

Bulletin of the
University of Minnesota Hospitals
 and
Minnesota Medical Foundation



**Upper Respiratory
 Malignancy**

BULLETIN OF THE
UNIVERSITY OF MINNESOTA HOSPITALS
and
MINNESOTA MEDICAL FOUNDATION

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INDEX

	<u>PAGE</u>
I. ADVANCED MALIGNANCY OF THE UPPER RESPIRATORY REGION	100 - 105
JEROME A. HILGER, M.D., Clinical Associate Professor,	
BRADLEY W. KUSSKE, M.D., Medical Fellow,	
Division of Otolaryngology,	
University of Minnesota Medical School	
II. MEDICAL SCHOOL NEWS	106 - 107
III. WEEKLY CALENDAR OF EVENTS	108 - 113

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I. ADVANCED MALIGNANCY OF THE UPPER RESPIRATORY REGION

Jerome A. Hilger, M.D.
Bradley W. Kusske, M.D.

Criticism can intelligently be levelled at ridiculously late diagnosis resulting from piddling treatment with early extrusion of the malignancy from the sinus -- a condition indicative of advanced stage.

INTRODUCTION

Palatal Type

A. CARCINOMA OF THE MAXILLA

The Palatal Type
The Infero-Medial Type
The Infero-Lateral Type
The Supero-Medial Type
The Supero-Lateral Type
The Usual (Too Frequent) Type
The Therapeutic Approach
Lymphatic Extension

Carcinoma originating on the palatal aspect of the maxilla is susceptible to early diagnosis. Only lack of intelligence or willfull neglect on the patient's part will keep him from seeking dental or medical advice for the tumefaction or ulceration. Resection of the inferior half of the maxilla including the alveolar process and indicated mid-line or contralateral margin of safety allows maximum opportunity for cure without sacrifice of the orbit when extension has not reached that absurd limit.

B. CARCINOMA OF THE LARYNX AND LARYNGOPHARYNX

1. True Cordal Carcinoma
 - a) Therapy
2. Laryngopharyngeal (Respiratory and Transitional Mucosal) Carcinoma
 - b) Therapy

Infero-medial Type

The inferomedial tumor by early involvement of the partition between sinus and nose may cause smooth tumefaction in the anterior and inferior nasal space through medial displacement of the inferior turbinate. This tumor may also erode the palatal bone and present as a submucous swelling of the palate. It usually has filled the maxillary sinus before it presents in either position and hence adequate resection through removal of the inferior half of the maxilla with preservation of the orbital floor is the exception and not the rule. In approaching the lesion through a high anterior entrance into the sinus cavity immediately beneath the infra-orbital rim is permissible to define its limits in this regard. Too frequently the superior limit of involvement indicates the need for en bloc orbital resection.

C. CERVICAL ESOPHAGEAL CARCINOMA

D. GENERAL OBSERVATIONS

Changes in therapeutic philosophy toward certain advanced malignancies of the upper respiratory tract and cervical esophagus have evolved in the past decade and warrant general awareness.

A. CARCINOMA OF THE MAXILLA

Carcinoma may primarily involve the oral (Palatal) aspect of the maxilla or it may originate within the maxillary sinus. The latter are usefully divided by Ohngren into the infero-medial, the infero-lateral, the supero-medial and the supero-lateral according to the initial position of the tumor. Unfortunately like so much of visceral carcinoma that in the maxillary sinus gives few consistent early symptoms and late diagnosis is the rule and not the exception. Present diagnostic methods offer little improvement in early diagnosis. Wishful thinking or trite early diagnosis exhortation has little influence on this fact.

The Infero-Lateral Type

Infero-lateral sinus carcinoma tends to present as an extruding submucous mass beneath the canine fossa mucosa. Low grade secondary infection in the neoplastic mass sometimes gives inflammatory signs and moderate palpation tenderness which on unintelligent occasion encourages incision and drainage of the swell-

ing. Serosanguinous material obtained has too frequently encouraged persistence in this course which says little for the medical intellect involved.

This area of origination involves the apices of the teeth and dental complaints and localized dental x-ray findings not uncommonly result in extractions which do not heal. The dental profession is being well educated in the matter of carcinoma suspicion and at this juncture if not earlier biopsy identification is usually requested. These lesions even less commonly than those of the infero-medial group are amenable to partial resection.

