Staff Meeting Bulletin Hospitals of the » » » University of Minnesota

Carcinoma of Larynx

Volume XV | Friday, November 5, 1943 | Number 6

STAFF MEETING BULLETIN
HOSPITALS OF THE . . .
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Volume XV | Friday, November 5, 1943 | Number 6

INDEX

Published for the General Staff Meeting each week during the school year, October to June, inclusive.

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William A. O'Brien, M.D.

I. LAST WEEK

Date: October 29, 1943

Place: Recreation Room, Powell Hall

Time: 12:15 to 1:25 p.m.

Program: "Penicillin"
Wesley W. Spink

Discussion: Raymond N. Bieter
Irvine McQuarrie
Owen H. Wangensteen
Clarence Dennis

Attendance: 132

Alice Carlson,
Record Librarian

- - -

II. MEETINGS

1. ANATOMY SEMINAR

Saturday, November 6, 1943, 11:30 a.m., Room 226, Institute of Anatomy.

Leukemia in Man and Animals; chloroma and other human leukemias showing tumor formation.

Dorothy Reiff

Effect upon animals of extracts of urine from leukemia patients.

Robert Reiff

- - -

2. PATHOLOGY SEMINAR

Monday, November 8, 1943, 12:30 p.m., Room 104 Institute of Anatomy.

"Influenzal Meningitis"
H. D. Noster

- - -

3. PREVENTIVE MEDICINE AND PUBLIC HEALTH

Monday, November 8, 1943, 4:00 p.m., Room 116 Millard Hall.

"Incidence of Caries"
Allen Treloar

4. PHARMACOLOGY AND PHYSIOLOGY

Wednesday, November 10, 1943, 12:30 p.m., Room 105 Millard Hall.

"Kala Azar"
Gertrude Horn

- - -

III. ALUMNI HOMECOMING - FRIDAY - NOVEMBER 5, 1943

WELCOME: Graduates, Former Students, University of Minnesota medical and graduate schools.
WELCOME: Visiting Latin-American Professors of Public Health.

8:00 - 10:50 Surgical Clinic, West Operating Room--Department of Obstetrics and Gynecology.
John L. McKelvey and Staff.

8:00 - 9:50 Symptomatology of Rectal Diseases--Todd Amphitheatre--Department of Surgery.
W. A. Fansler.

8:30 - 9:50 Grand Rounds--Department of Podiatrics.
Irvine McQuarrie and Staff.

9:00 - 10:20 Grand Rounds--Department of Neurosurgery--
William T. Peyton and Staff.

9:00 - 9:50 Medical Case Presentations Todd Amphitheatre--Department of Medicine.
Cecil J. Watson and Staff.

11:30 - 11:45 Annual Business Meeting Minnesota Medical Alumni Association--Eustis Amphitheatre.

11:45 - 1:15 Hospital Staff Meeting Complimentary Luncheon--Powell Hall--Carcinoma of Larynx--
L. R. Boies

1:30 - 2:50 Neurology-Radiology Conference--Todd Amphitheatre--William T. Peyton, Leo G. Rigler, and Staff.

1:30 - 5:00 Surgical Clinic, Main Operating Room--Department of Surgery--Owen H. Wangensteen and Staff.

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IV. CARCINOMA OF LARYNX

W. R. Movius
L. R. Boies

Introduction

The purpose of this presentation is:
(1) To review the present state of knowledge regarding carcinoma of the larynx;
(2) To summarize our experience with surgical treatment of this malignant disease during the past 10 years on the Division of Otolaryngology and
(3) To point out to the general procession the means of improving the mortality rate from this disease.

