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

Surgical Relief of Pain

Volume XII | Friday, February 28, 1941 | Number 18

STAFF MEETING BULLETIN
HOSPITALS OF THE . . .
UNIVERSITY OF MINNESOTA

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

Financed by the Citizens Aid Society.

William A. O'Brien, M.D.

I. LAST WEEK

Date: Feb. 21, 1941

Place: Recreation Room
Powell Hall

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

Program: Movie: "Donald's Better Self"

Legg-Perthes' Disease
F. G. Rosendahl

Knee Joint Injuries
R. C. Brown

Discussion
E. T. Evans
L. G. Rigler

Present: 159

Gertrude Gunn
Record Librarian

- - -

II. MOVIE

Title: "The Practical Pig"
A Walt Disney Short

Released by: R-K-O

- - -

III. ANNOUNCEMENTS

1. LECTURE

"Enlargement of the Heart"
Paul D. White, Friday, February 28, at 8:15 p.m., Museum of Natural History Auditorium.

- - -

2. THE MINNESOTA PATHOLOGICAL SOCIETY

The University of Minnesota
Medical School

Amphitheater, Medical Sciences
Tuesday, March 4, 1941, 8:00 p.m.

Hemolytic anemias

Dr. W. B. Castle
Professor of Medicine
Harvard University

- - -

3. CLINICAL RESEARCH CLUB

A meeting of the Clinical Research Club, University of Minnesota, will be held in Eustis Amphitheater at 8:00 p.m., Monday, March 3. The following papers will be presented:

(1) Evaluation of Surgical Attempts at Reduction of Gastric Acidity.
(15 minutes)
Bernard Lannin, M.D.
Department of Surgery

(2) Renal Excretion of Electrolytes after Intravenous Administration of Sodium Chloride in Diabetes Insipidus.
(15 minutes)
W. R. Murlin, M.D.
Department of Pediatrics

(3) Physiologic Studies in Insulin Hypoglycemia.
(15 minutes)
Ralph Rossen, M.D.
Division of Neuropsychiatry

(4) Local Implantation of Crystalline Sulfanilamide about Gastrointestinal Anastomoses in Dogs; An Adjunct to the Prevention of Peritonitis.
(15 minutes)
Richard Varco, M.D.
Department of Physiology

All those interested are invited to attend.

IV. SURGICAL RELIEF OF PAIN

William T. Peyton
Lyle A. French

Next to the saving of life, the relief of pain is one of the physician's most important functions. Pain that is not well relieved by opiates or that is apt to be so prolonged that opiates become ineffectual should, if possible, be relieved by surgery. Surgery should not be delayed until opiates have lost their effect through long administration for at that time the patient may be in no condition to have surgical procedures performed. Therefore this is a review of the surgical measures performed at the University Hospitals for the relief of intractable pain exclusive of neuralgias. It includes all cases of subarachnoid alcohol injection done here since January 1935, as well as those rhizotomies, cordotomies, and tractotomies done since the Division of Neurosurgery was created in July, 1937. Included in this report are 78 alcohol injections on 59 patients, 9 rhizotomies, 5 tractotomies, and 16 cordotomies.

Subarachnoid Alcohol Injection

In 1930 Dogliotti[1,2] introduced the technique of subarachnoid alcohol injection which has, with minor alterations, been adopted by many neurosurgeons. Dogliotti accepted the theories of Muller-Lugaro[3] which state that there is no specific stimulus for pain and that it is necessary only to reduce the number and intensity of stimuli to relieve pain. He postulated that by injecting alcohol into the subarachnoid space he could destroy enough fibers so that stimuli would not be registered as a sensation of pain. His technique[3], essentially, is to place the patient in a position similar to that for spinal puncture but with elevation on pillows or blocks of that part of the spine giving exit to the pain bearing roots and therefore the level at which the alcohol is to be supernated. A known amount of absolute alcohol is then slowly injected. After the injection the patient is kept on his side, in the same position in which the injection was made, for at least 30 minutes. Abraham[4] advocates two hours but this increased length of time does not seem to improve the results.

Numerous variations of this technique have been employed. Greenhill and Schmitz[5] as well as others[6,7] advocate the forward rotation of the patient so that the posterior roots are uppermost and so are mostly affected. This, however, has been found not to be necessary for good results. The optimum amount of alcohol to be injected is not entirely settled. Amounts from 0.4 cc. to 2.0 cc. have been used. Usually 1 cc. is considered most suitable. Absolute alcohol has a specific gravity of 0.799 at 20°C and becomes supernated over the cerebrospinal fluid which has a specific gravity of 1.007. Poor results are obtained if barbotage (the procedure of mixing spinal fluid with alcohol and reinjecting it) is practiced. This obviously prevents the alcohol from supernating above the cerebrospinal fluid and from reaching an effective concentration. The exact 'active' concentration of alcohol within the subarachnoid space that will cause temporary anesthesia remains to be determined but is approximately 30%. In greater concentration it may produce somatic motor paralysis in addition to sensory paralysis[7].

At the time of injection there are signs of intraspinal or meningeal irritation characterized by transient paraesthesias and burning in the distribution of the roots bathed in the supernated alcohol. The patient often has a sense of relief of pain as well as warmth and numbness in the extremity during or immediately following the injection. Goff[6] states that this sense of warmth supports the theory of pain conductivity along fibers also carrying heat, cold, pressure, and touch, rather than via a separate system of neurons. Occasionally the pain returns in 2-3 days but if it does it usually again disappears in two weeks following the injection. This recurrence and disappearance of pain has occurred in 50% of Abraham's[4] cases, however such a sequence has not been so frequently observed in this clinic.

Complications have followed the in-

jection of alcohol into the subarachnoid space. Numbness in the area supplied by the affected roots is the most common. This, however, is not serious and is readily accepted by the patient in exchange for pain. The ankle jerk is often diminished or abolished. After bilateral injections there may develop a conus medullaris syndrome[8], that is, retention of feces and urine, anaesthesia of the leg, and absent or diminished ankle jerk. The retention of feces and urine if it is more than transitory is more serious, but fortunately it seldom occurs. Transitory urinary retention lasting 24 - 48 hours more frequently occurs and is especially apt to occur where vesical dysfunction existed before injection[9]. Mild abdominal distention, relieved by enemas, has been reported[10]. All degrees of motor impairment from slight hypotonicity of muscles lasting a few weeks to complete paralysis of an extremity have been reported[5,7,9,10]. Adson's[7] experience has been as follows: "16 M of 95% or absolute alcohol introduced into any space above the second lumbar does not cause motor paralysis. Injected between the second and third lumbar vertebra this dose does invariably cause paralysis of rectum and bladder but at this level a dose of 8 M does not cause this complication. Below the third lumbar interspace, with the pelvis elevated, the larger dose of 16 M usually does not cause this complication. The highest level at which it is safe to inject alcohol into the subarachnoid space is the seventh cervical interspace and here the maximum safe dosage is 10 M."