Complete maxillectomy and orbital resection is required as a rule because of roof involvement prior to extrusion from the canine area. An additional precaution must be taken surgically because the latter involves the facial periosteal surface and sometimes additional anterior soft parts with consequent widening of the lymphatic potential to the preauricular or mandibular marginal nodes.

The Supero-Medial Type

The supero-medial carcinoma of the maxillary sinus originates in the region of the natural ostium into the middle meatus. This natural orifice encourages early extension into the ethmoid air cells. The latter can contain a surprising amount of carcinoma before nasal obstructive or bleeding signs develop. For this reason the supero-medial type is often and quite properly called maxillo-ethmoidal carcinoma. Involvement of the last recesses of the posterior ethmoid block relates the carcinoma to the sphenoidal components of the anterior cranial fossa floor and makes wide margin block resection impossible. The floor of the orbit and its medial wall--the lamina papyracea-- are always involved and en bloc resection of the orbit and its contents is imperative. The infra-orbital sulcus carrying the artery and nerve of that name from the posterior pterygoid space to the anterior cheek is subperiosteal in the back of the orbit and often submucosal in the anterior

maxillary sinus. It is the natural and easy route of carcinoma extension and can transmit carcinoma backward into the pterygoid and temporal space with minimal narrowing of the palpebral aperture and no diplopia in the early phase. Extension by this route to and along the second division of the fifth cranial nerve to its issuance from the round window is another frequent stumbling block to clean wide margin resection-- second only to sphenoidal contamination in this supero-medial group.

The Supero-Lateral Type

The supero-lateral type by original proximity involves and destroys the malar bone and the lateral infraorbital margin early. Infiltration of the orbital floor produces a narrowing of the palpebral aperture and a firm rim of tumefaction deep in the floor of the orbit which can be found with an inquiring finger. The thin bone posterior to the heavy infraorbital rim and the aforementioned infraorbital sulcus make for this extension. A fullness of the supratemporal space laterally (commonly expressed as an unnoticed crease from the auricular bow of the patient's spectacles) indicates the extension from the infra-orbital sulcus is now far back along the lateral sphenoid wing beneath the malar arch. Adequate films of the round foramen can warn of unresectable extension to the through the skull base in such instances. There is merit in obtaining this information prior to removal of the maxilla and the orbital contents. Palpation of the lateral nasopharyngeal space is another useful feature of the preoperative analysis. When tumor crowds the blind pterygoid and temporal space it has a way of bulging medialward and downward toward the palate that makes palpation more informative than inspection.

The Usual (Too-frequent) Type

The late features of all of the above combine in the usual maxillary carcinoma as it approaches clinical definition and decision. Honesty-- not defeatism-- leads one to suspect that the early small lesion in the secretive sinus space awaits a diagnostic technique not now available

to detect its presence. This focuses clinical ire more sharply on the stupidly late diagnosis. A simple cardinal rule can minimize the latter. Swellings of the external aspect of the maxilla should be viewed as evidence of destructive-- usually malignant-- disease. They do not result from extension of intra-sinus infection. Like all generalizing precepts in medicine, this rule is not universally true, but its simplicity recommends it and where it errs the embarrassment will not be mortal.

The Therapeutic Approach

Three therapeutic methods--separate or in conjunction-- have been used. Coagulation destruction, radiation therapy, and surgery. Evolution through five decades demonstrated the best results were obtained by a judicious combination of the three. The commonest method evolved into a surgical approach to the tumor occupied space, coagulation-- destruction of a variable part of the mass and insertion of radium elements into the cavity thus created.

This sequence was commonly preceded or followed by deep x-ray therapy. The philosophy supporting this approach denied the total resectability of a mass so intimately associated with the base of the skull and adjoining vital structures. The morbidity associated with this treatment method was formidable. The convalescence-- with frequent osteitis and sequestration--- was long. The virtue of retaining a seeing eye and the orbital contents was doubtful since adequate radiation commonly destroyed function and often left a painful eye as well as a useless one. The coagulation destruction of the main mass was a peculiarly unsatisfying surgical experience since there was no pretension to thorough removal. When to quit burning in the blind and bloody hold was a definition requiring a divine sense rather than a surgical one.

