and nasal surgery is important. Details of these events should be explored and an attempt made to determine the exact nature of any surgical procedures.

Many patients say that "sinus" is their chief complaint. At least 98% of these patients do *not* have sinusitis as the otorhinolaryngologist knows the disease. They usually have postnasal discharge, nasal discharge, headache, or some other problem unrelated to sinusitis. It must be remembered that the symptoms of sinusitis are usually rather specific, are related to the particular sinus involved, and depend upon whether or not the disease is acute or chronic. In acute sinusitis the patient usually rises in the morning without a headache. A headache develops shortly, disappearing in the latter part of the forenoon. Although this is a general rule for acute sinus infections, it is not applicable to all cases. In acute sinusitis the pain is typical and different depending on which sinus is involved. For example, acute frontal sinusitis is characterized by severe pain in and over the region of the frontal sinus, and, if periostitis has developed, exquisite pain and tenderness over the frontal sinus. The maxillary antrum produces pain in the upper molar teeth, pain about the eye, and sometimes point tenderness at the medial end of the homolateral eyebrow. The ethmoid sinus, when infected, usually produces a more vague sort of generalized headache, often located between the eyes or in the top of the head. It is more difficult to pinpoint the pain from these sinuses. Sphenoid sinusitis causes "fore and aft" discomfort, producing pain both in the frontal region and the occiput and also a general, ill-defined pain in the vertex of the head. Fortunately the latter sinuses are not commonly involved with infection; infections are usually associated with nasal obstruction and discharge on at least the involved side and sometimes on both sides of the nose. Any questioning should attempt to clarify the points mentioned above.

The subject of nosebleed may suggest several different kinds of problems. Slightly bloody nasal mucus may be the early sign of malignancy. However, vigorous nose blowing, the dry ambient atmosphere of the cold northern regions of the USA or of the arid Southwest, and perhaps nose picking may account for epistaxis. The child who picks his nose is likely to have recurring episodes of epistaxis until the habit is identified and terminated. Especially in the adult, epistaxis that is profuse and sometimes runs down the back of the throat must be taken seriously, and a careful search must be made for the source of bleeding because these cases can be serious and it is difficult to locate the exact source of the bleeding. The relationship of bleeding to recent or past nasal surgery should also be explored.

It is important to take a history of bleeding tendency and familial episodes of bleeding and/or blood dyscrasias in all patients in whom the potential for surgery arises. Disaster can often be averted by careful investigation of the patient's personal and family history.

A history of untoward results from anesthesia in other family members should be taken in an effort to identify potential instances of malignant hyperthermia.

One of the most common complaints seen by the otolaryngologist is recurring sore throat or tonsillitis. In eliciting the history of this disease, it is essential to discuss in some detail the type of sore throat bothering the patient. For example, one must determine if the sore throat is acute or chronic, recurrent or persistent. A history of the frequency of infections, their duration, and the completeness of their cure between episodes should be obtained. Were antibiotics used and were they begun at once or were they initiated after some delay? Was the response to the antibiotic good or did the infection persist? Is there or has there been any history of infectious mononucleosis? How many episodes of tonsillitis that required treatment has the patient had in the past few years? Is the infection minor enough that the patient is able to continue his usual activity without too much inconvenience? Is swelling of the cervical lymph nodes associated with these infections and does the swelling disappear when the sore throat subsides or does the swelling persist? Such questions are necessary to evaluate the patient's history so that it will clearly indicate or contraindicate surgery.

The presence of postnasal discharge may be related to nasal and sinus disease, but it may also be associated with disease of the nasopharynx. The presence of bloody postnasal discharge in the morning, or postnasal discharge without blood is important. The amount and frequency of postnasal discharge and its relationship to other infections and diseases should be determined. Bloody postnasal discharge must always be considered a potential harbinger of nasopharyngeal cancer and must not be dismissed without careful review of related symptoms.

The larynx must be investigated with regard to problems of breathing and speaking. Shortness of breath and wheezing may be distinguished from asthma by careful history taking and questions concerning the presence of sibilant rales and whether the wheeze is located in the chest or neck. The duration, onset, and severity of the wheezing must be evaluated. Especially in children, consideration should be given to the presence of a foreign body lodged either in the larynx or in the lower airway. Many times the patient is too young to provide accurate information and the parents may be completely unaware of a foreign body in the child's airway. In addition, especially in very young children, a history of the presence of hemangioma either absent or present at birth that has enlarged in the first 6 months of life, the possibility of a subglottic hemangioma should be entertained. Further, if there is no such history and the problem has been gradually getting worse, the possibility of a major vascular malformation with tracheal compression must be considered.