In order to better govern the effect, Russell[9] advocates the procedure of injecting small amounts of alcohol, waiting 10 - 14 days for the effect, and then injecting larger amounts. In case multiple injections on the same side or bilateral injections are necessary for relief, one should wait at least 10 days before reinjecting[10].

The procedure of performing a cordotomy and an alcohol injection on the same side of the cord has been carried out at the University Hospitals in two patients. The cordotomy relieves pain on the contralateral side while the alcohol relieves it on the ipsilateral side. This procedure should have the advantage of fewer complications of urinary and fecal incontinence and loss of sexual power than bilateral cordotomy, but as yet the procedure has not been used extensively enough to determine its true value.

The indications for subarachnoid alcohol injections are numerous. In this clinic we have limited the indications to persons with hopeless malignancy while in other clinics persons with intractable pain from various other causes have been treated.

Chart 1

Cause of Pain in 223 Cases from the Literature

Malignant lesions	
Carcinoma of prostate	19
Carcinoma of cervix	62
Carcinoma of corpus uteri	4
Carcinoma of large intestine	28
Carcinoma of bladder	12
Carcinoma of lung	2
Carcinoma of ovary	1
Carcinoma of vulva	3
Carcinoma of stomach	2
Carcinoma of penis	1
Metastatic tumors	14
Spinal cord tumors	3
Testicular tumors	1
Malignant tumors of pelvis and leg bones	8
Lymphoblastoma inguinal region	1
	161

Non-malignant lesions	
Genitourinary infections	6
Pruritis ani and vulvae	2
Arthritis	7
Syphilitic crises	1
Neuralgia - sciatica	46
diabetic	
ischemic	62
radiculitis	
herpes zoster	

Cases of tabetic crises have been included in most series and some have confined treatment to such cases. In those persons who have become addicted as

a result of taking morphine for the relief of intractable pain, Lichtenstein and Greene[11] have used Dogliotti's technique of injecting 95% alcohol around roots ennervating painful areas and then giving the usual psychiatric care for addiction. Good results in the treatment of pain due to herpes zoster has been stated[12] to be due both to the relief of pain and to the direct action of the alcohol on the virus.

Poor results may be due to a number of causes, the two most common are: 1. misjudging the proper site for injection; and 2. selecting patients with pain arising from visceral organs. The pain fibers from visceral organs pass with the autonomic nervous system to cord segments cephalad to the roots treated with alcohol. Pain arising from infectious processes[10] seems not to be greatly influenced by subarachnoid alcohol since infections usually involve several cord segments and the effect of alcohol is limited at most to a few segments.

In our series of 59 cases all but one have been for intractable pain due to carcinoma. Fifteen patients had carcinoma of the cervix, ten had carcinoma of the prostate, seven had carcinoma of the bladder, and eight had carcinoma of some part of the large bowel with extension into the surrounding tissues. Ten injections were done for metastatic tumors to the bones of the spine or pelvis, the primary tumor arising in the breast in two cases, in the lung in two, salivary gland in one, lower leg in one, and generalized metastatic tumor in three cases. One patient had a post irradiation neuritis.

Chart 2

Cause of Pain in Patients Injected at University of Minnesota (59 cases)

Carcinoma of prostate	10
Carcinoma of cervix	15
Carcinoma of bladder	7
Carcinoma of rectosigmoid	8
Carcinoma of corpus uteri	2
Metastasis to bones of spine or pelvis	10
Mixed tumor salivary glands	1
Myxoma of leg	1
Malignant melanoma	1
Hodgkin's disease	1
Carcinoma of penis	1
Multiple myeloma	1
Endothelioma of pleura	1
Carcinoma of lung	1
Carcinoma of breast	2
Osteogenic sarcoma of ilium or femur	2
Middledorf tumor of sacrum	1
Fascial sarcoma of thigh	1
Malignant embryoma testicle	1
Carcinoma of anterior vaginal wall	1
Post irradiation neuritis	1

We have been able to follow in the outpatient clinic or by correspondence all of the 59 patients injected. Forty six have expired since injection which is not surprising since they were done for relief of pain in hopeless malignancy

In our series there were 34 men and 25 women. The average age was 56 years.

Chart 3

Average Age of Patients at Time of Alcohol Injection

McKenna and Oldberg	48 years
Russell	62 years
Adson	49 years
Stern	50 years
University Hospitals	56 years

The average length of life after alcohol injection in those known to be dead was 231 days. The longest single period of relief, 5 years, was obtained in a woman with carcinoma of the cervix with intractable pain in the sacral region. It is assumed that the pain here was not due to recurrence since she has survived more than five years. It may be that she had a self limited pain.

The evaluation of results in the relief of pain is difficult, especially when there is partial relief because of the individual variations in thresholds of pain and psychic factors in the patient. We have therefore made our classification as objective as possible. Results were classified as complete only if relief was obtained and persisted until death or for two months following the injection, partial if there was persistence of some pain but to a lesser degree either until death or for two months, none if the pain recurred within two months or if no relief were obtained at any time,

Chart 4

Author	No. of Cases	Bilateral	Unilateral	Repeated Injections
Goff	20	5%	95%	5%
Greenhill Schmitz	25	8%	92%	10%
Abbott	25	16%	84%	16%
McKenna-Oldberg	8	0	100%	12%
W. Ritchie Russell	18	0	100%	11%
Adson	40	0	100%	3% to 6%
Stern	19	20%	80%	0
University Hospitals	59	14%	86%	19%
Total	214	7%	92%	10%

In our series there were eight bilateral injections and eleven repeated injections so that there was a total of 78 injections given to 59 patients. Of these 78 injections, 37 or 49% gave complete relief, 16 or 21% gave partial, and 21, or 29%, gave no relief. However, since some patients received repeated injections and obtained relief with the second or third injection, the number of patients relieved was greater than the above percentages indicate. Thirty-six patients, or 61%, had complete relief, 16 patients, or 27%, had partial relief, and seven patients, or 12%, no relief.