Here and elsewhere in the last eight years efforts have been made toward a clean en bloc resection of the tumor and a reasonably wide margin of normal en-

virons. For the less frequent tumors of limited extent this poses no problem. For the usual tumor or wide involvement a total philosophy must prevail. The removal of the maxilla and the orbital contents in a single unviolated block is feasible. Experience has taught the wisdom of including the ethmoid capsule and the pterygoid process with the block. The ethmoid cells adjoining the maxillary ostium can be invaded without preoperative detection. The pterygo-maxillary space is too close to the continuing influences of the infraorbital sulcus to serve as a good resection line. Resection exposes the foramina of the anterior aspect of the middle fossa from the optic foramen to the mandibular foramen. If tumor extension reaches this skull base, the area is readily pinpointed, destroyed with cautery, and exposed to accurate focalized radiation therapy. The en bloc removal is effected after reflection of a flap comprising the skin and superficial facial musculature. The incision is carried from the midline of the upper lip to the midpoint of the nasal base, thence around the nasal sulcus to the inner canthus, along the free margins of the lids to the outer canthus and thence along the malar eminence. The flap thus reflected is placed back over the cavity defect, the lids approximated and the incision line closed. An upper denture constructed with a hollow acrylic box fills the cavity defect and makes postoperative and future inspection easy. An opaque lens in the spectacles appears better than orbital plasty with prosthesis or synthetic overlay with a staring eye.

Lymphatic Extension

Wide extension of maxillary carcinoma is rare. It is effected via the lymphatic system. The metaplastic squamous cell carcinoma is the usual tumor. Spread by way of the lymphatics from the sinus mucosa should be through the retropharyngeal route to the high lateral pharyngeal nodes. This would place metastatic extension beyond the reach of the usual neck dissection. This involvement is rarely seen clinically unless it is being overlooked as such and termed a persistence of the primary at the skull

base.

Extension of the primary to the oral mucosa or anterior facial soft parts reaches the lymphatic bed draining through the mandibular nodes to the deep cervical chain. This lymphatic path is resectable with the usual neck dissection.

Initial resection of the lymph bearing structures of the neck with the primary is not a routine procedure because of the unknowns expressed above. In clinical fact malignancy originating within the sinus cavity is slow to metastasize and for a very long time in the usual case it remains a gross local tumefaction. Most deaths occur eventually from extension of the primary to the intracranium--- not from metastatic involvements. Neck dissection is reserved for the case with palpably significant nodes.

B. CARCINOMA OF THE LARYNX AND LARYNGOPHARYNX

Carcinoma of the laryngeal region has been divided and subdivided in a most complex and confusing manner. The whole head and sub-head mess might well be thrown out were it not for the fact that essential differences in therapy and results are predicated upon the precise point of origin of the tumor. Time, progress, and clearer thinking have evolved a simple and useful division. From the standpoint of malignant potential (grade, lymphatic extension, therapeutic method, and curability) the lesion originating from the squamous epithelium of the true vocal cord differs from that arising by metaplastic change from the respiratory epithelium of the subcordal or supracordal structures and the transitional epithelia of the laryngo-pharyngeal area.

True Cordal (Vocal Cord) Carcinoma

True cordal carcinoma gives outstanding hoarseness early in the disease. It remains localized to the vocal cord for a long time. The bed of the cord is poor in lymphatics. This is a cutaneous carcinoma in a visceral location. It is one of the few visceral carcinomas to

give early symptoms. Exhortation regarding early diagnosis has a place here.

Therapy

Curability of a lesion of less than vocal cord extent which has not infiltrated the cord musculature is in the region of ninety percent with the proper surgical procedure correctly performed. In certain ideal clinical situations attempt is being made to obtain this figure with radiation therapy for this highly selected lesion. Until results of these studies under optimum conditions are in the general approach to these early cases should be surgical. It is unfair to imperil the radiation future of the lesion by an illconceived and poorly conducted "squirt and spray" attack.

Lesions of the true cord which have infiltrated the underlying musculature or the cricoarytenoid joint with limitation of cordal motion, or involved both sides of the larynx are surgical problems to be resolved by hemi-laryngectomy with primary skin graft or total laryngectomy as the case may indicate. The inadequate subperichondrial laryngectomy has been replaced by the wide field technique. Skeletonizing the tumor, the accepted method of yesterday, is hardly compatible with the surgical philosophy of malignancy. In leaving the anterior musculature and perichondrium one also left the first anterior lymphatic barrier. Curability with adequate excision approximates sixty five percent and function is restored with esophageal voice training when total excision is indicated. Radiation therapy for this type of lesion is at a distinct disadvantage. Tumor infiltration so closely approximates the cartilaginous framework that severe perichondritis is the rule. The morbidity is severe and the mortality due to pulmonary complications in the age group is significant. Radiation curability does not compare favorably with surgical curability--- in most series the results are less satisfactory by half.