In cases of hoarseness, information about smoking, voice abuse, and trauma must be sought. In addition, the history of previous laryngeal or other surgery that necessitated the introduction of an endotracheal tube must be evaluated. The temporal relationship between these procedures and presentation for consultation must be determined. In adults, one must investigate the possibility of acid reflux from the esophagus with spillover into the larynx being the prime cause of trouble. The patient may not be aware of this common nocturnal

occurrence.

Dysphagia must always be investigated. Again, the time of onset and whether it was gradual or abrupt must be determined and the severity of the problem should be evaluated. Is the dysphagia complete or partial and is it associated with regurgitation of food, bleeding, and/or regurgitation of blood? Is the condition painful? Has the patient ever ingested corrosive chemicals that might have caused damage to the esophagus, and if so, what were they and what is their relationship to the present symptoms? Does the food bolus pass with time? Has the patient found it necessary to cut or chew his food finer, eat a soft diet, or blend food in order to swallow it? This information will give some indication about the presence of congenital or acquired strictures, hiatal hernia, and malignancy.

At the end of the consultation, the physician should always give the patient an opportunity to volunteer information that may have been omitted or that the patient feels is relevant. A general question, such as, "Is there anything else that I should know about you or that you want to tell me?" will usually elicit such material.

No matter how busy the physician is, a brief but complete system review should be made on all patients. The physician should appear to be calm and unhurried. If he is able to accomplish this, the patient will be confident that he is receiving good care, which will go a long way towards establishing an excellent relationship.

In evaluating previous medical treatment it should be remembered that the patient may have a different view of treatment or may give an incomplete picture of the care administered by another physician. It is wise in most cases to have the patient sign a release and to obtain a copy of the previous physician's record so that an accurate account of previous illnesses and treatments is available.

The history should be taken with care and all information should be explored in a systematic, detailed fashion so as to obtain an accurate picture of the situation. Much time will be saved on subsequent visits because a complete history has been taken and only the pertinent events since the last visit will need elucidation at that time.

Physical Examination of the Head and Neck

The physical examination should take place in comfortable surroundings that afford privacy. Ideally, the patient's chair should be one that can be elevated easily, such as a motor-driven or hydraulic chair. It should be equipped with an adjustable head rest. It is most important to place the patient's head on a head rest that keeps it steady so that the examination may be carried out without causing discomfort to the patient and without unnecessary delay.

All patients should be considered HIV positive, and for this reason the physician should take proper precautions to protect himself and subsequent patients from being contaminated by this virus. Unprotected physicians routinely become soiled with nasal or oral secretions that are often contaminated with fresh blood; this should be scrupulously avoided. The physician should always wear a cap, mask, glasses and/or face shield, and gloves while conducting the physical examination.

Special care should be given to the examination of the child. A few moments spent talking with children about unrelated matters such as their hobbies, Ninja turtles, Barbie dolls, and the like will establish rapport that will save both the child and the physician time and aggravation. Be frank with the child and tell him what you are going to do and why. If a procedure is likely to be uncomfortable or painful, tell the child so shortly before the event occurs. Be gentle and patient at all times, regardless of the difficulties encountered in dealing with a particular child. If it proves impossible to secure the child's cooperation, consider the possibility of using a papoose board to restrain very small children, or general anesthesia to examine older children. Sedation is rarely effective for this purpose.

It is undesirable to force the examination physically upon the child. This will make future physician-patient encounters more difficult. It is often well to examine the normal ear first. For example, if the child turns his head away just as the otoscope touches his ear, say, "That's good, now let me see the other one". The child will realize that examining the first ear was an innocuous procedure and will turn his head for examination of the other ear and also hold still for long enough to accomplish a complete examination of the second ear. Then the examiner can say "Good, not let's take another look at the other ear". Now he has the opportunity to look at the first ear in a leisurely fashion. Had the examiner, however, insisted on a complete examination of the first ear initially by restraining the child's head, the entire examination might well have become a pitched battle. Be gentle with all patients, but especially with children; be deliberate and take your time. If it is necessary to do an unpleasant or painful procedure, do it last so that the majority of the examination will have been accomplished with a maximum of cooperation, and tell the child about the procedure just before performing it.