Chart 5

Relief

Author	No. Cases	Reinjected	Complete	Partial	None
McKenna & Oldberg	8	1	75%	12.5%	12.5%
Goff	20	1	100%	0	0
Russell	16	2	55%	22%	22%
Greenhill Schmitz	25	2	80%	12%	8%
Adson	40	0	40%	30%	30%
Abbott	25	10	84%	8%	8%
Stern	19	0	70%	20%	10%
Saltzstein	11	1	72%	18%	10%
Dogliotti	150	?	50%	30%	20%
University Hospitals	59	11	61%	27%	12%
Total	373	28	69%	18%	13%

Chart 6

Complications Following Alcohol Injection

	McKenna Oldberg	Goff	Stern	Adson	Russell	Greenhill Schmitz	Abbott	Saltz-stein	Dogliotti	Univ. Hosps.	Total
No. of Cases	8	20	19	40	16	25	25	11	150	59	373
Temp. urinary fecal incontinence	1	9	2	2	4	3		1		4	26
Permanent " "										1	1
Temporary Paresis				1	2	1	2	6		6	18
Permanent Paresis	1									1	2
Unusual sensory change		1				12				1	14
Atrophy leg						1				1	2
Abdominal distention								1			1
Headache									90		90

Complications following alcohol injections are not recorded in detail in the literature. In our series there were five patients with urinary or fecal incontinence following injection. Of these, four became continent within a few days while one remained incontinent for a month. There were seven patients with paresis or paralysis of an extremity following injection. Of these, five noted normal strength within a week while two were paralyzed for about two months. However, one of these had a metastatic lesion to his pelvis and femur and noted paresis before injection. One patient noted a girdle sensation following injection and one noted an atrophy of the leg on the side injected; however, this latter patient was bedridden both before and after injection.

We have been able to obtain at autopsy the spinal cords of five individuals who had alcohol injections. The interval from the time of injection to death varied from three to six months. The histological changes were found to be fundamentally similar in all cords, varying only in degree of spinal cord involvement. Sections of the cords were made from the cauda equina to the upper cervical segments. The study revealed a unilateral destruction of the posterior rootlets and of the lateral part of the posterior funiculus. The posterior rootlets showed a patchy demyelinization. Only occasionally was diffuse involvement of an entire rootlet observed and even in these cases there were normal fibers intermixed with the partially and the completely destroyed tissue. In the cord itself there was invariably a unilateral destruction of the long ascending fibers in the posterior funiculus as well as the fibers in the dorsolateral fasiculus of Lissauer. In one of the cords there was a mild destruction of the lateral spinothalamic tract on the contralateral side. This was present for 2 or 3 vertebral levels and at a higher level seemed to fade out and was not detectable. In the interpretation of these findings, one must keep in mind that the fibers carrying pain and temperature pass through the dorsal root, through the fasiculus dorsolateralis of Lissauer and terminate in the substantia gelatinosa Rolandi so therefore destruction can be expected to continue in a central direction only as far as the rolandic substance. However, the fibers carrying light touch and deep sensibility pass up the dorsal funiculus to terminate in the nucleus gracilis and cuneatus and can therefore be expected to show destructive changes up to these nuclei.

In the one cord in which there was minimal destruction of the fibers of the lateral spinothalamic tract of the contralateral side, the best interpretation seems to be that part of the alcohol penetrated the cord and caused destruction of some of the posterior horn cells.

These histologic changes somewhat substantiate the theories of Muller-Lugaro that only part of the total fibers need to be destroyed for pain relief.

Rhizotomy

The next most simple procedure for the relief of pain is rhizotomy. Dana was the first to propose section of the posterior roots for relief of pain and Bennett in 1886 and Abbe in 1888 actually divided roots.

Rhizotomy is most often done in the cervical and thoracic levels and consists of doing a laminectomy, opening the dura and arachnoid, identifying the rootlets to be cut, elevating them and separating them from the posterior radicular artery which comes into the cord along each root, and then cutting the roots. The roots may be either cut or crushed. The dura is then closed and the wound sutured.

Rhizotomy is not as versatile a procedure as was first presumed because its sequellae and complications limit its use. While nerve root neuralgias, as from bony or inflammatory pressure, are relieved, pains from peripheral lesions are not so readily relieved[13]. The reason for this is the wide anastomosis of peripheral nerves - one segmental nerve overlaps the nerves on each side of it. Therefore, to relieve pain in one segment it is necessary to cut the nerve above and the nerve below as well as the seg-

mental nerve. In malignant lesions pain usually is over a large area and so one must do a wide laminectomy and cut many roots. This greatly weakens the vertebra structurally. It also causes a complete anaesthesia in addition to analgesia over a large area. Pain and temperature loss which follows cordotomy causes no serious inconveniences but when there is the additional loss of touch and position, it is a definite handicap. To overcome this anaesthesia it has been postulated[14] that one should leave every third nerve - this prevents complete loss of sensation; however, it does not completely abolish pain. Bladder and rectal incontinence as well as paralysis of extremities may occur if the motor nerves to these organs are cut. In the region of the lumbar and sacral part of the spinal canal it is difficult to identify the posterior from anterior roots if they are exposed at their exit from the spinal canal, but if they are exposed at their exit from the cord, the posterior roots can be easily separated from the anterior; however, the cord segment from whence they arise cannot be accurately determined. It is because of the latter two complications that the practical use of rhizotomy is limited to the cervical and thoracic regions. Frazier[15] has obtained good results with rhizotomy in the treatment of tabetic crises while other authors[16] have used rhizotomy together with cordotomy for relief of this type of pain.

Chart 6

Tractotomies Done at University Hospitals

Age, Sex	Diagnosis	Treatment	Result
47 M	Ca. of salivary gland	Tractotomy V on left Rhizotomy C_5-C_4 bilat.	Complete
66 M	Ca. cheek with metastasis to mandible	Tractotomy V Rhizotomy C_5-C_3	Complete
48 M	Ca. of tongue and alveolar process	Tractotomy V Rhizotomy C_1-C_3	Complete
53 M	Ca. alveolar process	Tractotomy V Rhizotomy IX " C_1-C_3	Complete
69F	Ca. antrum with extension to orbit	Tractotomy V	Complete

Chart 7

Rhizotomies Done at University Hospitals

Age,Sex	Diagnosis	Treatment	Result
76 M	Ca. mouth with recurrence in neck	$C_1 - C_4$	Complete
46 F	Compression fracture intercostal neuralgia	$T_5 - T_{10}$	Complete 2 mo. partial since
57 M	Amputation neuroma	$C_7 - C_8$ T_1	Complete
27 M	Amputation neuroma	$C_5 - C_8$ T_1	Unknown
56 F	Ca. antrum with extension into orbit	V	Complete

In our series there are 9 cases of rhizotomy. They were all done for fairly localized intractable pain where alcohol injection or cordotomy were inadvisable due to the site of the pain. Five were for carcinoma of the face or tongue, two were for amputation neuroma, one was for carcinoma of the antrum, and one for intercostal neuralgia probably arising secondarily to a compression fracture.

We have been able to follow all the patients except one.

Seven of the eight patients followed obtained complete relief while one noted recurrence of some pain after 2 months.

No complications other than anaesthesia over the involved area was noted. One patient expired 8 days after he was discharged from the hospital.