Laryngopharyngeal (Respiratory and Transitional Mucosal) Carcinoma

Carcinoma arising from the respiratory

or transitional mucosal area of the laryngopharynx has been variously termed for the anatomic point of origin subglottic, ventricular, aryepiglottic, epiglottic, post-cricoid, lateral pharyngeal or posterior pharyngeal. Malignancy of those areas tends to be of higher grade, to spread earlier through a rich lymphatic bed to regional cervical nodes, to be over-all less curable than carcinoma of the true vocal cord. Diagnosis of these lesions is usually made late, often when large cervical lymph node extension of the neck becomes obvious. Visceral symptoms are scant. In subglottic lesions wheeze or cough may be first symptoms but denote an advanced tumor. Pharyngeal discomfort usually indicates an already gross pharyngeal tumor.

Therapy

Radiation curability of these lesions is exceedingly low. To the hazardous proximity of the cartilaginous framework is added the early involvement of cervical lymph nodes--a condition not commonly controlled by irradiation.

The misfortune of inadequate surgery has been visited on these lesions for decades. A better philosophy now prevails. It was initiated by present awareness that one third of these lesions have palpable cervical node metastasis at initial examination. In the remaining two-thirds routine neck dissection will demonstrate microscopic or palpable node involvement in one half. This knowledge has dictated the necessity of performing a routine homolateral neck dissection en bloc with the primary excision. Primary closure of the pharynx is usually feasible. When it is not, pharyngostomy is created by suture of the residual mucosa to the neck skin. Later pharyngeal reconstruction with cervical skin flaps is not difficult.

Subglottic tumors may extend through lymph vessels intimately associated with the thyroid gland. In addition to the anterior strap muscles, therefore, the thyroid isthmus and homolateral lobe should be removed with the neck dissection mass.

In projecting adequate primary surgery for these difficult laryngopharyngeal lesions the picture of the unresolved case should be born in mind. A more pitiful figure is hard to imagine than the painfully dysphagic and laryngeally obstructed individual who must suffer out his remaining days with a gastrostomy and tracheostomy meanwhile plagued with recurrent aspiration pneumonia. The initial approach must be of a scope and adequacy to give the patient his best chance. Frittering this opportunity away by partial procedures in unfinished sequence is inadmissible.

C. CERVICAL ESOPHAGEAL CARCINOMA

Closely akin to the sequence of obstructive dysphagia and respiration of the laryngopharyngeal carcinoma patient is that of the patient with cervical esophageal carcinoma. Dysphagia is the common first symptom--however, it does not occur in the early period of the tumor. It has now been well demonstrated that this tumor fortunately does not characteristically disseminate widely. Most patients who die of the disease die of inanition with the tumor still confined to the area of origin or the cervical lymphatics. Until this was well understood radiation therapy, esophageal dilatation, gastrostomy and often eventual tracheostomy was the sequence preceding the almost inevitable fatal outcome.

Resection of the cervical esophagus leaves a void in the food passage which has been a deterrent to surgery. It is now overcome in one of three ways. A combined abdomino-thoracic and cervical procedure has been utilized to bring the lower esophagus and stomach upward to a high cervical anastomosis. The technique is feasible though formidable and a functional result can be obtained. In other hands the resected cervical segment has been replaced by a tantalum and fascia lata tube which gives a scaffold for epithelialization of a cicatricial tube. The result leaves much to be desired. One suspects incessant dilatation is a necessary aftermath more often than not. The third alternative has proved most satisfactory and least morbid here. The

esophagus below the resected segment is brought to the skin at the base of the neck and the pharyngo-esophageal mucosa above is in turn sutured to its regional cervical skin. The larynx can frequently be retained if the postcricoid area is not involved by upward carcinoma extension. The homolateral vocal cord is usually paretic as a consequence of removal of the recurrent laryngeal nerve with the homolateral thyroid lobe, the resected primary segment and the neck dissection mass en bloc. The cervical skin between pharyngostomy and esophagostomy gradually assumes a trough-like character as visceral tugging rolls it back beneath the retained larynx and trachea. Closure of the trough to adequate tube dimensions is then satisfactorily effected after several months through utilization of cervical skin flaps.

It is noteworthy that there is more pulmonary morbidity through aspiration whenever adequate resection permits retention of the larynx as a communication between pharynx and lower airway. Damping of aspiration materials can be effectively done by fashioning an inflatable cuff on the tracheotomy tube which is always placed for the post-operative and convalescent period. When it is in place and inflated, aspiration through the relatively insensitive aged larynx does not reach the lower respiratory tract.

