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Bulletin of the
**University of Minnesota Hospitals
and
Minnesota Medical Foundation**



**Adenomas of the
Large Intestine**

BULLETIN OF THE
UNIVERSITY OF MINNESOTA HOSPITALS
and
MINNESOTA MEDICAL FOUNDATION

Volume XXIV

Friday, January 23, 1953

Number 14

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Published weekly during the school year, October to June, inclusive

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The Bulletin is sent to members of the Minnesota Medical Foundation.
Annual membership fee - \$10.00.

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I. ADENOMAS OF THE LARGE INTESTINE

Walter A. Fansler, M.D.

There is no accord concerning the origin and treatment of adenomas of the large intestine. Innumerable recent articles on the subject are an indication of the interest and also the lack of agreement in the consideration of this condition. A portion of this interest no doubt stems from the effort to discover lesions which are precancerous in nature and to discover cancers in the early stage of the disease. To date much investigation has produced no agreement as to either their causation or all phases of treatment. With this in mind it might be interesting to re-evaluate some of the facts and theories we have concerning adenomas and to suggest some further lines of investigation which might lead to a more definite agreement on this subject. This should be of special interest to a group in a teaching institution where adequate facilities are available for investigation. It is perhaps unnecessary to mention the proper diagnosis. Approach to this problem is to rely entirely upon proctoscopic examination for that portion of the bowel which can be visualized by this instrument and upon roentgenologic examination for the remainder of the bowel. It may be advisable to comment upon the advances made in x-ray examinations by the use of air contrast studies using injection media of various types and densities. Besides the use of proper physical agents if small lesions are to be demonstrated the work must be done by someone who is well versed in this phase of x-ray diagnosis. Furthermore he must be really interested in colon work so he will have the patience and take the time to do the examination properly. He must be a perfectionist and willing to repeat the examination until he can be sure no lesion is missed and that any suspicious area is actually a defect in the bowel wall and not an artefact. With careful examination we may feel that if there is a lesion present one centimeter or more in diameter it will be demonstrated and very frequently much smaller lesions can be shown. Slipshod examinations for this

type of tumor are worse than useless since small lesions will seldom be shown and both physician and patient are lulled into a sense of false security by a negative report from the roentgenologist.

Certain facts have been quite clearly established. At least five percent of persons reaching the age of sixty have one or more adenomas of the large bowel. This was confirmed in 1,460 autopsies excluding all cases of multiple polyposis. Approximately three percent of individuals between the ages of one and forty years will have one or more adenomas. This percentage increases with age and after the age of seventy twenty-four percent of individuals have been shown to have adenomas. Another investigation, which included some 1,800 autopsies, showed the presence of adenomas in seven percent and in forty-two percent of these more than one adenoma was present. Seventy percent of these were within reach of the 25 cm. proctoscope. It may be of more than passing significance since this is also the area in which a comparable percentage of bowel malignancy develops. Neither the size nor the appearance of the polyp tells whether the lesion is benign or malignant. Hellwig states in his series of cases that the average size of polyps which were shown to be malignant on microscopic examination was 1.8 cm. This is of interest in observing polyps but regardless of size all polyps should be eradicated. Incidentally, I have personally removed two polyps which were 3 millimeters in diameter in which the microscopic diagnosis was definitely that of adenocarcinoma.

Usually small adenomas of this size are fulgurated without biopsy and it is quite likely that if all were subjected to microscopic study the incidence of malignancy would be substantially higher than is generally supposed. We do not know the agent, carcinogenic or otherwise, which causes the formation of adenomas but we do know certain conditions under which polyps frequently develop. The most well known perhaps is ulcerative colitis or any other chronic ulceration of the large bowel. In these cases

the tumors usually occur around the margin of an active ulcer or the cicatrix of a healed ulcer. Epithelial tags are frequent around an ulcer - some of these remain as tags of rectal mucosa and others undergo adenomatous change.