Incidence

Carcinoma of the larynx, according to large statistical studies in the United States and England,[1] is increasing steadily, both actually and in relation to malignancy in other regions of the body. Among malignant diseases in general, laryngeal carcinoma stands about seventh. Wright[2] reports that 4 per cent of carcinomas occur in the larynx; the Jacksons[3] state that 1 per cent of deaths from malignancy in the United States are due to carcinoma of the larynx. In England the incidence of deaths from laryngeal carcinoma is 1.8 per cent of all deaths due to malignancies. The relative increase is about the same as that reported for primary carcinoma of the lung.[4]

The proportion of malignant to benign growths in the larynx is reported as 1 to 7. However, because benign growths are less frequently reported than malignant, the proportion would more likely be about 1 to 20.[5]

The age at which laryngeal carcinoma occurs most frequently parallels that of epitheliomata elsewhere in the body. Seventy per cent of cases occur between the ages of 40 and 70 years, according to the large series of the Jacksons.

Squamous cell carcinoma is said to constitute about 93 per cent of all malignant growths of the larynx. Adenocarcinoma, basal cell carcinoma, and sarcomata are relatively rare.

Etiology and Precancerous Lesions

Though the basic cause of malignancy is unknown there are a number of contributing causes of more or less minor importance.

1. Age is a factor. Most cases occur in patients over 40 years of age. Sex plays a role in carcinoma of the larynx. Men are said to be about 12 times more frequently affected than women. Alcohol and the irritation of tobacco smoke have long been held in minor suspicion as factors in chronic laryngeal irritation.

2. Precancerous lesions of acknowledged importance are pachydermia and leukoplakia. Jackson has stated that precancerous conditions are present in probably 75 to 80 per cent of the cases. "As a clinical fact we have rarely found cancer develop in a previously normal larynx." However, the belief that certain benign lesions are liable to become cancerous if not treated is not based on fact. For instance, one of the reasons given for removal of a papilloma of the larynx, in addition to the relief of hoarseness, is to prevent a malignant change. Observations on laryngeal papillomata establish the fact that malignant degeneration of these growths occurs infrequently. Jackson records 205 cases of papilloma of the larynx in adults in which carcinoma has developed at the same site in only 3 cases. He stated, "There is no evidence to show that removal of the benign growths had ever had any influence in the malignant developments." A case has been observed at the University of Minnesota Hospitals in which a papilloma was present in the patient's larynx for approximately 35 years.[6]

Classification

Malignant disease of the larynx is divided into 2 main groups: one, intrinsic carcinoma, in which the dis-

ease is limited to the interior of the larynx (the glottis); and a second type, extrinsic carcinoma, in which the tumor is located on the external surface of the larynx.

The location of the lesion is of paramount importance in determining whether or not the disease is amenable to treatment by surgery, and also the extent of the surgery that is necessary. The reason for this is that growths limited to the vocal cord proper may remain localized for a considerable period of time (months) while lesions involving the ventricular bands or the posterior part of the glottis reach lymphatic channels early in the development of the disease.

Symptoms and Signs

The one early symptom of intrinsic carcinoma of the larynx is a change in voice. This change occurs as a huskiness or hoarseness very early in the development of a tumor on the free margin of the true vocal cord.

Other symptoms may be:[7]

(1) An easy fatigue of the voice,
(2) An inability to clear the throat of "phlegm,"
(3) A sense of rawness or dryness or of irritation as from a foreign body.

The easy fatigue occurs in the course of development of an intrinsic carcinoma; the other symptoms are more common to the extrinsic growths. Dysphagia and stridor are late symptoms. The former indicates a lesion involving the posterior wall of the larynx (post-cricoid area); the latter occurs from encroachment on the glottis and suggests an intrinsic lesion. Pain from glandular involvement, especially earache (referred through the superior laryngeal branch of the vagus), is a late symptom.

The usual picture on inspection of the larynx is produced by localized edema with surface ulceration. When the lesion originates on the free margin of the cord, the earliest sign may be one of thickening. This goes on to ulceration within the swelling. Fixation of the true cord indicates a late stage in the disease. Persistent edema of the ventricular bands (false cords) or of an arytenoid prominence should arouse suspicion of an underlying malignancy. Lesions beginning below the level of the glottis (margins of the true cords) may be difficult to see early and are usually not detected until the true cord above has become involved.