Good record keeping is essential to the practice of medicine and recording the physical examination is no exception. Many physicians record their data on forms, and others dictate their findings immediately after completing the examination. It is important that this be done promptly to avoid inaccuracies. When lesions are visualized it is well to sketch the lesion, preferably on one of the standard anatomic charts available for this purpose. A chronologic record with such sketches will provide an excellent basis for evaluating the progress of the patient. Photographs of lesions provide excellent documentation and are desirable for many reasons: they not only provide a superior record of the lesion and its progress, but they are an invaluable source of lecture and teaching material. Good records, written legibly at the time of or immediately following the examination will bear much more weight in court than those dictated or written at a later time.

Armamentarium

The physician may examine the patient either from a sitting or from a standing position, depending on personal preference and the equipment available for examination. One of the real virtues of mechanically elevated chairs is that it is possible to sit or stand while examining the patient. These chairs can be adapted to either position in a matter of seconds.

The instrument cabinet should be within easy reach of the physician and the instruments must be autoclaved between patients. It is desirable to keep them wrapped in basic packets so that unused instruments will not become contaminated. More specialized instruments may be handed to the physician by the nurse who should be in attendance during

the examination. The instrument cabinet should be equipped with both air pressure and suction. Spray bottles should be placed on the air pressure side of the cabinet for vasoconstricting solutions that may need to be sprayed into the nose. Irrigation bottles may be used to clean ears and suction must be available to clean the ears and the nasal and mastoid cavities. This access to instrumentation makes patient evaluations and treatment quicker and more comfortable and efficient.

Most individuals are either right-eyed or left eyed and that preference may be easily determined by testing with a monocular microscope. Most individuals will automatically use one eye or the other and will use the same eye to view the microscopic field. Once this preference has been determined, lighting may be arranged to suit the physician.

If the physician is right-eyed, the light should be positioned behind the patient's left shoulder. The physician should sit on the patient's right side and hold the nasal speculum with the left hand. Thus the light beam is completely unobstructed, the examiner will have the best possible view, and his right hand will be free to use for delicate manipulation. If the physician is left-eyed, the illumination system should be reversed and the speculum should be held with the right hand. Both these options assume that the physician will be using a head mirror for the examination. It is usually desirable to place lights on each side of the examination chair so that physicians of either eye preference will be accommodated and no time will be lost moving the light back and forth to accommodate the preferences of different physicians.

The head mirror is a remarkable instrument. Although it was invented many years ago and its origin is clouded in antiquity, it is the most convenient and best designed of all lighting instruments for examination of the patient. The head mirror is a convex mirror with a hole in the center that focuses rays of reflected light at a point related to the focal length of the convexity of the mirror. Different focal lengths are available, and it is possible to experiment and choose the most convenient focal length. A corrective lens or a magnifying lens may be cemented over the hole in the head mirror to correct any visual defect that the examiner may have. The mirror is positioned over the appropriate eye so the physician may see through the hole in the mirror and look directly along the center of the beam of light, thus illuminating deep cavities and recesses. The light bulb used to supply the light should be frosted with a clear spot about 2 cm in diameter on its side. This allows the examiner to focus light from the filament on a particular spot and illuminate that area more brightly than the rest of the field of view. In moving the field of view from one area to another, the physician should rotate about an arc, of which the focal point of the head mirror is the center. Practice, to gain familiarity with this instrument, is essential. Using a pen cap, it is possible to explore the depths of the cap by directing the light from the head mirror into it and moving it about to learn the technique of rotation about the focal point of the head mirror.

Although electric head lights have certain advantages, only a few can illuminate deep recesses as well as the simple head mirror can. In many lights the light source is located between the eyes like a cyclops, and the light may be focused to converge on a certain point. This is convenient for looking at surface lesions. However, it is not as effective as the head mirror for intracavitary examinations. Some electric head-lights reflect incandescent light from an angulated mirror, with a hole in the center. These lights function in much the same manner as the conventional head mirror, providing excellent illumination within the depths of a cavity. Good illumination in the posterior part of the nose may be obtained and it is possible

and practical to use these instruments for intranasal surgery as well. Whatever source of light is chosen, the examiner must be able to look within the beam of light in order to see into deep recesses without loss of illumination.