Multiple polyposis of the colon is definitely a familial disease. I do not intend to discuss this phase of polyposis but so far as I know there is no way of differentiating clinically or microscopically an adenoma which occurs in multiple polyposis from one which simply occurs as a single, solitary adenoma in the bowel. This might suggest that the formation of an adenoma either as a single, isolated tumor or on a familial basis has a common inciting agent and that in the familial type the inciting agent is much more pronounced. If this is the case then patients with multiple polyposis offer a most unusual chance to study microscopically the formation of adenomas since the tumors may be seen in all stages of development. We did take the opportunity of making such a study in one case. This particular patient had innumerable lesions. These ranged from tiny shot-like nodules beneath the rectal mucosa to two large tumors showing frank carcinomatous change. The smallest lesions were tiny one or two millimeter sized nodules which could be palpated underneath the mucosa. The mucosa over these lesions was normal in appearance and no visible elevation of the mucosa was noted. Other nodules caused a definite elevation of the mucosa and over still larger nodules the overlying mucosa was definitely reddened. Beyond this stage were small reddened non-pedunculated adenomas. As they further enlarged, various forms of pedicle formation were noted. I am sure that these different lesions simply represent the stages in the formation of adenomas. If the smallest submucosal nodules were examined microscopically they were found to be tiny nodules of small round lymphocytic cells. In the larger nodules, inflammatory changes were noted. The mucosal surface over the nodule thinned out and became eroded. These findings were presented at a meeting of the Section of Gastro-enterology and Proctology of the American Medical Association in

1930. Somewhat later Pargen and others presented somewhat similar findings with diagrammatic illustrations showing how these nodules formed in the manner described but showed definite ulcerating changes in the epithelial surface as the growth increased in size. Following ulceration the typical adenomatous polyps developed. I think it is questionable whether infection has anything to do with the causation of the adenoma. Rather, I would be inclined to believe that the infection was simply an incidental occurrence and that the adenomatous change in the mucosa had no connection with the ulcerative condition. In 1950 I had the opportunity of observing a patient who was intensely interesting to me and I think may be of some significance concerning the formation of some polyps. On December 14, 1950, I was asked to proctoscope a forty-seven year old female patient. There was a small adenoma approximately two millimeters in diameter eight centimeters from the anal margin. At fourteen centimeters on the left was another small projection of the mucosa. On the right wall of the rectum at approximately twelve centimeters was a much larger lesion. This was represented by a non-pedunculated protrusion about 1.5 cm. in diameter raised approximately one centimeter above the surrounding mucosa. The mucosa covering this lesion was somewhat reddened and tense but there was no sign of any other changes. The patient was observed again on January 8, 1951, which was just twenty-five days after the preceding examination. At this time the two small polyps were unchanged. At the site of the larger lesion there was a cauliflower lesion typical in appearance to a papillary adenoma. I can only liken this development to a rose bud which over night burst into a full blown rose. The lesion was removed locally. Microscopic examination of this tumor was as follows:

"A papillary tumor, fairly well differentiated epithelium with low dark stain, tall and columnar. Two or three small areas show epithelium much less well differentiated forming varying atypical glandular structures which have a definite and invasive quality and are penetrating in an

irregular fashion to the muscularis mucosa and into the inflammatory fibrous connective tissue stroma of the submucosal connective tissue. There seemed to be no definite invasion of the true muscular coats. This tumor represents a rectal polyp with probably early malignant changes."

This patient has been seen several times since and in July of 1951 there was no evidence of any recurrence. On July 9, 1952, at the 17 cm. level there was a small adenoma approximately three millimeters in diameter which was fulgurated without further examination. This to me would seem to indicate that perhaps some tumors may on occasion develop underneath the mucosa and then suddenly burst forth as fully developed adenomas. This is in line with the observation that occasionally a nodule will be noted in the rectum which is covered with perfectly normal mucosa except perhaps a little reddened area on the upper surface but biopsy in the deeper structures will show an adenocarcinoma lying completely underneath the mucosa which is quite normal in appearance. These observations may indicate that the inciting factor in either adenoma or carcinoma originates underneath the rectal mucosa and that irritation or ulceration of the mucosal surface is a secondary condition and not a cause of tumor formation. It is admitted that this is purely deductive reasoning but it may suggest a thought for further investigation.