Diagnosis

The clinical diagnosis of carcinoma of the larynx can usually be made by an inspection of the larynx with the simple laryngeal mirror. The direct view with a laryngoscope may be necessary to clinical diagnosis in certain cases, especially when an overhanging epiglottis obscures the glottis, or the lesion is subglottic, in the ventricle, or in the post-cricoid area. Direct laryngoscopy offers a satisfactory exposure for biopsy under direct vision. This provides the certain diagnosis, although it must be remembered that the surface projections of an epidermoid carcinoma sometimes show a papilloma-like projection which does not reveal malignant change.

The differential diagnosis considers 2 diseases which may simulate malignant lesions. These are tuberculosis and syphilis. These diseases are now less frequently encuntered than was the case two decades ago. The reasons for this should be obvious. The clinical characteristics of the triad are as follows:[8]

Tuberculosis	Carcinoma	Syphilis
Most common; decreasing	Common; increasing?	Primary and secondary rare. Tertiary common.
Ages 20 to 40.	Usually after 45.	After 45.
Sex about equal.	Much more common in males.	Males
Voice weak, hollow and painful.	Voice strong, rough and painless.	Voice hoarse and raucous.
Often associated with the general physical appearance of active pulmonary tuberculosis. Pulmonary disease is invariably present.	General sense of well-being in the earlier stages.	Same as in cancer.
Pallor of pharynx and larynx suggestive. Characteristically attacks the arytenoid and interarytenoid areas.	Intrinsic: Usually starts on free margin of cord; also on the ventricular band and in the ventricle. At first a thickening; progresses to a retraction or cupping in most prominent part of the swelling, then to ulceration and fixation of the cord.	Edema prominent. A dusky laryngeal congestion. In gummata, surface rounded, often irregular, deep red and purplish. When ulcerated it is deep, irregular, and punched out with crater-like, sharp edges and inflamed areola.
Ulcerations multiple, superficial, shallow and ill-defined.	May resemble a sessile tumor, as a benign fibroma, etc.	
"Tuberculosis nibbles"	Extrinsic: early, a dusky red, uniform swelling; later, ulceration.	"Syphilis bites"
Perichondritis common in advanced cases.		Perichondritis common.
Evolution slow.		Evolution rapid.

The planigraphic study of the larynx offers helpful information in showing the subglottic extent of the lesion.

Treatment

Opinion is almost unanimous that a surgical removal of the malignant lesion is necessary for a permanent cure. The cure is practically certain with lesions that originate on a vocal cord and have not extended beyond the confines of the laryngeal box.

The surgical attack may be one of three procedures:

(1) Laryngofissure (thyrotomy), with simple removal of one vocal cord.
(2) Hemi-laryngectomy---a wide destruction of as much of the interior of the larynx as seems necessary. A splitting of the larynx (laryngofissure or thyrotomy) provides the exposure.
(3) Total laryngectomy. Occasionally this is supplemented with a dissection of the neck glands.

A supplemental course of deep x-ray therapy is usually prescribed after hemi-laryngectomy or total laryngectomy.

The choice of treatment requires an individual evaluation of the case at hand. This evaluation considers:

(1) Location and extent of the tumor.
(2) The histopathologic grading of the tumor.
(3) The clinical evidence of metastasis.
(4) General condition of the patient.

The primary consideration in the selection of treatment must be the prospect of cure of an otherwise fatal disease, and secondarily, the preservation of a useful voice.

In general, simple laryngofissure is done only on those lesions which involve not more than the anterior two-thirds of 1 vocal cord, and in which there is no fixation of the cord. Occasionally, a case is encountered in which the lesion extends across the commissure and involves only a small portion of the anterior end of the opposite cord. This may still be suitable for a simple removal. The grade of the tumor will affect the extent of the operative procedure. New and Fletcher[9] have shown that there is an average extension of 5.5 mm. in all grades of malignancies from the apparent margin of the growth, but in grade 4, it may be as great as 15 mm.

The study of frozen tissue sections, taken after the larynx is opened and under direct visualization, aids the surgeon in determining the extent of his surgical attack.