Telescopes have been used for many years in routine nasal and nasopharyngeal examination. These instruments were first used in the 1930s and have been a routine part of the rhinologist's armamentarium since that time. The first short electric female cystoscope with right-angle lens and illumination supplied by one "grain of wheat" incandescent bulb was made by American Cystoscope Makers, Inc for intranasal work and examination of the nasopharynx. This has not been supplanted by the Hopkins Rod telescope, which is a much better instrument. These telescopes are made with fiberoptic light supplies and come in a variety of angulations of view: 0, 30, 70, 90, and a retrograde 120 degrees. These instruments permit a much more complete and accurate examination of the nose and the intranasal structures than is possible with the head mirror or forehead-mounted electric light alone. Similar progress has resulted in the development of an otoscopic telescope, and it is likely that before long it will be possible to examine the middle ear with tiny telescopes passed through perforations in the tympanic membrane or fiberoptic bundles passed up the eustachian tube; these telescopes will be useful for the evaluation of middle ear disease and the diagnosis and surgery of diseases of the nasal chamber.

It is important to remember that the telescope magnifies only a small area of the region being examined and one must be able to build up a composite picture of the particular area in his mind. It is necessary to practice for many hours with the instrument in order to really understand the normal anatomy and its variations, as well as the pathologic anatomy of the region being examined. For this reason, every patient should be examined with these instruments to provide the examiner with the maximum amount of experience possible in evaluating intranasal anatomy, so that he will readily recognize abnormalities and pathological processes.

Nasal speculums are many and varied. They come with blades of different lengths and shapes for use in specialized procedures, such as examination of the posterior naris and for surgical procedures. The usual instrument has relatively short blades that are used to open the anterior naris so that light may be directed into the nasal cavity, illuminating it fully. Because the springs that help to hold the speculums open are of varying strengths, it is sometimes difficult for the examiner to know how much force is required to open the nose. It has been our practice to discard the springs so that the degree of pressure exerted by the blades on the nostril is plainly evident. It quickly becomes convenient to open and close the nasal speculum with one hand. The speculum should be held so that it casts no shadow into the nose. In addition to the usual conventional nasal speculum, a two-pronged, ball-pointed nasal hook is useful because it does not cover the vestibule during the examination process.

Tongue blades are made of either wood or metal. In the Far East they are made of bamboo, which is well suited for this purpose because it is very smooth and quite stiff. The disposable wooden tongue blade is convenient and has served our specialty well over many years. Samuel J. Crowe, Professor of Otolaryngology at Johns Hopkins, insisted that the tongue blade be made wet before being placed on a patient's tongue, in the interests of patient comfort. He resterilized tongue blades following use and the water-soaked tongue blade from the boiling sterilizer was reused and placed on the patient's tongue while wet. Metal tongue

blades are usually angulated and make it easier to exert pressure on the back of the tongue when it is necessary to obtain a better view of the posterior pharyngeal wall or the base of the tongue.

Laryngeal mirrors and postnasal mirrors come in various sizes and are essential to examination of the larynx and nasopharynx when used in conjunction with a coaxial light source. These mirrors come with a standard angle between the mirror and the handle. This angle may not be appropriate for the patient at hand, but the mirror's malleable handle makes it easy to readjust this angle to suit the needs of the patient. In general, larger mirrors are used for examination of the larynx and smaller ones for the nasopharynx. The alcohol lamp was used for many years to heat the mirror; it is probably the most convenient method and has the lowest risk of cross contamination. However, the examiner must remember to test the mirror's temperature on the back of his hand before inserting it into the patient's mouth to ensure that it is not too hot. The same mirror can be reheated without danger of subsequent contamination of another patient. There are convenient electrically heated devices for warming laryngeal mirrors. These include little electric warming ovens, containers of fluid or sand or glass beads that are maintained at a constant temperature, thus providing instant access to warm mirrors for examination. These instruments function well, but replacing the mirror in the warming chamber may introduce infection into the warming medium; therefore a new mirror must be used for each examination, even repeat examinations of the same patient. If many patients are to be examined at regular intervals, a large number of mirrors is required. The most practical solution to this problem is to use a drop of an anti-fog solution such as dentists use to control the fogging of dental mirrors. This solution easily prevents fogging, without the necessity of warming the mirror, and may be kept in a small dropper bottle so that the mirror can be reused as many times as needed. With this technique the mirror does not become hot and so does not present a potential hazard for burning the patient.