Another point upon which there is no accurate information is the percentage of adenomas which undergo malignant degeneration. Estimates vary from five to twenty percent. These figures are ridiculous if all adenomas from the two millimeter size up are considered. To clarify the situation it would be of interest to endeavor to classify adenomas as to size and then attempt to estimate the percentage which become malignant, according to their size, also the percentage of pedunculated and non-pedunculated adenomas which were malignant. In general, it is probably wise to destroy all small adenomas simply because it is easier for the physician and less disa-

greeable for the patient than to have repeated proctoscopic examinations for checking the tumor. However, to tell a patient who has a small "tear drop" adenoma that from five to twenty percent become malignant is untrue and arouses unnecessary fear and apprehension. While destroying these small lesions is the simplest way, for the purpose of increasing our knowledge, however, it would be valuable to not destroy such lesions but observe them at monthly intervals for a year or longer to find what changes if any did occur. While this would be difficult for the individual physician it could well be a project for a teaching clinic or a diagnostic clinic such as the Cancer Detection Center. Certainly with this close observation no harm could come to the patient if, upon signs of change, the adenoma were excised for microscopic study and the base destroyed by fulguration. Such observation might eventually lead to some definite conclusions as to the percentage of these polyps which increase in size and/or undergo malignant change.

Concerning the treatment of polyps which lie below the peritoneal reflection there is quite general agreement. They may be removed with the electric snare, by excision of the polyp or destroyed by either complete or fractional fulguration. Except in the case of very small adenomas which are attached only to mucosa they should be removed for biopsy. The most difficult to remove are of course the fairly large non-pedunculated lesions. On the other hand, these are the ones in which it is most essential that adequate study of all of the tumor be made. The only way adequate study can be done is by the surgical removal which preserves the entire tumor. Polyps which lie above the peritoneal reflection which have long pedicles may be biopsied and then destroyed by fractional fulguration. It is my opinion that this is the safest and best procedure in these polyps. If this is done carefully there is no danger of perforation of the bowel wall and the tumor may be safely burned well into the pedicle. The use of the snare in this area is not without danger and there are numerous cases on record of the bowel wall having

been perforated. This is usually caused by the bowel wall being dragged out by the polyp and so actually becomes part of the pedicle. Any flat type of tumor more than a few millimeters in diameter or those which have a large meaty pedicle should be removed by the trans-abdominal route.

Perhaps the greatest divergence of opinion at the present moment is in the case of polyps which are definitely beyond the reach of the proctoscope and which all are agreed should be removed by laparotomy. Disagreement comes as to what is the proper procedure after the abdomen is opened. There are at present three schools of thought.

1. Single polyps which have a definite pedicle should be removed following a colotomy by simply ligating the pedicle near its base and then dividing it proximal to the point of ligature.

2. When a single polyp is present (pedunculated or otherwise) segmental resection of the bowel should be done.

3. The third group feel that a hemicolectomy or complete colectomy is indicated.

While either a colectomy or segmental resection can be done on the average patient without too great a surgical risk it does seem to me in the case of single pedunculated polyps, that as a routine measure either operation is out of proportion to the pathology present. It is certainly true that with a colectomy the patient cannot develop any more adenomas in the colon. Still it seems to me that such an operation is much more extensive than the situation warrants as to risk, hospital expense and expenditure of the surgeon's time. So far as I know there have been but two instances in which we have removed single polyps of the colon by simple polypectomy in which there has been subsequent development of another polyp. With this experience in mind it is still our custom where a single pedunculated polyp exists to incise the bowel in the region of the polyp and pass a sterile proctoscope in each direction as far as possible. If no other lesion is

seen we simply ligate the pedicle and remove the polyp. On the other hand, if we encounter a large polyp or one which is non-pedunculated or has a short thick pedicle, we do a segmental resection.