The limits of hemi-laryngectomy may include a destruction of 1 side of the larynx and occasionally a considerable portion of the opposite side. One of the factors of: (1) location and extent, (2) grade of tumor, and (3) condition of the patient, may figure prominently in the decision as to extent of this surgical attack.

Total laryngectomy is usually indicated when there is fixation of a cord, or extensive involvement even in slow growing tumors, subglottic extension, and in most cases of rapidly growing tumors (grade 4). It is also indicated in all cases in which an extrinsic portion of the larynx is involved and a reasonable hope of cure is present.

We have no case of a cure of carcinoma of the larynx by the use of x-ray therapy and radium alone. It is, however, an important palliative procedure. Cases of cures have been reported.

The undifferentiated tumors show the most striking early result from irradiation but the rate of recurrence is high. The prognosis is more favorable in cases of the better differentiated, slower growing tumors. Tracheotomy frequently is necessary to relieve respiratory obstruction that develops during the course of therapy.

Advances in Surgical Technique and Post-operative Care

Important advances in surgical technique and postoperative care have been made in recent years.

A high surgical mortality was once experienced in total laryngectomy, apparently from pulmonary complications or the sepsis occurring in neck wounds. It was once considered safer to do all total laryngectomies in 2 stages: first a tracheotomy, and then a removal of the larynx about 2 weeks later. This preliminary tracheotomy was supposed to allow the trachea and bronchi to become "conditioned" so as to make them less likely to react acutely to the removal of the larynx and the opening up of the trachea. Ether anesthesia was usually the anesthetic of choice.

An extensive "T" incision was once considered necessary for adequate exposure in total laryngectomy. Retraction of the flaps, a greater liability toward a large pharyngeal fistula, and slower healing of the operative wound seemed favored by this incision.

Today, a one stage operation is popular. Local anesthesia alone or supplemented with a basal anesthetic such as avertin, and, more recently, intravenous pentothal, are the anesthetics of choice.

The midline incision favors early closure of the wound. Adequate exposure usually requires a splitting of the hyoid bone which is then usually removed. After exposure, the larynx is skeletonized, careful hemostasis is accomplished and then the larynx is separated from the trachea and removed from below upward. During this procedure, the trachea has been protected by an inserting into its opening of a fitted tube. The pharyngeal stoma is carefully closed with a double layer of chromic catgut. The tracheal stump is anchored into the lower end of the wound, using silkworm gut. After sprinkling the operative wound with sulfanilamide powder and placing Penrose drains up to the pharyngeal closure, subcutaneous closure is made and the skin edges approximated tightly with clips except for the small midline opening for drainage tubes. The tracheal cannula is placed and the wound covered with a pressure dressing.

In simple laryngofissure and in hemi-laryngectomy the thyroid cartilage is split in the midline with a motor driven circular saw. When an extensive area of tissue removal is necessary in a hemi-laryngectomh, the thyroid lamina on the involved side is also removed to facilitate this wide excision around the lesion.

Postoperative fluid and food intake is measured through the feeding tube. Secretions are aspirated by suction from the tracheal cannula. The patient is kept in warm moist air; a moderate dosage of sulfathiazole or sulfadiazine, started 2 days before surgery, is continued at least during the first postoperative week.

An ideal convalescence, and one that is occurring more frequently under present methods of management, finds the patient temperature free on the fourth or fifth postoperative day and allowed to sit out of bed by the end of the first week. If the pharyngeal wound has healed by first intention the clips are removed in one week and the feeding tube by the tenth postoperative day.

These statements apply to cases of total laryngectomy. In the cases of laryngo-fissure or hemi-laryngectomy, a tracheotomy tube and a feeding tube are placed at the end of the operation, and usually both can be safely removed by the second or third postoperative day unless the operation has been unusually extensive and involves the arytenoid area, which forms a portion of the party wall between the lumen of the larynx and the pharyngeal opening into the esophagus.