Otoscopes, or ear speculums, can be used either with an electric light source or a head mirror. Although it is good practice to use the head mirror and make a preliminary examination of the ear canal using the hand-held ear speculum, for further examination of the ear drum and the depths of the ear canal, an electrically illuminated otoscope with a magnification of at least 2x is more suitable. It is also desirable to have access to a microscope so that the ear may be examined in greater detail by higher-powered magnification. The microscope may be positioned so that it may be used routinely in conjunction with the examination chair, but if significant manipulation within the ear is to be accomplished, both examiner and patient will find it more convenient to have a table or cot on which the patient may recline while the physician is working. A Siegel otoscope is essential for altering pressure in the external auditory canal and studying the motion of the tympanic membrane. This may be used either with the head mirror or with the operating microscope, and, in addition, the use of a rubber bulb attached to many of the closed-head otoscopes will provide another convenient way to study the mechanics of the tympanic membrane during change of pressure within the external auditory canal. If the ear or mastoid cavity is to be cleaned, the adult patient will usually tolerate gentle suctioning of the cavity. Children are sometimes disturbed by the noise of the suction and respond better if the ear is cleaned with a wisp of cotton on an applicator. The use of suction has distinct advantages because the suction tip is sterile and introduces little or no contamination into the ear. The cotton-tipped applicator must be prepared using aseptic precautions; despite this, it may pick up skin flora and introduce it into the ear as the applicator passes into the external canal. It

may be a more acceptable technique for use on children, however.

Tuning forks are an essential part of the examination equipment. Although it is desirable to have a complete set of tuning forks available (64-4096 Hz), the minimum should be a 512 Hz steel fork. Magnesium forks are more easily available and are commonly found in examination rooms; however, the 512-Hz steel fork provides a balance between acoustic and vibratory energy and is ideal for determining the difference between air and bone conduction. In addition, the steel fork produces enough energy so that this determination may be made with ease. It is not generally necessary also to test with 256-Hz and 1024-Hz forks to assess the relationship between air conduction and bone conduction (Rinne test). The Weber test is easily and accurately done with this fork. While taking the history and performing the physical examination, it is easy to assess the functional level of the individual's hearing. If one suspects that the patient is an accomplished lip reader, the examiner should ask a question or two while turning away from the patient; doing so will help to clarify this problem.

Radiographic studies should, if indicated, be performed after the examination. In some instances they may be done before the examination in the interest of saving time and accommodating the radiologist's schedule when it is clear at the outset that x-rays will be needed. However, the logical sequence is to take x-rays after conducting the examination. If the x-rays or scans are available at the time of the examination, it may be possible to save the patient a subsequent visit to the physician, an important consideration when dealing with patients from out of town.

Sinus and mastoid x-rays are helpful in determining the extent and severity of disease; however, CT and MRI scans add an extremely valuable dimension to the radiographic studies of the head and neck. These scans make it possible to see and delineate lesions that cannot be detected by x-rays alone. The precision that these studies contribute to the physician's diagnostic ability is enormous and has grown within the past few years.

Flexible fiberoptic telescopes are useful for examining the larynx in patients who are unable to cooperate during examinations that use the laryngeal mirror. These telescopes may be passed either through the mouth or nose and provide good illumination and visibility of the larynx. They make it possible both to study the movements of the vocal cords and the presence of a lesion or lesions within the larynx. Video recordings add greatly to the value of the examination because they provide a permanent record that may be studied at a later date or compared with other studies of the larynx made subsequently. The angulated telescopic laryngoscope provides even better optical visualization of the larynx, but is more difficult to position in some patients. The added advantage of synchronization with stroboscopic light sources provides an even better optical representation of the movements of the vocal cords. After every use these instruments must be sterilized with HIV- and mycobacterium-destroying agents.

A "through-the-lens" 35-mm camera, equipped with ring strobe for intracavitary photography and a regular strobe light for surface photography with macrophotographic capability, provides documentation of lesions identified in the course of examination. Equipment for video recording of laryngeal examinations is also desirable. With these tools and devices, the examiner is properly equipped to examine the patient.

Examination

Examination of the patient should follow a routine and should be performed in a systematic fashion. The order in which the various steps of the examination are carried out is not of importance, but the physician who develops the habit of following the same order for each examination is less likely to omit an important part. The following routine is an example of a satisfactory examination procedure.