If we do not do a colectomy for a single polyp then how many polyps and of what nature, size and distribution must they be before a colectomy is indicated? This is indeed the sixty-four dollar question for all of those who do not believe in universal colectomy. The family history is of importance, particularly whether or not other members of the family have developed polyps of the colon or whether there have been instances of carcinoma of the gastro-intestinal tract, particularly of the colon. In the face of a bad family history we believe the surgeon should be more radical.

In view of our observation of the behavior of colonic adenomas over a period of a good many years we feel that if a patient with a good family history polyp-wise has two widely separated pedunculated polyps which are obviously benign we are justified in doing a simple double polypectomy, in each case carefully checking the colon with the proctoscope for additional adenomas. If the polyps have little or no pedicle, colectomy or at least segmental resections are done. If three quite widely distributed polyps are present we are inclined to do a colectomy except in aged patients or poor surgical risks. Our reason for this rather conservative approach to this problem is our observation that the formation of additional polyps following polypectomy is a rare occurrence. For this reason we feel that the greater operative risk of colectomy, the greater loss of time to the patient, the greater hospital expense involved and the greater amount of time expended by the surgeon make colectomy or segmental resection as a more or less routine measure an unjustifiable procedure.

There are several suggestions which over a period of years might help clarify the situation.

1. A large series of small adenomas, particularly the small non-pedunculated

lesions, be removed for measurement and microscopic study. From this we could learn just what percentage and what sized adenomas would actually show carcinomatous change.

2. Another large series of similar lesions could be observed at monthly intervals over a period of one to five years. From this we could learn what percentage of these lesions developed in size and eventually underwent malignant change.

3. In instances of multiple polyposis the lesions in various stages of

development carefully studied.

4. A central registration center could be established for the registration of patients who had polyps removed by laparotomy. All surgeons should be encouraged to register his patient provided he would submit definite, factual data and make follow up reports.

These suggestions are impractical for an individual but for a long time project for a group or institution they are possible and should be productive of information of definite and permanent value.

II. MEDICAL SCHOOL NEWS

Coming Events

January 26-31 Continuation Course in Pediatric Neurology for Pediatricians, Neurologists, and General Physicians
February 2-4 Continuation Course in Clinical Chemistry for General Physicians
February 5-7 Continuation Course in Cancer Detection for General Physicians
February 12-14 Continuation Course in Cardiovascular Diseases for General Physicians
February 16-18 Continuation Course in Recent Advances in Diagnosis for Internists
February 17 Phi Delta Epsilon Lecture; "Iron Metabolism and Iron Deficiency Anemia"; Dr. Carl V. Moore, Professor, Department of Medicine, Washington University School of Medicine, St. Louis; Owre Amphitheater; 8:00 p.m.

* * *

Continuation Courses

A continuation course in Clinical Chemistry, Bacteriology, and Hematology for General Physicians will be presented by the University of Minnesota from February 2 to 4, 1953. The first of its kind to be presented at the University, the course has been designed to meet the needs of the practitioner who is setting up a laboratory in his office or who is supervising the laboratory in his community hospital. A minimum of didactic material will be presented. Registrants will spend most of their time during the three-day session at the laboratory benches. One half-day will be devoted to blood-banking procedures while the remainder of the program will be flexible, permitting each registrant to work with the procedure or procedures of most value and interest to him. Highly qualified instruction under the direction of Dr. Gerald T. Evans will be available at all times for individual questions and problems.

The University of Minnesota will be joined by the Minnesota Division of the American Cancer Society in the presentation of a continuation course in Cancer Detection for General Physicians on February 5-7, 1953. With emphasis on the fact that "each doctor's office can be a cancer detection center," registrants for the course will spend their time in the University's Cancer Detection Center where they will participate directly in the diagnostic activities. Registration will be strictly limited in order that each registrant may obtain maximum benefit. A brief introductory session will be held at the Center for Continuation Study at 8:30 a.m. on Thursday, February 5, but the remainder of the course will be held in the nearby Cancer Detection Center and the University Hospitals. Housing accommodations will be available at the Center for Continuation Study as usual.

