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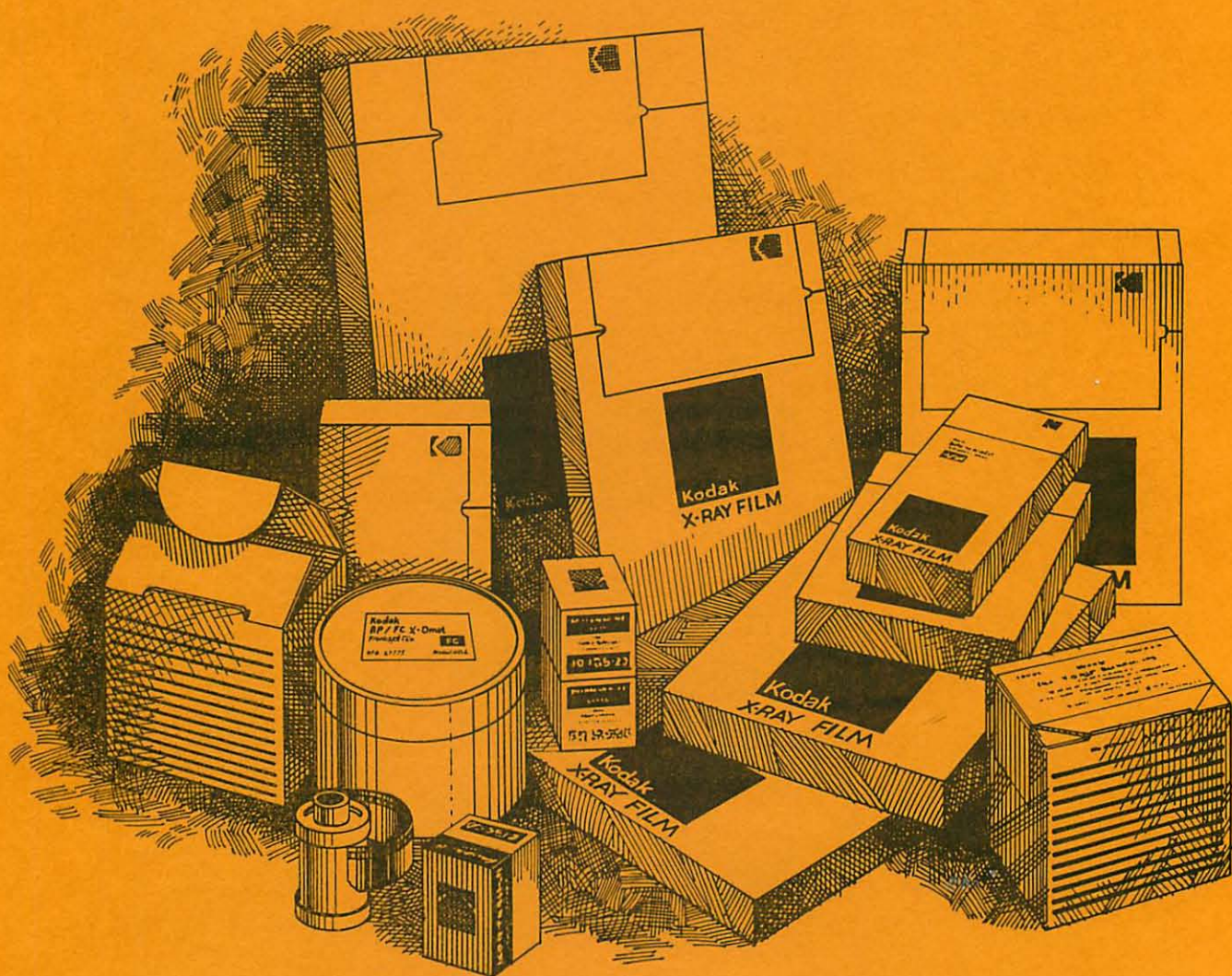


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MISSOURI RADIOGRAPHER

Vol. 1  
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Missouri Minutes is published quarterly as the communication link between the Board of Directors and members of MSRT.