D. GENERAL OBSERVATIONS

Many factors have contributed to the changing philosophy of therapy for these tumors. The principal factors:

1) the anxiety to accomplish more for the patient in lieu of inadequate radiation therapy results of the past many decades;

2) the impression that where radiation can be focalized on a small surgical residuum of tumor better results can be expected from it;

3) the reasonable expectancy that post-operative sepsis can be controlled through use of newer agents;

4) the ready availability of blood replacement;

5) indispensable advances in anesthesiology;

6) better understanding of the formidable barrier to systemic extension inherent in the magnificent cervical lymphatic filter;

7) better post-operative physiologic and nutritional management;

8) more intelligent pre-operative estimation of resectability, and

9) more competent surgical teams.

II. MEDICAL SCHOOL NEWS

Coming Events

December 3 - 5 Continuation Course in Obstetrics for General Physicians
January 7 - 9 Continuation Course in Pediatrics for General Physicians
January 25 - 30 Continuation Course in Neurology for General Physicians and Specialists

* * *

Faculty News

Dr. Gaylord Anderson, Professor and Director, School of Public Health, attended the recent meeting of the American Public Health Association in New York City. Dr. Herman Hilleboe, University of Minnesota graduate, was named President-Elect of the Association, and Dr. Alan E. Treloar, Professor of Biostatistics, was named Chairman of the Vital Statistics Section.

Dr. David Glick, Professor of Physiological Chemistry, presented a paper on "Quantitative Microchemical Analysis in Histochemistry" at a symposium on histochemical methods sponsored by the Pathology Study Section of the National Institutes of Health at the Armed Forces Institute of Pathology, Washington, D. C., on October 2. As a participant in a Symposium on Immunity and Hypersensitivity sponsored by M & R Laboratories at Stanford University Medical School on October 31, he presented a paper on "Hyaluronidase Inhibitor and Heparin Changes in Human Blood Serum." He also presented the Henry A. Mattill Memorial Lecture at the State University of Iowa on November 16 on "Current Trends in Quantitative Microanalysis of Cells."

On November 1 and 2, Dr. Ancel Keys, Professor and Director, Laboratory of Physiological Hygiene, attended the meeting of the American Society Study of Arteriosclerosis, in Chicago. From there he went to Washington, D. C., where he attended the meetings of the National Research Council on Food and Nutrition on November 6 and 7. Dr. Keys also presented a lecture on "Incidence of Heart Disease" at Vanderbilt University, Nashville, Tennessee, sponsored by the Tennessee Heart Association, on November 18. On December 12 he will lecture on the occasion of the dedication of new buildings at the University of Buffalo Medical School, Buffalo, New York.

* * *

Publications of the Medical School Faculty

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III.

UNIVERSITY OF MINNESOTA MEDICAL SCHOOL
WEEKLY CALENDAR OF EVENTS

Physicians Welcome

November 23 - 28, 1953

Monday, November 23

Medical School and University Hospitals

- 9:00 - 9:50 Roentgenology-Medicine Conference; L. G. Rigler, C. J. Watson and Staff; Todd Amphitheater, U. H.
- 9:00 - 10:50 Obstetrics and Gynecology Conference; J. L. McKelvey and Staff; W-612, U. H.
- 10:00 - 12:00 Neurology Rounds; A. B. Baker and Staff; Station 50, U. H.
- 11:30 - Tumor Conference; Doctors Kremen, Moore, and Stenstrom; Todd Amphitheater, U. H.
- 11:30 - 12:30 Physical Medicine Seminar; Swelling of the Lower Extremities; D. A. Felder; Heart Hospital Auditorium.
- 12:15 - Obstetrics and Gynecology Journal Club; Staff Dining Room, U. H.
- 12:30 - 1:30 Physiology Seminar 201; The Role of Hyaluronidase Inhibitor Heparin in Blood; David Glick; 214 Millard Hall.
- 1:30 - 2:30 Pediatric-Neurological Rounds; R. Jensen, A. B. Baker and Staff; U. H.
- 1:30 - 3:30 Dermatology Hospital Rounds; H. E. Michelson and Staff; Dermatology Histopathology Room, M-434, U. H.
- 4:00 - 5:00 Residents Conference; Presentation of Cases from Ancker Hospital; Heart Hospital Theater.
- 4:30 - ECG Reading Conference; Staff Room, Heart Hospital.
- 4:30 - Infectious Disease Rounds; Sta. 43, U. H.
- 4:30 - Public Health Seminar; Current Status of Poliomyelitis; Gaylord W. Anderson; 15 Owre Hall.
- 5:00 - 6:00 Urology-Roentgenology Conference; C. D. Creevy, O. J. Baggenstoss, and Staff; Eustis Amphitheater.