* * *

Bulletin Adds New Feature

Beginning in February, the "Bulletin of the University of Minnesota Hospitals and Minnesota Medical Foundation" will contain a new feature, a section consisting of a list of the "Publications of the Medical School Faculty". This will appear in the Bulletin at intervals of approximately four weeks.

Although interchange of ideas takes place at the weekly staff meetings and at many other functions, it is believed that many of our faculty members at times find
(continued on next page)

themselves unaware of some of the interesting studies that their colleagues are carrying out. The Bulletin, which is distributed to our faculty and to all members of the Minnesota Medical Foundation, would seem to be an excellent means of disseminating information concerning the investigative activities of the various members of the faculty. The success of this feature will be dependent upon the cooperation of the faculty. In the near future each member of the faculty will receive a request that the office of the editor of the Bulletin be notified whenever an article of his is published. It is suggested that this might be most easily done by having a reprint of each publication sent to the editor at the time the reprints become available.

Limitations of space in the Bulletin will prevent an attempt to make this list retroactive to any considerable extent. The editor is therefore particularly interested in articles published during and after October, 1952. Any suggestions concerning this feature will be warmly received.

* * *

Notice to Medical Staff Members

The Minneapolis Hospital Council is conducting a survey of public opinion and attitudes toward hospital care in Hennepin County. This survey is to be used as a basis for a planned public relations program by the Hospital Council. It is felt that it is essential that the Council know in a very specific way what the community now knows and thinks about hospitals before an attempt is made to interpret the hospitals to the community.

We know that every doctor is called upon by his patients to interpret certain phases of hospital operation. For this reason the Hospital Council thinks it is necessary to sample the attitudes and opinion of some of the members of their respective medical staffs.

The survey is being conducted by the Department of Research, School of Journalism at the University of Minnesota. Sometime during the month of January or February you may be called on by a professional interviewer and asked a few brief questions. The Minneapolis Hospital Council will appreciate your cooperation in this matter and would like to urge you to give the interviewer a free expression of your opinion.

* * *

Marie Apelt Retires

January 2 marked the retirement of Mrs. Marie Apelt who has served the University Hospitals since July, 1934, as telephone switchboard operator. Her friendly voice, pleasant personality, and spirit of helpfulness will be missed by staff members, fellows, and interns alike. We join in the hope that her years of retirement will bring new pleasures. We daresay, however, that she will miss the incomparable excitement of a busy hospital switchboard.

* * *

Miss Filson Resigns

Miss Margaret Filson has resigned as Director of Nursing Services after almost six years in that position. She has been succeeded in that post by Miss Florence Julian who took over her new duties on January 1. After a brief vacation Miss Filson
(continued on next page)

will return for three months to assist in the ordering of equipment for the new hospital units in the Mayo Memorial building. The entire staff regrets the loss of Miss Filson from this position that she has filled so well. We know, however, that Miss Julian will carry out the responsibilities of the post in exceedingly capable fashion.

* * *

Faculty News

Dr. Richard Magraw, Assistant Professor of Medicine and Psychiatry and Hospital Admitting Physician, has departed for military service. Dr. Richard Frey, Instructor in the Department of Medicine, is now Hospital Admitting Physician in the Medical Out-Patient Department.