Rhizotomy of the posterior roots of the V and the IX cranial nerves for neuralgia is not included in the above discussion. We have performed rhizotomies of the V cranial nerve for major trigeminal neuralgia in 33 patients and rhizotomy of the IXth cranial nerve for glossopharyngeal neuralgia in 2 patients since July, 1937. We have been unable to follow one patient. Four patients obtained partial relief while thirty noted complete relief.

Tractotomy

Tractotomy of the Vth nerve was first described in 1938 by Sjoquist[17] and consists of sectioning the descending roots of the Vth nerve in the medulla. This cuts pain and temperature fibers and leaves light touch intact. The corneal reflex is lost since the cornea contains only pain fibers.

Tractotomy of the Vth nerve has been performed here five times. Four of the five patients had rhizotomies in addition to the tractotomy.

All of the patients upon whom tractotomies were performed obtained complete relief. They were able to be up and around in 4 - 5 days following tractotomy.

The only complication noted was, in one patient, a temporary ataxia that disappeared after 2 weeks.

Cordotomy

In 1879 Gowers[18] suggested that pain and temperature fibers passed upward

within the cord in Gower's tract, a fact which Van Gehuchten asserted positively in 1893. However, in 1905[19] Spiller described the case history of an individual in which there was loss of pain and temperature sensation but preservation of light tough. Post mortem findings revealed bilateral tubercles located in the spinothalamic tracts so he concluded that pain and temperature fibers were contained in the spinothalamic tracts but that no other important tracts including the fibers of light touch were located in this region. The first cordotomy was done in 1911 by Martin at the request of Spiller[20]. It was performed on a patient, age 47, with a malignant spinal cord tumor causing severe pain. It was done bilaterally and the result was good. In 1912 Beer[21] performed the second cordotomy. It was done at the tenth thoracic level and gave complete analgesia up to the pubes. The procedure was later carried out by Tietze at Foerster's suggestion and also by Elsberg, but it did not attract the attention it deserves until Frazier[22] in 1920 published his series of 6 cases. Of these 6 cases, all had good relief except one and that was partial.

Cadwalader and Sweet[23] in 1912 sectioned the anterolateral columns in dogs and noted that in addition to the loss of the cutaneous sensation of pain and temperature, a pronounced ataxia occurred. This ataxia was attributed to the injury of Gower's tract and Cadwalader looked upon this as a pseudoparalysis rather than a true paralytic ataxia. He postulated that the sensory impulses that should pass through Gower's tract had been cut off and it was necessary for the remaining sensory tracts to compensate for the cut tract. When compensation was adequate the pseudoparalysis disappeared. These experiments, along with the findings of Spiller[19], made numerous investigators, especially Frazier[24], believe that the fibers of pain and temperature were situated interiorly to the more superficial Gower's tract. Foerster sectioned the cord under local anaesthesia, tested for lost sensation, and then extended the incision and tested again. In this way he was able to plot out areas of lost cutaneous sensation in relationship to the area of cord sectioned. He concluded that the spinothalamic tract extended from the dentate ligament and that the fibers from the lower segments were located more superficially than those from higher segments. Hyndman[25] in 1939 used this same technique and found that immediately anterior to the dentate ligament there was an area that produced no demonstrable change when it was cut and so concluded that the spinothalamic tract did not extend as far posteriorly as the dentate ligament. He also concluded that the segmental pattern of the fibers was not as found by Foerster but that the upper segments were more anteriorly placed than the lower segments.

Numerous observers have found that areas of pain and temperature loss in spinal cord tumors and cordotomies frequently do not coincide. This dissociation of pain from temperature fibers has been the basis of hope that a differential section of the spinothalamic tract will be possible[26]. It is upon this spatial dissociation of pain and temperature from touch and motor fibers that the procedure of cordotomy is based.

The procedure of cordotomy as performed at the University Hospitals, and as now advocated by most neurosurgeons, is to cut the cord at about the level of the third thoracic vertebra by inserting a knife anterior to the dentate ligament and sweeping the blade forward to emerge anterior to the exit of the anterior roots. The cut is made approximately 4 millimeters deep. This causes loss of pain and temperature sensation on the entire opposite side of the body up to one or two cord segments below the cordotomy. Whenever one gets "pain spots" amid areas of analgesia, one probably has incomplete section. Also if section is incomplete in an anteroposterior direction, the level of loss of pain may retract toward the area of permanent loss in a week or so after the operation, i.e., if one leaves the anterior fibers it retracts downward while if one leaves the posterior fibers, sensation reappears in the feet and spreads upward. The greatest area of analgesia following cordotomy was obtained by Foerster[27] with a section at the second cervical level

with analgesia to above the clavicle. However, it is usually considered inadvisable to perform a cordotomy at this high level because of fear of respiratory paralysis.

The indication for cordotomy is severe intractable pain. Neoplastic lesions are the most common indications; however, cordotomy has been done for tabetic crises, thalamic pains, neuralgias, and infectious lesions causing pain. The following indications have been recorded by a group of eight authors; there are, of course, innumerable other causes of pain suitable for relief by cordotomy.

Chart 8

Indications for Cordotomy in 129 Cases from the Literature

Malignant	
Carcinoma of Prostate	3
Carcinoma of Cervix	12
Carcinoma of Bladder	20
Carcinoma of corpus uteri	1
Carcinoma of large intestine	10
Retroperitoneal malignancies	3
Renal tumors	1
Primary spinal cord tumors	13
Sarcoma of leg or pelvis	7
Metastatic tumors to spine or pelvis	9
	79

Non-Malignant	
Syphilis - crises	24
Spinal cord injuries	9
Neuralgias	11
Arachnoiditis	2
Hunner's ulcer	1
Interstitial cystitis	1
Herpes zoster	1
Arthritis	1
	50

Chart 9

Cause of Pain

	Horrax	Peet	Collected Cases (Peet)	Frazier Spiller	Grant	Hyndman	Kahn	University Hospitals	Total
No. of Cases	8	19	19	8	48	6	12	16	88
Ca. prostate		2						1	3
Ca. cervix		9						2	11
Ca. corpus uteri			1						1
Ca. bladder					18			2	20
Ca. large intestine			3	2		1		4	10
Syphilis Crises	5		3	0	2	2	12	0	24
Metastatic Tumors		3	1	1	0	2		2	9
Primary cord tumors	1		3	1	8				13
Renal tumors	1								1
Arthritis	1								1
Sarcoma leg or pelvis		2	1		4				7
Neuralgia		2	2	2	2	1		2	11
Retroperitoneal malig.		1			2				3
Spinal cord injuries			5		4				9
Hunner's ulcers				1					1
Interstitial cystitis								1	1
Arachnoiditis				1				1	2
Post herpetic								1	1

Pains thought to be unilateral often prove to be bilateral following relief on one side; the more severe pain apparently overshadows the lesser but still intolerable pain on the opposite side. Therefore patients must be carefully scrutinized before procedures for relief are attempted.