Voice Production after Surgery

In laryngofissure or hemi-laryngectomy one healthy vocal cord or a major portion of one healthy cord is left. When healing is complete a shelf of scar tissue replaces the area destroyed. A useful voice ordinarily can be produced by the action of the remaining cord against the scar.

When the larynx has been completely removed, voice production depends upon the use of a mechanical artificial larynx of the development of esophageal speech.

Some use the artificial larynx easily and develop facility in its use. Others are inclined to use it but little, and then half-heartedly.

Esophageal speech depends upon the swallowing of air which is then "burped" out past the constriction which has formed in the lower pharynx, after the larynx has been removed. The lips and buccal cavity modulate this sound into words. Some patients develop this speech readily and talk very distinctly. Recently, preoperative practice in burping after swallowing charged water has seemed to facilitate the development of this ability.[10]

Case Reports

The following case reports illustrate the types of surgery referred to:

1. ., age 59 years, was admitted to the Division of Otolaryngology on 9-3-35. His only symptom was a hoarseness of 2 months' duration. He had consulted his family doctor who recognized the possibilities of this symptom and referred the patient to a laryngologist. Mirror examination revealed a small swelling with surface ulceration in the central portion of the right vocal cord, which was freely movable. Biopsy revealed that the growth was a squamous cell carcinoma, grade 2.

Laryngofissure was performed and the lesion excised in a block of tissue extending a centimeter beyond the apparent margins of the growth. Convalescence was uneventful. The patient now has an 8 year cure. He has a husky but useful voice.

2. , age 76, was admitted to the Division of Otolaryngology on 7-27-36. His only symptom was hoarseness of several months' duration. Examination with a laryngeal mirror revealed swelling and ulceration of the right vocal cord with extension across the commissure on to the left cord. The right cord seemed to be fairly well fixed.

General physical examination revealed an elderly man in fair state of health. The positive findings were: moist rales at the base of the right lung, a moderate hypertension, and arteriosclerosis. It was estimated that he would be only a fair risk for laryngeal surgery. Because of this fact, a two-stage procedure was planned. Tracheotomy was done and a biopsy from the right vocal cord was obtained. This revealed a squamous cell carcinoma, grade 3.

The larynx was opened 9 days after the tracheotomy. All of the right vocal cord and the right thyroid lamina were removed. The anterior one-half of the left cord was destroyed by surgical diathermy.

Convalescence was slow. The feeding tube could not be removed until the 20th postoperative day. The tracheotomy tube was not removed until about a month later.

This patient has had no recurrence of his cancer and is in fair health at the age of 83 years. He has a weak but an audible voice. There is considerable air waste when he attempts to phonate. This is due to the nature of his operation.

3. , age 41, was admitted to the Division of Otolaryngology on 8-2-35. He had been hoarse for 1½ years and short of breath for 3 weeks. He had lost 20 lbs. in the past 6 months. Examination of the larynx with the laryngeal mirror revealed an ulceration involving the left true and false cord and extending on to the arytenoid prominence. It encroached upon the lumen of the larynx so as to produce a moderate stridor. His general condition seemed to be good except for a chronic bronchitis. Biopsy of the lesion revealed it to be a squamous cell carcinoma, grade 3. Tracheotomy was performed on 8-2-35, and the larynx was removed on 8-19-35 under local anesthesia. Convalescence was slow but uneventful. Supplemental x-ray therapy was given.

The patient is well 8 years after this treatment. He can produce a good voice with an artificial larynx.

A Summary of the Surgical Experience with Carcinoma of the Larynx for a 10-year Period at the University of Minnesota Hospitals (Division of Otolaryngology).

In a 10-year period preceding Sept. 1, 1943, 40 cases of laryngeal carcinoma have received surgical treatment designed to cure the disease. A larger group has been given palliative treatment in the form of x-ray therapy, implantation of needles, tracheotomy for the prevention or relief of respiratory obstruction, etc.

This review is limited to the cases receiving major laryngeal surgical treatment. There is no instance of a cure of laryngeal carcinoma here in this period by the use of x-ray and radium alone.