Neck

Palpation of the neck is performed with the physician positioned first in front of and then behind the patient. Although it is often possible to examine the neck adequately while standing in front of the patient, in general, palpation with the physician standing behind the patient with fingers curled around the patient's neck is more satisfactory. Fingertips are generally more sensitive than thumbs, and it is better to use the fingertips to palpate the neck, rolling the tissues beneath the fingers and compressing them against the vertebral column and the larynx. The thyroid gland should be identified and palpated. The patient should be asked to swallow to determine whether or not the gland moves up and down on swallowing as a way of confirming the fact that the mass is indeed the thyroid gland. Palpation of soft tissues should be carried out from the clavicle to the base of the skull. Palpation of the head and scalp, searching for masses, asymmetries, and neoplasms is done during this part of the examination.

Salivary glands

These are palpated as part of the examination of the neck. It is also desirable to perform a bimanual palpation of the salivary glands, using a gloved finger in the mouth while the other hand palpates the overlying tissues to evaluate their size and consistency, and to look for the presence of any masses within these glands. The orifices of the salivary glands are seen readily during examination of the oral cavity. During examination, slight pressure over the body of the gland will stimulate secretion, which will give information about the type of material being secreted by the glands.

Ear

Both ears should be examined in every case. Either the electric otoscope or the ear speculum with the head mirror may be used to examine the external ear canal, but the electric otoscope with magnification should be used to examine the depths of the ear canal and the drum head. In order to accomplish this most easily, the ear canal should be straightened so that good visibility of its depths is obtained. The adult pinna is pulled up and backward while the speculum of the otoscope is inserted; in the infant or young child the pinna is pulled down and back to straighten the ear canal. The presence of cerumen or discharge in the ear canal should be evaluated, and if either of these materials interferes with complete visibility of the tympanic membrane, the ear should be cleaned (by suction, curettage, or irrigation) before proceeding. If a culture is needed, it should be taken before any cleaning of the ear is begun. The tip of the ear speculum should not be inserted beyond the junction of the membranous and bony canals because the bony canal is very sensitive and the slightest trauma may produce pain in addition to a hematoma that will interfere with subsequent examination. The

configuration of the tympanic membrane and middle ear should be studied and evaluated; then a systematic review of the tympanic membrane and middle ear should be performed. The physician should look for the position of the tympanic membrane, the presence of plaques or scars, and the presence of perforations. Care should be taken to determine whether perforations are marginal or central in location. Does the tympanic membrane have its normal convex shape and does the light reflex appear normal? One should look for the long process of the malleus, the short process of the malleus, and, if the tympanic membrane is reasonably transparent, the incudostapedial joint, the promontory, and the niche of the round window. In occasional cases it may be possible to see the chorda tympani crossing the middle ear between the malleus and the incus. If the tympanic membrane is perforated, it is often possible to see middle ear structures such as the incudostapedial joint, granulation tissue, and cholesteatoma directly through the perforation. It is important to look for and evaluate these structures on each normal ear on the basis of which to judge pathologic alterations in diseased ears. Notes regarding the size and location of perforations must be kept. Drawings are of special help in delineating the location of such abnormalities and in providing objective data that may be used in the course of subsequent care of the patient.

Although audiometric examination is the most desirable way of making a permanent record of hearing, the use of tuning forks in the examining room is desirable. Using a 512-Hz steel fork, air conduction is compared to bone conduction (Rinne test) and the reference of sound to one or the other ear (Weber test) is evaluated. This immediately gives the examiner a good indication of the type of hearing loss, if any, and, to some extent, of its degree. Audiometric studies provide a reliable, repeatable assessment of the individual's hearing and should be performed on all patients with hearing loss or suspected hearing loss. In my opinion, all patients should undergo at least a simple audiogram at the time of their first visit to an otorhinolaryngologist. This can be useful in identifying unsuspected hearing loss and to record normal hearing so that subsequent examinations may be compared with this initial test.