It is difficult to understand how a cordotomy will prevent thalamic pains - the reason, most likely, is that a peripheral stimulus is indispensable for the production of central pain. In the presence of a thalamic lesion, a peripheral stimulus, normally subliminal, enters consciousness as pain. The number of fibers that one needs to cut for relief in thalamic pain is probably dependent on the severity and extent of the pain[28].

Complications occur most often following bilateral cordotomies. This is especially true for retention of urine and feces and the diminution or loss of sexual ability. Motor paresis and paralyses, if they occur and persist, are serious. Occasionally following a cordotomy there will be noticed a weakness of an extremity that clears up in 2-5 days. These complications are probably due to local edema of the cord or to section of the extra pyramidal fibers so causing the pseudoparalysis of Cadwalader, or to injury to the crossed pyramidal tracts[29]. Trophic changes in the form of bed sores have been reported; girdle pains are probably due to root irritation and usually disappear after 10-14 days. There is a feeling of numbness in the leg that usually is not, but may be, annoying to the patient. We have seen patients returning 1-2 years following cordotomy stating that numbness is their only complaint. Due to the loss of temperature sense, these people must be warned of the danger of burning or freezing their feet.

At the University Hospitals we have performed 16 cordotomies - eight women and eight men. Five were bilateral (Chart 10). We have been able to follow all of the 16 cases. Since cordotomy seven have expired and nine are being followed in the outpatient department. The average age is 53 years (Chart 11). Some type of carcinoma was the cause of pain in eleven cases.

Chart 10

Cordotomies

Author	No. Cases	Bilateral	Unilateral
Horrax	8	6	2
Peet	19	17	2
Collected Cases (Peet)	19	13	6
Frazier-Spiller	8	5	3
Hyndman	6	2	4
Kahn Barney	12	0	12
Grant	48	26	22
University Hospitals	16	5	11

Chart 11

Average Age

Frazier-Spiller	40 years
Hyndman	46 "
Kahn Barney	46 "
Grant	47 "
University Hospitals	53 "

There were four patients with carcinoma of rectum or rectosigmoid with extension into surrounding tissues or metastasis to the pelvic bones, two patients had carcinoma of the cervix with metastases; metastatic carcinoma from the breast, bladder, penis, and prostate were also represented. In one patient there was carcinoma of the breast that had spread to involve the brachial plexus a cordotomy at the third cervical vertebral level was done with analgesia up to the first thoracic level - relief was complete. One woman had symptoms of pain down her right leg, the etiology of which was probable arachnoiditis. She had complete relief following cordotomy but since then has experiences a girdle sensation around the chest at level of C_4. One patient had diffuse Hodgkin's

disease with intolerable pain in legs, hips, and lower abdomen. There were two individuals with neuritic pains, one post herpetic and the other sciatic. One patient had interstitial cystitis with suprapubic pain.

Chart 12

Cause of Pain in 16 Cordotomies
(University Hospitals)

Carcinoma of prostate with metastasis		1
Carcinoma of cervix with metastasis		2
Carcinoma of bladder with metastasis		1
Carcinoma of large intestine with extension		4
Carcinoma of breast with metastasis		1
Carcinoma of breast with involvement of brachial plexus		1
Carcinoma of penis with metastasis		1
Neuritis		2
Post herpetic	1	
Sciatic	1	
Interstitial cystitis		1
Arachnoiditis		1
Hodgkin's disease		1

The results have been very satisfactory. Relief was called complete if there was no pain when least seen in the outpatient clinic or until death. relief was called partial if there was diminution of pain for the same periods of time. In our series of 16 patients, relief was complete in 13 and partial in 3. Of these three with partial relief, one had complete relief for nine weeks before the return of some pain and another had almost complete relief except for an occasional sharp pain in the otherwise analgesic area.

Chart 13

Relief

Author	No. Cases	No.Reoperated	Complete	Partial	None
Horrax	8	0	75%	25%	0
Peet	19	3	80%	15%	5%
Collected cases (Peet)	19	0	72%	28%	0
Frazier-Spiller	8	1	75%	12.5%	12.5%
Hyndman	6	0	100%	0	0
Kahn Barney	12	1	82%	9%	9%
Grant	48	3	76%	20%	4%
University Hospitals	16	2	81%	19%	0
Total	136	10	80%	16%	4%

Complications in our series were similar to those recorded in the literature. Two patients had girdle sensations - permanent in one but lasting only two weeks in the other. They are probably due to rootlet irritation. Two patients had urinary incontinence lasting three weeks; two patients had temporary motor paresis lasting 48 hours. We have not been able to determine whether any change in sexual potency has taken place. One patient expired immediately following cordotomy. His general preoperative health was very poor and death was due to vasomotor collapse. One patient expired 19 days postoperatively from general debility and pneumonia.

Chart 14

Complications in 136 Cases

Complication	Horrax	Peet	Collected Cases (Peet)	Kahn	Grant	Frazier Spiller	Hyndman	University Hospitals	Total
Temp. bladder rectal incontinence	2	5	2	2		1	2	2	16
Perm. bladder rectal incontinence	1	1	0	10					2
Temp. paresis (48 hours)		3	1	1		2		2	9
Temp. paralysis		1		7					1
Girdle pains						2		2	4
Distention					4				4
Vomiting					5				5
Death					7				7
Total	3	10	3	3	33	5	2	6	65
Percentage of all cases	38%	50%	15%	25%	66%	62%	33%	37%	48%