Dr. Leo G. Rigler, Professor and Head of the Department of Radiology, has been elected to another six-year term as a Trustee of the American Board of Radiology. He has also been made Associate Editor of RADIOLOGY. We offer warmest congratulations to Dr. Rigler on these two well-deserved honors. Another honor has been bestowed on our peripatetic Professor of Radiology. He has been selected as a member of a "Visiting Team of Medical Scientists" which will spend February and March in India under the auspices of the World Health Organization and the Unitarian Service Committee. The team will visit medical schools in Madras and Bombay holding conferences and giving lectures in the field of public health and medical education. The team is comprised of sixteen physicians, five from the United States and eleven from abroad. Included in the team are two former Nobel Prize Winners in Medicine, Sir Alexander Fleming and Dr. Corneille Heymans. The team also includes many other distinguished physicians from abroad.

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III.

UNIVERSITY OF MINNESOTA MEDICAL SCHOOL
WEEKLY CALENDAR OF EVENTS

Physicians Welcome

January 26 - 31, 1953

Monday, January 26

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 Staff Seminar; Tendon Transplants and Arthrodeses in Lower Extremities After Polio; G. K. Stillwell; Heart Hospital Auditorium.
- 12:15 Obstetrics and Gynecology Journal Club; Staff Dining Room, U. H.
- 12:30 - 1:30 Physiology Seminar; Banthine: Effect on Peptic Ulcer; Raymond N. Bieter; 214 Millard Hall.
- 1:30 - 2:30 Pediatric-Neurological Rounds; R. Jensen, A. B. Baker and Staff; U. H.
- 4:00 - Pediatric Seminar; Hearing Disabilities in Children; Lawrence Boies; Sixth Floor West, U. H.
- 4:00 - 5:30 Seminar on Fluid and Electrolyte Balance; Gerald T. Evans; Todd Amphitheater, U. H.
- 4:30 - ECG Reading Conference; James C. Dahl, et al; Staff Room, Heart Hospital.
- 4:30 - Public Health Seminar; 15 Owre Hall.
- 4:30 - 6:00 Physiology 114A and Cancer Biology 140 -- Research Conference on Cancer, Nutrition, and Endocrinology; Drs. Visscher, Bittner, and King; 129 Millard Hall.
- 5:00 - 6:00 Urology-Roentgenology Conference; C. D. Creevy, O. J. Baggenstoss, and Staff; Eustis Amphitheater.

Minneapolis General Hospital

- 9:30 - Pediatric Rounds; Eldon Berglund; Newborn Nursery, Station C.
- 10:30 - 12:00 Tuberculosis and Contagion Rounds; Thomas Lowry; Station M.
- 11:00 - Pediatric Rounds; Erling Platou; Station K.
- 12:30 - Surgery Grand Rounds; Dr. Zierold; Sta. A.
- 1:00 - X-ray Conference; Classroom, 4th Floor.
- 2:00 - Pediatric Rounds; Robert A. Ulstrom; Stations I and J.

Monday, January 26 (Cont.)

Ancker Hospital

- 8:30 - 10:00 Chest Disease Conference
- 1:00 - 2:00 Medical Grand Rounds.

Veterans Administration Hospital

- 8:00 - 9:00 Neuroradiology Conference; J. Jorgens, R. C. Gray; 2nd Floor Annex.
- 9:00 - G. I. Rounds; R. V. Ebert, J. A. Wilson, Norman Shriffter; Bldg. I.
- 11:30 - X-ray Conference; J. Jorgens; Conference Room, Bldg. I.
- 2:00 - Psychosomatic Rounds; Bldg. 5.

Tuesday, January 27

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 - 1:20 Pathology Conference; Autopsies; J. R. Dawson and Staff; 102 I. A.
- 12:30 - 1:30 Physiology 114D -- Current Literature Seminar; 129 Millard Hall.
- 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 from Ancker Hospital; Drs. Aurelius, Peterson, and Olfelt; Eustis Amphitheater, U. H.