Ancker Hospital

- 8:30 - 10:00 Tuberculosis and Chest Conference; Auditorium.
- 2:00 - 3:00 Surgery Journal Club; Classroom.

Minneapolis General Hospital

- 9:30 - Pediatric Rounds; Eldon Berglund; Newborn Nursery, Station C.
- 10:30 - 12:00 Medicine Rounds; Thomas Lowry; Sta. F.
- 11:00 - Orthopedic and Fracture Rounds; Drs. John Moe and Arthur Zierold; Sta. A.
- 11:00 - Pediatric Rounds; Erling Platou; Station K.

Monday, November 23 (Cont.)

Minneapolis General Hospital (Cont.)

- 12:30 - Surgery Grand Rounds; Dr. Zierold; Sta. E.
- 1:30 - 2:30 Tuberculosis Conference; J. A. Myers; Sta. M.
- 2:00 - Pediatric Rounds; Robert A. Ulstrom; Stations I and J.

Veterans Administration Hospital

- 1:30 - Cardiac Conference; Drs. Berman, Weisbart, and Smith; Rounds Immediately following conference.

Tuesday, November 24

Medical School and University Hospitals

- 9:00 - 9:50 Roentgenology-Pediatric Conference; L. G. Rigler, I. McQuarrie and Staff; Eustis Amphitheater, U. H.
- 9:00 - 12:00 Cardiovascular Rounds; Station 30, U. H.
- 12:30 - 1:30 Physiology 114C -- Respiration; E. B. Brown; 129 Millard Hall.
- 12:30 - 1:20 Pathology Conference; Autopsies; J. R. Dawson and Staff; 102 I. A.
- 12:30 - 1:30 Bacteriology Seminar; Isolation and Cultivation of Animal Cells; A. G. Eiring; "Conditioned" Hemagglutination - Bacterial Products; Richard Berk; 214 Millard Hall.
- 3:30 - Pediatric Seminar; Adolescence, A Pediatric Problem; Rosalind Abernathy; Sixth Floor, U. H.
- 4:00 - 5:00 Pediatric Rounds on Wards; I. McQuarrie and Staff; U. H.
- 4:30 - 5:30 Clinical-Medical-Pathological Conference; Todd Amphitheater, U. H.
- 4:30 - ECG Reading Conference; James C. Dahl, et al; Staff Room, Heart Hospital.
- 5:00 - 6:00 X-ray Conference; Presentation of Cases by Veterans Hospital Staff; Dr. Jorgens, et al; Eustis Amphitheater, U. H.

Ancker Hospital

- 8:00 - 9:00 Fracture Conference; Auditorium.
- 9:00 - 10:00 Medical X-ray Conference; Auditorium.

Minneapolis General Hospital

- 9:30 - 10:30 Obstetrics and Gynecology Staff Rounds; William P. Sadler and Staff; 301 Harrington Hall.
- 10:00 - Pediatric Rounds; Spencer F. Brown; Stations I and J.
- 10:00 - Cardiac Rounds; Paul F. Dwan; Classroom, Sta. I.
- 11:00 - 12:00 Medicine-Surgery Conference; Classroom, Sta. M.
- 12:30 - 2:30 Dermatology Rounds and Clinic; Carl W. Laymon and Staff.
- 12:30 - ECG Conference; Boyd Thomes and Staff; 302 Harrington Hall.

Tuesday, November 24 (Cont.)

Minneapolis General Hospital (Cont.)

- 1:00 - Tumor Clinic; Drs. Eder, Coe, and Lipschultz; Classroom.
- 1:00 - Psychiatry Grand Rounds; J. C. Michael and Staff.