Cordotomies

Age, Sex	Diagnosis	Site of Pain	Site of Cordotomy	Result	Complications
43 M	Ca. prostate with pelvic metas.	Sacral region	T3 bilateral 3-14-40	Complete T9 9 weeks then partial	Girdle sensation for 3 weeks, last seen 12-15-40
78 F	Ca. breast with pelvis metas.	Lower abdomen & thigh	T3 6-6-40	Complete T8	None, death 12-3-40
64 F	Ca. breast with involvement brachial plexis	Hand and arm	C3 12-4-39	Complete T1	None, death 4-21-40
65 F	Hodgkin's disease	Lower abdomen, hips, legs	Bilateral 6-25-40	T3 Partial T8	Urinary incontinence 2 weeks, last seen 1-18-41
65 M	Ca. rectum with extension	Sacrum & buttock	T3 bilat. 10-4-40	Complete T11	Alcohol injection lt. L3-4-29-40 Alc.Inj.Lt. L3-10-9-40
33 F	Ca. cervix with pelvic metas.	Pelvis & legs	T3 bilat. 9-16-37	Complete T8	Temporary paresis legs 24 hours Death 10-4-37
50 F	Ca. cervix with pelvic infil.	Hip & leg	T3 5-18-40	Complete T7	None Death 6-30-40
31 F	Arachnoiditis?	Leg	T3 10-7-39	Complete T4	Girdle pain - last seen 1-15-41
54 M	Ca. penis with inguinal metas.	Leg & hip	T3 3-25-40	Complete T6	None. Death 4-13-40 Hospital death
72 M	Ca. bladder with pelvic metas.	Leg & hip	T3 8-4-40	Complete T8	None. alcohol injection on same side 8-12-40 Death 11-15-40
61 M	Ca. rectum with extension	Sacral	T3 7-3-37	Complete T5	None Death 8-2-37
40 M	Ca. rectosigmoid with extension	Sacral	T3 5-22-39	Complete T5	None, last seen 1-15-41
61 M	Post herpetic	T6-9	T3 7-16-41	Complete T5	In spite of complete anaesthesia to T5, complained of occasional sharp pain T7, last seen 1-15-41.
38 F	Neuritis	Leg	T3- 5-3-40	Complete T8	None, last seen 1-15-41

Cordotomies (Cont.)

Age, Sex	Diagnosis	Site of Pain	Site of Cordotomy	Result	Complications
59 F	Ca. rectum with metastasis	Leg & sacrum	RT4 11-21-39 T3 bilat. T5 12-10-40	Partial Complete T5	Paresis Rt. leg 48 hrs. Last seen 2-4-41
57 M	Interstitial cystitis	Supra-pubic	RT2; LT4 4-20-40	Complete	None, last seen 11-7-40

Alcohol Injection

Age, Sex	Diagnosis	Site of Pain	Site & time of Injection	Amt.	Complications	Relief
69 F	Hodgkin's disease with spine involvement	Lt.hip & leg	10-3-39 lt Ll	1 cc.	Paresis leg 48 hrs., urinary incontinence 48 hrs.	Partial to death 3-15-40
54 M	Ca. penis with metastasis	Lt.leg & hip	2-24-40 Lt. Ll	1 cc.	None	Partial - later cordotomy 3-25-40 death 4-13-40
33 F	Ca. cervix with metastasis	Pelvis & legs	6-30-27 Rt. T11 7-9-37 Lt. T11	1 cc. 1 cc.	None	Complete t death. Complete 1 wk. then cordotomy 9-16-37, death 10-4-37
72 M	Ca. bladder with metastasis	L.leg & hip R.leg & hip	8-12-40 Rt.L2	1cc.	None	Complete Had previous cordotomy on same side (death 11-15-40)
67 M	Multiple Myeloma of whole skeleton	L.chest,hip, leg	6-20-40Lt.T9	1 cc.	None	Complete t 6-25-40, partial thereafter
62 M	Ca. rectum with metastasis	L. leg	10-6-36 Lt.L3	2 cc.	None	Complete t death 8-22-37
24 M	Endothelium pleura with metastasis to spine	Sacral & lt. thigh	3-2-35 Lt.L4 4-1-35 Lt.L4	.7 cc. .5 cc.	None None	Complete 2 weeks Complete 1 week-death 6-11-35
58 M	Ca. bladder with metastasis	Pelvis	8-1-35 Rt.L3 8-7-35 Lt.L3	.7 cc .7 cc.	None None	Complete 36 hrs. Death- 12-19-35
61 M	Ca. rectum	Sacral	2-19-36 Rt.L3	.8 cc.	Paresis rt. foot 48 hrs.	Complete to death 7-15-36

Alcohol Injection (Cont.)

Age, Sex	Diagnosis	Site of Pain	Site & time of Injection	Amt.	Complications	Relief
62 M	Ca. prostate with metastasis		4-7-36 Lt.T12 4-18-36 Rt.T12 6-7-36 Rt.L2	.8 cc. .8) .8)	None Urinary incontinence 24 hr.	Complete to death 1-17-37 None
61 M	Ca. rectum with extension	Sacral	1-5-37 Lt.L4 1-16-37 Lt.L4	1 cc. 2 cc.	None None	None) had cor- None) dotomy 7-3-37 Death 8-2-37
65 F	Ca. rectum with metastasis	L. thigh & pelvis	3-17-38 Lt.L5	1 cc.	None	Complete, last seen 12-14-38 Death 2-15-39
40 F	Ca. cervix with metastasis	R. hip & thigh	5-31-38 Rt. T12	1cc.	None	Complete 2 days Death 10-21-38
38 F	Ca. cervix	L.sacro-iliac joint	11-25-35 Lt.L3 1-21-35 Lt.L3	.5cc. .8cc.	None	None, complete to death 6-13-36
80 M	Ca. bladder	Supra-pubic	7-10-35 Rt.T12	.5 cc.	None	Complete 2 mo. Death 11-17-35
71 M	Ca, bladder with extension	L.but-tock & thigh	2-11-35 Lt.L3	.5 cc.	None	Partial until death 3-5-35
65 M	Ca. prostate with metastasis	L.but-tock & thigh	1-22-35 Lt. L3 8-15-35 Lt. L3	.5 cc. .5 cc.	None None	Complete 1 wk. Complete to death 5-25-36
76 M	Ca. bladder with extension	Supra-pubic	4-9-35 Lt.T12	.7 cc.	None	Complete to death 9-30-35
57 M	Ca. prostate with metastasis	Lt. leg	2-16-35 Lt.L3	.5 cc.	None	Complete 6 days partial 3 mo. death 10-10-35
48 M	Ca.lung with metastasis to femur	Rt.leg	4-26- 35 Rt.L3	1 cc.	Urine & feces incontinent 1 mo. Paresis r.leg 2 mo.	Complete to 6-4-35 then partial. Last seen 6-12-35
60 F	Middledorf tumor sacrum	Lumbar & gluteal spaces	5-12-35 Rt.L4 5-18-35 Rt.L4	.5 cc. .5 cc.	None	Complete 9 mo. Death 7-2-37
80 M	Ca. prostate with metastases	Rt. leg & hip	10-24-40 R. L2	1 cc.	None	Complete on r. Last seen 12-6-40
75 M	Ca. prostate with metastases	Lt.inqui-nal region	11-15-35 Lt. L3	.5 cc.	None except questionable atrophy of leg.	Complete 1 wk. Partial to death 10-26-37
70 M	Ca. prostate with metastases	Lt. hip & leg	9-30-35 Lt. L3	.6 cc.	None	Partial (50%) until 3-25-35

Alcohol Injections (Cont.)