Ancker Hospital

- 8:30 - 9:30 Medical-Roentgenology Conference; Auditorium.
- 1:00 - 2:30 X-ray - Surgery 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; Station I; Classroom.
- 10:30 - 12:00 Medicine Rounds; Thomas Lowry and Staff; Station F.
- 12:30 - Grand Rounds; Fractures; Sta. A; Willard White, et al.
- 12:30 - Neuroroentgenology Conference; O. Lipschultz, J. C. Michael and Staff.
- 12:30 - EKG Conference; Boyd Thomes and Staff; 302 Harrington Hall.
- 1:00 - Tumor Clinic; Drs. Eder, Cal, and Lipschultz.
- 1:00 - Neurology Grand Rounds; J. C. Michael and Staff.

Tuesday, January 27 (Cont.)

Veterans Administration Hospital

- 7:30 - Anesthesiology Conference; Conference Room, Bldg. I.
8:30 - Infectious Disease Rounds; Dr. Hall.
8:45 - Surgery Journal Club; Conference Room, Bldg. I.
9:00 - Liver Rounds; Drs. Nesbitt and MacDonald.
9:30 - Surgery-Pathology Conference; Conference Room, Bldg. I.
10:30 - Surgery Tumor Conference; L. J. Hay, J. Jorgens; Conference Room, Bldg. I.
1:00 - Chest Surgery Conference; Drs. Kinsella and Tucker; Conference Room, Bldg. I.
2:00 - 2:50 Dermatology and Syphilology Conference; H. E. Michelson and Staff; Bldg. III.
3:30 - 4:20 Clinical Pathological Conference; Conference Room, Bldg. I.

Wednesday, January 28

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 Staff; Todd Amphitheater, U. H.
12:30 - 1:30 Radioisotope Seminar; Effect of Radiation on Electrolyte and Water Balance; W. O. Caster; 12 Owre Hall.
1:30 - 3:00 Physiology 114B -- Circulatory and Renal System Problems Seminar; Dr. M. B. Visscher, et al; 214 Millard Hall.
4:00 - 5:30 Physiology 114C -- Permeability and Metabolism Seminar; Nathan Lifson; 214 Millard Hall.
4:30 - ECG Reading Conference; James C. Dahl, et al; Staff Room, Heart Hospital.
5:00 - 5:50 Urology-Pathological Conference; C. D. Creevy and Staff; Eustis Amphitheater, U. H.
8:00 - 10:00 Dermatological-Pathology Conference; Review of Histopathology Section; R. Goltz; Todd Amphitheater, U. H.

Ancker Hospital

- 8:30 - 9:30 Clinico-Pathological Conference; Auditorium.
2:00 - 4:00 Medical Ward Rounds;
3:30 - 4:30 Journal Club; Surgery Office.

Minneapolis General Hospital

- 8:30 - 9:30 Grand Rounds; William P. Sadler and Staff; Sta. C.

Wednesday, January 28 (Cont.)

Minneapolis General Hospital (Cont.)

- 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 - Pediatrics Staff Meeting; Classroom, Station I.
- 1:30 - Visiting Pediatric Staff Case Presentation; Station I, Classroom.

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.
- 2:00 - 4:00 Infectious Disease Rounds; Main Conference Room, Bldg. I.
- 4:00 - 5:00 Infectious Disease Conference; Wesley W. Spink; Conference Room, Bldg. I.
- 4:00 - Combined Medical-Surgical Conference; Conference Room, Bldg. I.
- 7:00 p.m. Lectures in Basic Science of Orthopedics; Conference Room, Bldg. I.