Nose

Examination of the nose should begin with the external nose and should include a general description of the shape of the nose. Is it straight, humped, deviated to right or left, or characterized by a "C", "S", or "reverse S" deformity? The vestibule is then examined with the help of a ball-pointed, two-pronged nasal hook, one that will not cover and hide a lesion of the nasal vestibule. In rare instances it may be necessary to remove (clip) the vibrissae in order to examine the interior of the nostril adequately. The patient's head must be positioned so that the examining light passes to the depths of the nasal chamber. The septum can then be evaluated. Deviations and spurs should be looked for and the position of the septum on the pedestal of the maxillary spine should be determined. The turbinates should then be examined and the degree of mucosal engorgement evaluated. If they are swollen or if they interfere with complete examination, they may be shrunk and reduced in size by applying a vasoconstrictor solution, such as 1% ephedrine, to the nasal mucosa. If it is desirable to examine the interior of the nose with telescopes, 4% cocaine and/or 5% xylocaine may be applied topically to the nasal mucosa to provide both the vasoconstriction and anesthesia needed for this examination. The patient must be queried about possible sensitivity to cocaine or other topical agents used in the nose before they are applied to the mucosa. Telescopes may be passed so that the posterior choanae and all the turbinates may be well visualized. It

is often possible to pass the 90-degree or 120-degree retrograde telescope beneath a deviation in the septum or obstructing nasal polyps so that the posterior part of the nose and the orifices of the sphenoid sinuses may be examined adequately, even though they cannot be seen on anterior rhinoscopy. The 0-, 30-, and 70-degree telescopes may be insinuated into the middle meatus to evaluate the natural orifice of the maxillary antrum and the openings of the ethmoid sinuses for size, obstruction, and discharge. The infundibulum can be visualized and evaluated at this time. Using the variety of telescopes available, it is often possible to look through the natural orifice of the maxillary antrum into the lumen of the sinus and gather further information about the condition of the mucosa within the sinus. Patients who have had antrostomies may have the new window evaluated, and in most cases it is possible to pass the telescope through the antrostomy window and inspect and evaluate the mucosal lining of the entire sinus cavity. Telescopes should be passed into each nostril to make a complete examination because each nasal chamber must be evaluated separately.

Palpation of the maxilla and infraorbital region is often done to search for tenderness in this area. Some suppose that tenderness is indicative of underlying maxillary sinusitis. Tenderness in this region is much more likely to be caused by dental disease and dental abscess; maxillary sinus infections rarely produce periostitis, so tenderness is not typical of underlying maxillary sinusitis.

In the case of acute frontal sinusitis, palpation of the frontal sinus is useful because the frontal sinus often produces a periostitis that is significant. Percussion over the sinus may give evidence of exquisite tenderness; a simple test in which the patient is asked to jump and land flat on his feet is most effective in identifying a frontal sinus that contains pus.

Mouth

Examination of the mouth begins with a complete survey of the teeth. A tongue blade should be used to retract both lips and tongue so that the teeth, oral mucosa, and gingivae can be visualized and studied. All removable dental appliances must be removed before examining the mouth lest they cover a lesion and hide it from view.

Tongue

Mobility of the tongue should be demonstrated at the outset by testing for motion of the tip of the tongue from right to left and protrusion. The base of the tongue should be examined with the laryngeal mirror. This may be accomplished at the time of the examination of the larynx. The presence of lingual lymphoid tissue should be noted and recorded. If there is any suggestion of disease in this region, the base of the tongue should be palpated with the gloved finger. This procedure should be performed at the end of the examination so that the gag reflex will not be stimulated and satisfactory examination of the larynx will not be jeopardized.

The palate should be examined and a brief touch with the tongue blade will tell the examiner whether or not the palate moves symmetrically. It is not uncommon to find small papillomas on the free margin of the palate, near the base of the uvula, or on the uvula. These should be looked for and noted.

Tonsils

The fauces should be examined, the presence or absence of the tonsils should be noted, and the presence or absence of any masses in this area should be evaluated. Although asymmetry in position and size of tonsils is not rare, deviations from normal symmetry should be recorded as should the vascularization or injection of the vessels of the anterior tonsillar pillars. In posttonsillectomy patients there may be residual pieces of tonsil left in the fossa, but more commonly some lymphoid tissue is pulled into the fossa from the nearby tongue base by scarring. Such lymphoid tissue should not be described as residual tonsil unless it is clearly residual tonsillar tissue. It is better to describe it as lymphoid tissue and to define its location and extent.