Veterans Administration Hospital

- 7:30 - Anesthesiology Conference; Conference Room, Bldg. I.
- 8:30 - Surgery Staff Seminar; Congenital Megacolon; Sol Center; Medical Conference Room, Bldg. I.
- 9:30 - Infectious Disease Rounds; Drs. Hall, Zinneman, and Brown.
- 9:30 - Surgery-Pathology Conference; Conference Room, Bldg. I.
- 10:30 - Surgery-Tumor Conference; L. J. Hay, J. Jorgens and Donn Mosser; Conference Room, Bldg. I.
- 1:00 - Review of Pathology, Pulmonary Tuberculosis; Conference Room, Bldg. I.
- 1:30 - Combined Medical-Surgical Chest Conference; Conference Room, Bldg. I.
- 2:00 - 2:50 Dermatology and Syphilology Conference; H. E. Michelson and Staff; Bldg. III.
- 4:00 - Thoracic Surgery Problems; Conference Room, Bldg. I.

Wednesday, November 25

Medical School and University Hospitals

- 8:00 - 9:00 Roentgenology Surgical-Pathological Conference; Paul Lober and L. G. Rigler; Todd Amphitheater, U. H.
- 11:00 - 12:00 Pathology-Medicine-Surgery Conference; Surgery Case; O. H. Wangenstein, C. J. Watson, and Staffs; Todd Amphitheater, U. H.
- 12:30 - 1:30 Physiology 114B -- Transport Seminar; Nathan Lifson and M. B. Visscher; 214 Millard Hall.
- 12:30 - 1:30 Radioisotope Seminar; Measurement Methods for the Clinical Laboratory; Sol Sandhaus; 12 Owre Hall.
- 1:00 - 2:00 Dermatology Clinical Seminar; 300 North Clinic.
- 1:30 - 3:00 Pediatric Allergy Clinic; Albert V. Stoesser and Lloyd Nelson; W-211 U. H.
- 3:30 - 4:30 Dermatology Pharmacology Seminar; J. D. Krafchuk; 3rd Floor Conference Room, Heart Hospital.
- 4:30 - 5:50 Dermatology Infectious Disease Seminar; J. D. Krafchuk; 3rd Floor Conference Room, Heart Hospital.
- 4:30 - ECG Reading Conference; Staff Room, Heart Hospital.
- 5:00 - 6:00 Residents Lecture; Cardiac Disease; Joseph Jorgens; Todd Amphitheater, U. H.
- 5:00 - 5:50 Urology-Pathological Conference; C. D. Creevy and Staff; Eustis Amphitheater, U. H.

Wednesday, November 25 (Cont.)

Medical School and University Hospitals (Cont.)

- 5:30 - 7:30 Dermatology Journal Club and Discussion Group; Hospital Dining Room.
7:30 - 9:30 Dermatology Pathology Seminar; Review of Interesting Slides of the Week; Robert W. Goltz; Todd Amphitheater, U. H.

Ancker Hospital

- 8:30 - 9:30 Clinico-Pathological Conference; Auditorium.
12:30 - 1:30 Medical Journal Club; Library.

Minneapolis General Hospital

- 8:30 - 9:00 Obstetrical and Gynecological Grand Rounds; William P. Sadler and Staff; Station C.
9:30 - Pediatric Rounds; Max Seham; Stations I and J.
10:30 - 12:00 Medicine Rounds; Thomas Lowry and Staff; Station D.
11:00 - Pediatric Seminar; Arnold Anderson; Classroom, Station I.
11:00 - Pediatric Rounds; Erling S. Platou; Station K.
12:15 - Pediatric Staff Meeting; Classroom, Station I.
1:30 - Visiting Pediatric Staff Case Presentation; Classroom, Station I.

Veterans Administration Hospital

- 8:30 - 10:00 Orthopedic X-ray Conference; E. T. Evans and Staff; Conference Room; Bldg. I.
8:30 - 12:00 Neurology Rehabilitation and Case Conference; A. B. Baker.
9:00 - Gastro-Intestinal Rounds; Drs. Wilson, Zieve, Hay, Brakel and Nesbitt.
12:30 - X-ray Conference; J. Jorgens; Conference Room, Bldg. I.
2:00 - Infectious Disease Conference and Rounds; Wesley W. Spink; Conference Room, Bldg. I.
5:00 - Medical Journal Club; Conference Room, Bldg. I.
7:00 p.m. Lectures in Basic Science of Orthopedics; Conference Room, Bldg. I.

Thursday, November 26 (HOLIDAY)

Friday, November 27

Medical School and University Hospitals

- 8:00 - 10:00 Neurology Grand Rounds; A. B. Baker and Staff; Station 50, U. H.
9:00 - 9:50 Medicine Grand Rounds; C. J. Watson and Staff; Todd Amphitheater, U. H.
10:30 - 11:50 Medicine Rounds; C. J. Watson and Staff; Todd Amphitheater, U. H.
10:30 - 1:50 Otolaryngology Case Studies; L. R. Boies and Staff; Out-Patient Department, U. H.