Materials submitted for publication should be received no later than the 10th day of the month preceding publication.

<u>Publication Dates</u>	<u>Material Needed</u>
February 15	January 10
May 15	April 10
August 15	July 10
November 15	October 10

Scientific articles are solicited and should be submitted typed and double spaced. All materials submitted become the property of the journal.

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USING RADIOGRAPHY TO LOOK AT DRUG ABUSE

by Edna Earl Smith

During recent years, much research has been conducted on drug abuse from the moral, mental, and physical aspects. It is commonly known that abuse of any drug tends to deteriorate the body if its use is prolonged and death does not occur rapidly.

"With the development of newer drugs, the clinical presentation of the overdose patient (or those abusing drugs) will present an even greater challenge"<sup>1</sup> It is at this stage in which Radiology makes its contribution in the control of this national crisis.

Although the field of toxicology has made notable advances, in many circumstances the physician will be unable to rely solely on this modality for a specific diagnosis of drug overdose or drug abuse. Also, laboratory values may be misleading.

The practice of utilizing radiographs in determining physiological changes in the body has been used for only about five years. As in the field of toxicology and laboratory findings, the radiograph can be as misleading to the physician, if he is not aware of the fact that there has been a history of drug abuse. On the other hand, if he is aware of drug abuse, this in conjunction with other clinical findings gives him an added advantage.

The radiographic examinations most useful to the physician are of the chest, the vertebral column, and the cerebral angiogram.

"During the years 1970-1973, a study was conducted using

forty-five persons associated with drug abuse. Twenty-four of the original forty-five were admitted because of overdoses of barbiturates, tranquilizers and other sedatives. The remaining twenty-one patients were admitted because of heroin and/or methadone overdose."<sup>2</sup>

Aspiration pneumonia was often seen on the chest radiographs of these users, and the study concluded that aspiration pneumonia occurred frequently because of the absence or decreased cough reflex due to depression of the central nervous system.

Pulmonary edema was more commonly demonstrated than pneumonia in the users of heroin and methadone. The pattern of pulmonary edema ranged from the classic "bat-wing" perihilar alveolar to a prominent interstitial pattern.<sup>3</sup>

Pulmonary edema proposed several etiologies; the more important being: severe hypoxia (reduction of oxygen content); increased capillary permeability secondary to a direct toxic effect on the endothelial cell layer of the pulmonary capillaries; myocardial stress secondary to either a direct toxic effect by a contaminated agent or severe hypoxia; allergic or idiosyncratic reaction to the drug; or, hypersensitivity reaction to a contaminant.

A series of autopsies performed on narcotic addicts found severe congestion in all organs except the CNS. In addition to the pulmonary edema and aspiration pneumonia that the chest radiograph reveals, it may also reveal other radiographic findings, among those being, pulmonary emboli and pulmonary fibrosis. Case I documents these findings.

#### CASE I:

8 November 1974

This is a case of a twenty-seven year old male drug addict presented with a diffuse nodular pulmonary disease and a right sided pleural effusion. The nodules themselves are quite discrete and this military pattern is characteristic of hematogeneous dissemination, bacterial in this case.

From a radiographic standpoint, many other diseases can produce a similar pattern including fungi, viruses, parasites, leukemia, Hodgkin's disease and embolism from oily contrast media, etc.<sup>5</sup>

It would be important to note that many of the complications associated with the drug user are not a direct effect from the drug itself, but rather the method of application, sanitation, or the types of dissolving agents.

As previously mentioned, the skeletal framework also undergoes vast changes in the drug user. The drug user who presents spontaneous onset of localized musculoskeletal pain should be promptly investigated for gram-negative osteomyelitis to permit

specific antibiotic therapy.<sup>6</sup>

Between January 1969-December 1971, thirty-one cases of osteomyelitis in patients with a history of intravenous drug abuse were diagnosed at Los Angeles County/USC Medical Center.