Age, Sex	Diagnosis	Site of Pain	Site & time of Injection	Amt.	Complications	Relief
59 M	Fascial sarcoma left thigh	Lt.leg	6-21-36 Lt.T10	.8 cc.	None	Partial, death 1-15-37
75 M	Ca. prostate with metastasis	Bilat. sacral & hips	3-20-35 Rt.L1	.7 cc.	Paresis leg 48 hrs.	Complete 2 yrs. Death 11-15-37
62 M	Ca. bladder with extension	Both hips & legs	4-21-38 Rt.L1 4-29-38 Lt.L1	1 cc. 1 cc.	Absent knee & ankle jerks	Complete to death 24 hrs.
57 M	Ca. bladder with extension	Perineum & both hips	6-12-39 Rt. T12	1cc.	None	Partial)to Complete)death 3-4-40
47 F	Ca. cervix with pelvis metas.	Lumbar regions & leg	10-23-35 Rt L4 11-2-35 Rt L3	.7 cc. .5 cc.	None	Partial (50%) until death 4-20-37
70 M	Ca. prostate with metastasis	Thigh	2-20-38 Lt.L2	1 cc.	Weakness of leg before & after injection	Complete to death 9-12-38
64 M	Suspected Sarcoma lt. femur	Femur	10-21-36 Lt.L3 10-27-36 Lt.L1	1 cc. 1.5cc.	Temporary paralysis 48 hrs.	Partial to death 11-6-39
49 F	Ca. cervix with local extension	Lumbar spine & pelvis	7-2-37 Lt. L1	1 cc.	None	Complete to death 1-13-39
30 M	Malig.embryoma Rt. testicle	Leg	7-27-37 Lt.L1	1 cc.	None	Partial to death 7-30-37
59 F	Ca. rectum with metastasis	Leg & sacrum	5-3-39 Rt. L4 6-14-39 Lt. L4	1 cc. 1 cc.	None	Complete 3 mo. then bilat. cordotomy 12-10-40, last seen 2-4-41
77 M	Ca. prostate with metastasis	Hip & sacrum	3-30-38 Lt.L5	1 cc.	None	Complete to death 7-7-38
47 M	Mixed tumor salivary gland with metastasis	Rt. leg	12-21-35 Rt.L2	.75 cc.	None	Complete to 1-15-36. Death 2-15-36
49 F	Ca. Cervix	Pelvis & R.leg	2-11-35 Rt.L4 2-15-35 Lt.L4	.5cc. .5cc.	Paresis rt. leg 24 hrs.	Complete to death 3-2-35
35 F	Ca. breast with metastasis to femur	Upper 1/3 thigh	8-24-35 Rt. L2	.4cc.	None	Complete 2 mo. Partial to death 12-3-35
40 M	Ca. rectosigmoid with extension	Sacral	4-17-39 Lt.L2	1 cc.	None	None- had cordotomy 5-22-39, last seen 1-15-41
68 M	Ca. rectum with metastasis	Lt. hip & leg	7-20-38 Lt.L1 8-11-38 Lt.L4	1 cc. 1 cc.	None	Complete 8 hrs. then none. Death 9-15-38

Alcohol Injections (Cont.)

Age, Sex	Diagnosis	Site of Pain	Site & time of Injection	Amt.	Complications	Relief
33 F	Ca. cervix with metastasis	Sacral & both legs	6-30-37 Rt.T11 7-9-37 Lt.T11	1 cc. 1 cc.	None	2 weeks, relief cordotomy 9-16-37, death 10-4-37
51 M	Myxoma leg with spinal metas.	Spine & leg	2-17-35 Lt.T12	.5 cc.	None	Partial to death 6-9-35
38 F	Ca. cervix with metastasis	R.hip & leg	3-16-35 Rt.L4	.7 cc.	Urinary incontinence 24 hrs.	Complete last seen 1-15-41
34 M	Malig.melanoma with metastasis	Rt. leg & thigh	1-18-35 Rt.L3	.5 cc.	None	Complete 2 mo. then partial 5½ mo. to death 6-6-35
48 F	Ca. cervix with metastasis	Rt.leg & foot	9-11-35 Rt.L3	.7 cc.	None	Complete to death 9-20-35
57 M	Ca. prostate	L.buttock	4-19-38 Lt.L1	1 cc.	None	Complete to death 3-19-39
51 M	Ca. rectosigmoid	Back & hips	7-25-39 Rt.T12	1 cc.	None	Complete to death 8-22-39
48 F	Ca. corpus uteri	Pelvis & leg	9-27-35 Lt.L3	.6 cc.	Temp.fecal incontinence 7 days	Partial to death 1-2-36
64 F	Ca. cervix	Both hips & legs	5-18-36 Lt.T11	.84cc.	None	Complete on lt. to death 7-2-36
60 F	Ca. cervix	Rt.hip & inguinal reg.	1-20-41 Rt.L1	1 cc.	None	Complete to present, last seen 2-10-41
72 M	Osteogenic sarcoma lt. ilium	Lt. hip	1-18-34 Lt.L3	.5 cc.	None	Complete to death 8-15-35, later had pain in rt. side.
29 F	Ca. cervix with metastasis	Rt. leg	5-28-35 Rt.L3 6-8-35 Rt. L3 8-10-35 Rt.T10	.6cc. .6cc. .7cc.	None None None	Partial Partial Complete to death 12-15-35
23 F	Ca. anterior vaginal wall	Rt.lower quadrant of abdomen	1-15-36 Rt.T12	1 cc.	None	Complete to death 10-15-36
66 F	Ca. cervix	Rt.hip	4-28-39 Rt. L3	1 cc.	None	Complete to death 8-17-39

Alcohol Injections (Cont.)

Age, Sex	Diagnosis	Site of Pain	Site & time of Injection	Amt.	Complications	Relief
46 F	Ca. breast with metastasis	Lt. T2 inter-space	12-4-38 Lt.T4	1 cc.	Slight girdle sensation 7 days	Complete 2½ mo. Death 7-15-39
27 F	Ca. cervix post irradiation neuritis	Lt. leg & hip	12-2-40 Lt.L4	1 cc.	None	Complete last seen 1-2-41
43 F	Ca. cervix	Lt. lumbar & hip	6-14-40 Lt.L2	1 cc.	None	Partial to death 8-12-40
54 F	Ca. cervix	Rt. hip	1-28-41 Rt.L1	1 cc.	None	Immediate, complete, to be followed.