Thursday, January 29

Medical School and University Hospitals

- 8:00 - 9:00 Vascular Rounds; Davitt Felder and Staff Members from the Departments of Medicine, Surgery, Physical Medicine, and Dermatology; Heart Hospital Amphitheater.
- 9:00 - 11:50 Medicine Ward Rounds; C. J. Watson and Staff; E-221, U. H.
- 11:00 - 12:00 Cancer Clinic; K. Stenstrom and A. Kremen; Todd Amphitheater, U. H.
- 12:30 - Physiological Chemistry Seminar; Lipoic Acid Conjugate; N. Mizuno; 214 Millard Hall.
- 1:30 - 4:00 Cardiology X-ray Conference; Heart Hospital Theatre.
- 4:00 - 5:00 Physiology-Surgery Conference; Todd Amphitheater, U. H.
- 4:30 - 5:20 Ophthalmology Ward Rounds; Erling W. Hansen and Staff; E-534, U. H.
- 4:30 - ECG Reading Conference; James C. Dahl, et al; Staff Room, Heart Hospital.
- 5:00 - 6:00 X-ray Seminar; The Relation of Radiation Sickness to Adrenal Status; Elliott C. Lasser; Eustis Amphitheater, U. H.
- 7:30 - 9:30 Pediatric Cardiology Conference and Journal Club; Review of Current Literature 1st hour and Review of Patients 2nd hour; 206 Temporary West Hospital.

Ancker Hospital

- 4:00 - Medical-Pathological Conference; Auditorium.

Thursday, January 29 (Cont.)

Minneapolis General Hospital

- 9:30 - Neurology Rounds; Heinz Bruhl; Station I.
- 10:00 - Pediatric Rounds; Spencer F. Brown; Station K.
- 10:00 - Psychiatry Grand Rounds; J. C. Michael and Staff; Sta. H.
- 1:00 - Fracture - X-ray Conference; Dr. Zierold; Classroom.
- 1:00 - House Staff Conference; Station I.
- 2:00 - 4:00 Infectious Disease Rounds; Classroom.
- 4:00 - 5:00 Infectious Disease Conference; Wesley W. Spink; Classroom.

Veterans Administration Hospital

- 8:00 - Surgery Ward Rounds; Lyle Hay and Staff; Ward 11.
- 8:00 - Surgery Grand Rounds; Conference Room, Bldg. I.
- 11:00 - Surgery-Roentgen Conference; J. Jorgens; Conference Room, Bldg. I.

Friday, January 30

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 - 11:50 Otolaryngology Case Studies; L. R. Boies and Staff; Out-Patient Department, U. H.
- 11:45 - 12:50 University of Minnesota Hospitals Staff Meeting; Clinical and Physiologic Study of the Results of Valvulotomy in Patients with Mitral Stenosis; A. M. Richards, Ivan D. Baronofsky, Craig Borden; Powell Hall Amphitheater.
- 1:00 - 2:50 Neurosurgery-Roentgenology Conference; W. T. Peyton, Harold O. Peterson and Staff; Todd Amphitheater, U. H.
- 3:00 - 4:00 Neuropathological Conference; F. Tichy; Todd Amphitheater, U. H.
- 4:00 - 5:00 Physiology 124 -- Seminar in Neurophysiology; Ernst Gelhorn; 113 Owre Hall.
- 4:30 - ECG Reading Conference; James C. Dahl, 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.

Friday, January 30 (Cont.)

Minneapolis General Hospital (Cont.)

- 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 - X-ray Conference; Oscar Lipschultz; Classroom, Main Bldg.
- 2:00 - Pediatric Rounds; Robert Ulstrom; Stations I and J.

Veterans Administration Hospital

- 1:00 - Pathology Slide Conference; E. T. Bell; Conference Room, Bldg. I.
- 10:30 - 11:20 Medicine Grand Rounds; Conference Room, Bldg. I.

Saturday, January 31

Medical School and University Hospitals

- 7:45 - 8:50 Orthopedic X-ray Conference; W. H. Cole and Staff; M-109, U. H.
- 9:00 - 10:00 Infertility Conference; Louis L. Friedman, David I. Seibel, and Obstetrics Staff; Station 54.
- 9:00 - 10:30 Pediatric Grand Rounds; I. McQuarrie and Staff; Eustis Amphitheater.
- 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.
- 11:30 - Anatomy Seminar; Experiments on Phagocytosis In Vivo; Samuel O. Cornwell; 226 Institute of Anatomy.

Ancker Hospital

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

Minneapolis General Hospital

- 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, Goldish, and Aufderheide.
- 11:15 - 12:00 Morphology Dr. Aufderheide.