Friday, November 27 (Cont.)

Medical School and University Hospitals (Cont.)

- 11:00 - 12:00 Vascular Rounds; Davitt Felder and Staff Members from the Departments of Medicine, Surgery, Physical Medicine, and Dermatology; Out-Patient Department, Heart Hospital.
- 11:45 - 12:50 University of Minnesota Hospitals Staff Meeting; Coagulation of Blood; Paul G. Frick; Powell Hall Amphitheater.
- 1:00 - 2:50 Neurosurgery-Roentgenology Conference; W. T. Peyton, Harold O. Peterson and Staff; Todd Amphitheater, U. H.
- 1:30 - 2:30 Dermatology Grand Rounds; Presentation of Cases from Grouped Hospitals (University, Ancker, General and Veterans) and Private Offices; H. E. Michelson and Staff; Skin Clinic; W-312, U. H.
- 2:30 - 4:00 Dermatology Hospital Rounds; H. E. Michelson and Staff; Begin at Dermatology Histopathology Room, M-434, U. H.
- 3:00 - 4:00 Neuropathological Conference; F. Tichy; Todd Amphitheater, U. H.
- 4:00 - 5:00 124 Advanced Neurophysiology Lecture; Werner Koella and Ernst Gellhorn; 111 Owre Hall.
- 4:30 - 5:20 Ophthalmology Ward Rounds; Erling W. Hansen and Staff; E-534, U. H.
- 4:30 - ECG Reading Conference; James C. Dhal, et al; Staff Room, Heart Hospital.
- 5:00 - Urology Seminar and X-ray Conference; Eustis Amphitheater, U. H.

Ancker Hospital

- 1:00 - 3:00 Pathology-Surgery Conference; Auditorium.

Minneapolis General Hospital

- 9:30 - Pediatric Rounds; Wallace Lueck; Station J.
- 10:30 - Pediatric Surgery Conference; Oswald Wyatt; Tague Chisholm; Station I, Classroom.
- 12:00 - Surgery-Pathology Conference; Dr. Zierold, Dr. Coe; Classroom
- 1:00 - 3:00 Clinical Medical Conference; Thomas Lowry; Classroom, Station M.
- 1:15 - Pediatric X-ray Conference; Oscar Lipschultz; Classroom, Main Bldg.
- 2:00 - Pediatrics Rounds; Stations I and J.

Veterans Administration Hospital

- 10:30 - 11:20 Medicine Grand Rounds; Conference Room, Bldg. I.
- 2:00 - Autopsy Conference; E. T. Bell and Donald Gleason, Conference Room, Bldg. I.
- 1:00 - Chest Follow-Up Conference; E. T. Bell; Conference Room, Bldg. I.

Saturday, November 28

Medical School and University Hospitals

- 7:45 - 8:50 Orthopedic X-ray Conference; W. H. Cole and Staff; M-109, U. H.

Saturday, November 28 (Cont.)

Medical School and University Hospitals (Cont.)

- 9:00 - 10:00 Infertility Conference; Louis L. Friedman, David I. Seibel, and Obstetrics Staff; Eustis Amphitheater, U. H.
- 9:00 - 11:50 Medicine Ward Rounds; C. J. Watson and Staff; Heart Hospital Amphitheater.
- 9:15 - 10:00 Surgery-Roentgenology Conference; L. G. Rigler, J. Friedman, Owen H. Wangenstein and Staff; Todd Amphitheater, U. H.
- 10:00 - 11:30 Surgery Conference; Todd Amphitheater, U. H.
- 10:00 - 12:50 Obstetrics and Gynecology Grand Rounds; J. L. McKelvey and Staff; Station 44, U. H.

Ancker Hospital

- 8:30 - 9:30 Surgery Conference; Auditorium.

Minneapolis General Hospital

- 8:00 - Urology Staff Conference; T. H. Sweetser; Main Classroom.
- 11:00 - 12:00 Medical - X-ray Conference; O. Lipschultz, Thomas Lowry and Staff; Main Classroom.

Veterans Administration Hospital

- 8:00 - Proctology Rounds; W. C. Bernstein and Staff; Bldg. III.
- 8:30 - 11:15 Hematology Rounds; Drs. Hagen and Sherman.
- 11:15 - 12:00 Morphology Dr. Aufderheide; Conference Room.