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V. GOSSIP

Our dental hygienist, Miss Gormican, has scored again with a splendid exhibit at the Annual Meeting of the Minnesota State Dental Association in the Minneapolis Auditorium. Last year she had her famous tooth brush tree which was decorated with brushes brought by patients who responded to our invitation to them to bring their tooth brush. This year she has a health circus which in many respects is a more finished job than last years. As usual, the exhibit is attracting a great deal of attention....There is another exhibit there by a dentist who believes that dentists offend a great deal by foul breath. He has a gadget which he wears over his mouth in order to keep from offending his patients. An interesting explanation is made by him in regard to the way he handled the situation before he devised the gadget. He says he used to hold his breath while working on patients. If it took too long he would turn aside and pretend he was picking up something off the table....The Minnesota Society for the Control of Cancer, an affiliated group of the American Society for the Control of Cancer, will visit the Cancer Institute of the University Hospitals, Wednesday, March 12, at 4:00 p.m., to view our radiation department. Following this they will go to a dinner at the Union at 6:00 and then to the public program in Northrop Memorial Auditorium sponsored by the American College of Surgeons. By the way, tell your friends about this event. Among others, Woltman Walters of the Mayo Foundation, Frederick Besley of Northwestern, Evarts Graham of St. Louis, Geo. T. Pack of New York, Russell Wilder of the Mayo Foundation and Washington will speak, and a movie will be shown. President Ford will give the address of welcome. There will be organ music from 7:45 to 8:15, followed by the program. Those unacquainted with the College of surgeons' policy may groan when they see the list of speakers, but it is planned much like the old style vaudeville show in which each act has its turn and no more....Today's staff meeting program report contains the following words. How many can you define without looking them up? Rhizotomy, cordotomy, tractotomy, supernated, barbotage, conus medullaris syndrome, contralateral, ipsilateral, middledorf tumor, posterior funiculus, dorsolateral fasiculus of Lissauer, substantia gelatinosa Rolandi, nucleus gracilis and cuneatus, Gower's tract, spinothalamic pain, dentate ligament, spatial dissociation, Hunner's ulcer, pseudoparalysis of Cadwalader....A few weeks ago, February 15, to be exact, F. C. Grant of the University of Pennsylvania published a report in the Journal of the American Medical Association on "Surgical Methods for the Relief of Pain." As you read that and our contribution today by Drs. Peyton and French, you will be struck by the fact that no matter which section of the United States you visit, as a result of modern methods of communication, identical objectivity in approaching disease problems is found. Although these two reports are not entirely identical, they are so closely parallel that they illustrate this point..... The Health Service again scores this week with a report in the Journal of the American Medical Association on the Ann Arbor meeting of College Health services. Dr. Boynton, after carefully analyzing unselected student records and comparing defects found with those reported from the draft, finds college students in better physical condition than those who are drafted. Possibility of selection is discussed....Everyone should turn out tonight to hear Dr. Paul White of Boston speak on "Enlargement of the Heart." He is one of the most sought after medical teachers in the country and we should consider ourselves fortunate in being able to hear him. The meeting will be held at 8:15 in the Museum of Natural History Auditorium. Those who attended the last meeting there will be pleased to know that the lantern operator now knows how to control the lights. Lent officially opened this week, which means a curtailment of the program for some of us. However, it will not deter the Irish from celebrating most effectively the feast of St. Patrick. The meeting I plan to attend will be given by the Traffic Club, an organization made up of nearly 1,000 shippers many of whom are railroad men, many of whom are Irish. The Irish and their better halves will be seated at appropriate tables where all may gaze on these wonders of creation. Once I had the privilege of extending the modest claims of the Irish to a place in the sun before one of our staff meetings, and, I am sorry to say, many of my remarks were met by groans

catcalls, and boos. Perhaps I underestimated the good qualities of the Irish....We are looking forward with keen anticipation to the course in The Anemias next week at the Center for Continuation Study (first three days of the week). We will have the pleasure then of hearing Dr. Castle, who will speak, as you will note, for the Minnesota Pathological Society on March 4th at 8 P.M. Thursday, Friday, and Saturday of next week, the sixth, seventh, and eighth, we will have a course at the Center for Minnesota physicians who have been selected by their medical societies and who will be sent here by the Minnesota Department of Health. They will study Problems of the Newborn and Premature Infants. March 13 - 15, the obstetric and pediatric nurses will make similar efforts to improve their knowledge of the care of baby mothers and their offspring, as well as older children.....This is Posture Week at the University of Minnesota, and several of the staff members have participated in the program which has been arranged by the Women's Physical Education Department. Correct posture has become a sensible subject and one which all college women could learn with pleasure and profit. The exaggerated medical claims made for it in the past have been replaced by very sensible approach.... Every time I take a trip I leave something behind. I have just discovered that I left a pair of pants in Waterloo, Iowa. Luckily, I had two pair....The late Dr. Henry Plummer (Mayo Clinic) once went to work, leaving a pair of pants on the end of his bed. As he was a forgetful man, his wife immediately called frantically all over Rochester to locate the gentleman and dress him, only to find he was wearing a pair of pants belonging to another suit.....Internist Edward L. Tuohy of Duluth brought delight to all with his philosophy concerning diet and other subjects as he took part in the course for Dietitians at the Center for Continuation Study last week. Dr. Tuohy seems to remain unchanged through the years, although I must confess when he crossed his legs I thought I saw that he was wearing long underwear. This is too revealing for anyone from Duluth to admit that their climate might be slightly on the vigorous side. On second thought, I wondered if it might have been a lightweight suit or that he wore it under protest.....In this issue of the bulletin you will find an announcement of the meeting of the Clinical Research Club to be held in Eustis Amphitheatre at 8:00 p.m., Monday, March 3. This is our newest society and one of the most interesting of the many which have been formed. Its membership is made up of graduate students, assistants, and instructors. Those not in these classifications, while they are welcome to attend, are expected to take seats in the rear and to maintain a respectful silence unless requested to speak. This is a long desired condition. You will note the program subjects which are attractive, and the names of those who will participate. At a recent meeting of the Minnesota Medical Foundation, it was proposed that the club member who made the best presentation during the year should be given a stipend to represent Minnesota at the National Meeting of the group in Atlantic City in the spring. The National Organization has been sponsored by Dr. Henry Christian and its sole purpose is to give representation to the many fine young men whose voices have not been heard because of their noisy eldsters. At the National Meeting the younger men will come under the close scrutiny of men in medicine from all over the country who will be looking for likely candidates for positions. The instructions which this society issues to its members in regard to method of preparation and presentation of papers is a model which all of us could follow. I do not know of any organization founded in recent years which is attracting such favorable attention. The leaders have their job to do and much of the success of the organization will depend upon these early years. It is planned to develop many similar clubs throughout the country....Dr. Edith Potter, pediatric pathologist at the University of Chicago, will be here March 6 and 7 to present the results of her investigations on the cause of deaths of infants. This is Dr. Potter's third trip back to her Alma Mater to teach in the continuation courses. She has also been invited to the New York Academy of Medicine this spring to make a similar report. Dr. Potter received her undergraduate and graduate training at Minnesota.....