Because of the relatively small size of the group of cases under discussion, a detailed statistical breakdown is not made. The items of significant interest are as follows:

Ages

38 years	1
40-44	5
45-49	2
50-54	6
55-59	4
60-64	10
65-69	4
70-74	3
75-79	4
84 yrs.	1
Total	40

Sex --- All Males.

Type of Surgical Treatment

Total laryngectomy	21
Laryngofissure or Hemi-laryngectomy	19

Type of Lesion

Intrinsic	34
Extrinsic	6
Operative Mortality	2

Two "surgical" deaths occurred in this group. One 60 year old patient had hiccoughs which were not controlled and died 1 week after a 2-stage total laryngectomy. The autopsy revealed no definite cause for death. The other, a 75 yr. old patient, died of broncho-pneumonia on the fifth day after a partial laryngectomy.

Year	No. of Cases	End Results: Living and Well	
1933	2	1?	1 died of recurrence in 2½ yrs. The other not traced. Known to be living and well at end of 3 years.
1934	1	0	Died of recurrence 15 months later.
1935	8	4 & 1?	1 "surgical" death. 1 died of recurrence within the same year. 1 not traced after 2 years. 1 died of heart disease 8 yrs. later.
1936	5	2	1 died in a mental hosp. 2 yrs. later; 1 died in 3 yrs. of metastases; 1 died 6 yrs. later. Cause---?
1937	2	2	____
1938	1	1	____
1939	3	1 & 1?	1 "surgical" death. 1 not traced. Was living and well 3 yrs. later.
1940	3	2	1 died 1½ yrs later--cause unknown.
1941	6	6	____
1942	2	1	1 died from acute alcoholism 2 months after operation.
1943	8	8	____

Comment

A study of these end results reveals the fact that carcinoma of the larynx is curable and that for this cure a proper selection of cases is necessary. It is our experience, however, that for every case in which surgery offers a reasonable hope of permanent cure, one or two cases have to be given only palliative treatment. The question is pertinent, therefore, "What chance for a cure has one who is going to develop a carcinoma of the larynx?" In the present state of our knowledge there is only one answer and that concerns the matter of early diagnosis. We have decided that early diagnosis and the chance of permanent cure with a minimal amount of surgery will only be realized when the medical student is taught to suspect carcinoma of the larynx when a patient has laryngeal symptoms, and then to use the simple laryngeal mirror.

Summary

1. A series of 40 cases of laryngeal cancer have received major surgical treatment on the Division of Otolaryngology in a 10-year period preceding September 1, 1943.

2. All were males ranging in age from 38 years to 85 years--one-half were between 50 and 65 years of age.

3. 34 of these cases were intrinsic growths and 6 were extrinsic.

4. The advances in surgical technique and postoperative care have markedly lowered the surgical mortality.

5. Two surgical deaths occurred in this group.

6. A study of the end results in this group definitely reveals the curability of carcinoma of the larynx.

7. Practical speech following laryngeal surgery is a reality.

8. The early diagnosis and the most permanent cure with a minimal amount of surgery will only be realized when the medical student, and hence the general profession, are taught to suspect carcinoma of the larynx when a patient has laryngeal symptoms and then to use the simple laryngeal mirror.