Larynx

Examination of the larynx is accomplished in most patients without difficulty. If the patient is seated with feet squarely on the footrest and is asked to lean slightly forward and to tip the head back with the chin thrust forward and the tongue protruded, the tip of the tongue may be wrapped in a piece of gauze and held gently in position while the laryngeal mirror is passed over the base of the tongue to reflect light onto the larynx. If the patient is asked to pant gently while this is being done, the examination is facilitated. When the vocal cords are visualized, phonation at the request of the examiner who asks the patient to say "EEEEEEE" or "Ah, Ah, Ah" is usually sufficient for adequate visualization of the vocal cords, evaluation of the cord movement, and inspection of other laryngeal structures. If the epiglottis is deflected posteriorly and hides the glottic chink, it is sometimes possible to see the vocal cord movements while the patient is phonating "EEEEEEEEE". One should look for elevation of the epiglottis on phonation. If it is not possible to visualize the larynx, local anesthetic (5% lidocaine) will usually make this examination possible. It is sometimes possible to visualize the larynx if the angle of the examining chair is altered. If the chair is raised or lowered significantly, the angle at which the light from the head mirror is reflected into the larynx changes, and the visibility of the larynx may be greatly improved. Sometimes, simply readjusting the angle of the mirror slightly will make adequate visualization possible. If the patient's tendency to gag is a significant problem, it is helpful to use the same general technique as that used in otoscopy of the child's ear. With the first slight motion of gagging, release the tongue, and say, "That's fine. Let's just wait a minute". After short rest, try again with, "Now, let me take another look". Often, it is then perfectly easy to examine the larynx without upsetting the patient. If these maneuvers fail, the use of the fiberoptic laryngoscope is clearly indicated; using a topical anesthetic, passage of the fiberscope through the nose will usually result in a good examination of the larynx and permit study of the motions of the epiglottis and vocal cords on phonation.

Nasopharynx

The nasopharynx may be examined by three distinctly different methods. Using the small angulated postnasal mirror heated to the appropriate temperature, the physician depresses the tongue with a tongue depressor while the patient pants. A small mirror is inserted into the pharynx, below and slightly behind the soft palate. The physician should take care not to touch the posterior pharyngeal wall because this may stimulate the gag reflex and make examination by this route impossible. In most adult patients, it is possible to visualize

the vault of the nasopharynx, the posterior choanae, and, by rotating the mirror slightly, the fossae of Rosenmuller and the eustachian tube orifices. This gives a good overall view of the nasopharynx. More detailed study of this region must be made with the nasopharyngoscope or with the 90-degree telescope. In children, this is usually not possible, and the alternatives are to "mummy" the child and palpate the nasopharynx with the examining finger or to use the nasopharyngoscope. Although passing a cotton-tipped applicator bathed in a topical anesthetic along the floor of the nose usually provides adequate anesthesia for this examination, in the cooperative adult it is often possible to perform the examination without the use of an anesthetic. Using the nasopharyngoscope or the right-angled telescope causes "drag" on the nasal mucosa of the floor of the nose, which is uncomfortable. If a drop of lubricating jelly is applied under the tip of the telescope, this "drag" is eliminated and the examination of the adult may usually be accomplished without the use of additional topical anesthetics. The examiner must gently lift the tip of the nose and insert the nasopharyngeal telescope with great gentleness if this is to be accomplished with the patient's consent.

Examination of the nasopharynx is, or should be, a routine part of the ENT physical examination on all new patients. Hence, it should be done on all new patients on their initial visit. The added advantage to the young physician is that it takes a lot of practice to learn how to perform this examination quickly and gently. To learn the normal anatomy of this region takes a great deal of experience. It is for these reasons that every opportunity to examine the nasopharynx should be seized eagerly.

Temporomandibular joints must be examined in a dynamic situation. While the examiner is palpating the joints the patient is asked to open and close his mouth. The examiner palpates, watching for crepitus or snapping. Deviations of mandibular motion on opening or closing should be noted and the patient's teeth should be evaluated while the patient is opening and closing the mouth. Is the bite centric, do the teeth meet and then slide on biting, is the bite class 1, 2, or 3? These findings must be associated with the history to obtain a clear picture of the condition of the joints.

Neurologic examination

A brief but focused neurologic examination should be performed, beginning with the facial nerve and including an evaluation of all branches. The extraocular muscles should be tested and the patient should be tested for cerebellar signs by finger-nose testing and heel-to-shin, Romberg, and gait studies. It is desirable to look in the fundi for papilledema, although for definitive neurologic and ophthalmologic examination the patient should be referred to the appropriate specialists.