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V. GOSSIP

University of Minnesota is host today to former students and graduates of the medical and graduate schools. This day, each year, is devoted to honoring all who have gone forth from this institution to create for themselves a place in the medical world. Minnesota men and women everywhere are proud of their place of origin. Even though we are scattered in various parts of the world our thoughts today are of one another and our school. Recent reports of national rating groups indicate that the caliber of undergraduate students at the University of Minnesota is second to none. The Army, Navy and Public Health Services consistently praise services rendered by Minnesota men and women. In our fight to preserve our way of medicine we must not lose sight of the fact that under our system of developing men and women in this school great progress has been made. Let us hope at the end of the hostilities that medical education will again be given into the hands of those who would develop it into still a greater culture....Visiting Latin American professors of Public Health are also guests of the University today. A special program has been arranged for them. The following topics are included: public health training at the University of Minnesota, training of public health nurses, training of public health engineers, postgraduate public health education, tuberculosis control, biostatistics laboratory, Minnesota state sanitary conference proceedings, management of poliomyelitis, experimental developments in nutrition, care of students' health, and a special lecture on Development of Public Health, by Dr. Haven Emerson, visiting professorial lecturer, University of Minnesota and Professor Emeritus of Public Health Practice, Columbia University. Staff members taking part in the program are: Diehl, Freeman, Whittaker, O'Brien, Myers, Treloar, Chesley, Knapp, Keys, and Boynton. There will be a special tour of the State Department of Health Laboratories, Saturday, November 6. Minnesota is favorably known for its health department activities, special control programs for various diseases and groups, training of public health nurses, and more recently the training of public health physicians and engineers. Interest in public health will grow as more physicians in service are brought into immediate contact with the program. The public health dollar still goes farther than the curative dollar. It remains to be seen whether our thinking in the post war world will carry us to logical conclusions in the expenditures of public funds for improvement of the health of the people. Achievements of curative medicine, important as they are, are insignificant when compared with achievements of preventive medicine.....On Tuesday of this week to speak to the American Red Cross rally for Nurses Aides of Minneapolis, Medical Wives. Mariette and Wangensteen are leaders in this movement. Medical profession and hospitals owe much to these two fine workers. To stirring music, hundreds of uniformed lay persons march into the auditorium, each group headed by a banner, like an academic procession. Largest groups come from University of Minnesota hospitals and Minneapolis General Hospital. Capping, service stripe awards and special distinctions for more than 1,000 hours service are on the program. The speakers vie with one another in thanking these good women for services well done. It was pointed out that every group of 8 made possible 1 nurse overseas, that hospitals could not carry on today without them and that more would be expected of them in the future. Few of us appreciate the sacrifices which these women make, in order to perform this extra service. In each instance the Nurses Aide has a stake in the war effort in the form of a husband, brother, son, or sweetheart, and in many instances a daughter as well. The movement did not look too promising in the beginning but now all hospital authorities agree that next to the service of the war nurse the contribution of these aides and the Grey Ladies is the most important contribution of women in the war effort....On Wednesday of this week to speak to the young men and women who edit our high school papers in Minneapolis to tell of the importance of greater effort in tuberculosis control....On Thursday to converse with the good ladies of the Zonta club and on the same evening to enjoy my annual visit with the students of St. Olaf College at Northfield. My host is Doc Cook, brother of the late Doc Cook of our staff.....

VI.

RADIO SCHEDULE
November - 1943

William A. O'Brien, M.D.
Director, Postgraduate
Medical Education;
Professor, Preventive
Medicine & Public Health,
University of Minnesota

DATE	TIME	STATION	SUBJECT	SPONSOR
3	11:00 a.m.	WLB	Care of Skin and Hair	(2)
6	9:15 a.m.	WCCO	Chest Surgery - General Principles	(1)
6	11:00 a.m.	WLB	Medicine in the News	(1)
10	11:00 a.m.	WLB	Common Skin Diseases	(2)
13	9:15 a.m.	WCCO	Chest Injuries-Surgical Treatment	(1)
13	11:00 a.m.	WLB	Medicine in the News	(1)
17	11:00 a.m.	WLB	Clothing and Health	(2)
20	9:15 a.m.	WCCO	Chest Diseases-Surgical Treatment	(1)
20	11:00 a.m.	WLB	Medicine in the News	(1)
24	11:00 a.m.	WLB	Good Air	(2)
27	9:15 a.m.	WCCO	Dental Economics	(4)
27	11:00 a.m.	WLB	Medicine in the News	(1)
29	4:30 p.m.	WCCO	Your Hospital in War-Time - The Patient	(3)

SPONSOR

(1) Minnesota State Medical Association

(2) University of Minnesota School of the Air

(3) Minnesota Hospital Association

(4) Minnesota State Dental Association