"While one might anticipate that this complication of drug abuse would involve a youthful segment of the population, its noteworthy that the age of the patients ranged from eighteen years old to forty-eight years old, with a mean age at the time of diagnosis of thirty-nine years old."<sup>7</sup>

The earliest radiographic findings in the vertebral body are, irregular and cortical demineralization of the vertebral end plates with minimal subchondral erosion, especially in the anterior two-thirds of the vertebral body, and involvement of disk space narrowing.

Later, minimal reactive sclerosis appears at the margin of destruction and occasionally periosteal reaction may also be seen. Soft tissue findings such as paravertebral masses and indistinctness of the psoas muscle margins were frequently seen. Bone involvement at other locations manifested itself as a non-specific area of destruction consistent with the appearance of a subacute osteomyelitis.<sup>9</sup> The other bones that undergo noticeable radiographic changes are the sacro-iliac joints, radial styloid process, symphysis pubis, pelvic bone, femur, humerus, scapula and ribs. In the radiographic findings, the spine was the most frequent area affected, with spondylitis occurring in many of the cases.

Serial radiographs and tomograms are often valuable in delineating the extent and characteristics of a lesion, as Case II indicates.

#### CASE II:

A thirty-six year negro who had been a drug addict for ten years was admitted to LAC/USC Medical Center with a one month history of progressive weakness and minimal low back pain. There was no history of trauma.

Investigation of the low back region began one week after admission with radiographs of the lumbar spine which showed cortical irregularity and narrowing of the L3 L4 disk space.

After treatment for two days the patient was discharged. One week later the same patient was re-admitted with the same complaints. Tomograms showed progressive bone destruction.<sup>10</sup>

Considerable research has also been done on the vascular changes most often seen in the drug user. These changes being, the beaded irregular appearance of many of the cerebral arteries, irregular segmental changes of caliber and contour of vessel walls, most often, a small artery occlusive disease.

The Los Angeles County/USC Medical Center has done research



on cerebral angiographic changes in the drug abuse patient.<sup>3</sup> During recent years an increasing number of young people have undergone cerebral angiography with the diagnosis of "stroke."

"Many of these patients had had a history of drug abuse, but this information was gained only after extensive investigation. In the case of intravenous injections of drugs, a variety of vehicles were used as dissolving agents for the drugs, from tap water to urine. In the cases of overdoses, various home remedies such as intravenous injections of milk or mayonnaise may have been used.<sup>11</sup>

#### CASE III:

An eighteen year old caucasian woman was admitted to the emergency room, comatose of an overdose of barbituates. On admission the patient was cyanotic, apneic and without obtainable blood pressure. There was a past history of drug abuse and experimentation for at least three years and also a history of hepatitis secondary to intravenous drug use.

Initial cerebral angiography, demonstrated considerable beading deformity of the carotid and cerebral arteries.<sup>12</sup>

#### CASE IV:

A sixteen year old was admitted, comatose, with the overdose of an unknown drug or drugs. Friends stated the patient had been taking heroin and other drugs intravenously prior to admission. The chest radiograph was negative. A left common carotid arteriogram showed numerous small arterial branches with slow flow and occlusion.<sup>13</sup>

In researching the vessel changes of the drug user, it was found that the cerebral and carotid arteries were the most often affected with the overall problems being narrowing and occlusion.

While experts seem to be sure there is a relationship between the cerebral vascular changes and drug abuse, they still cannot be sure about which drug or drug combination may be responsible. For this reason some authorities have initiated an experimental drug abuse study using the Rhesus monkey.

There is also notable change in several of the body organs, among these are the liver, pancreas, small bowel and the kidney. Radiologic changes of necrotizing angitis, such as arterial microaneurysms and sacculations were seen.

In the kidney many intrarenal vessels were obliterated with associated areas of infarction. The small and medium size arteries revealed marked contour irregularity and gross indistinctness. While the exact etiologic agent has not been identified,

methamphetamine appears to be a common denominator.

The information and cases were presented in this paper not to detail every physical change the drug user is susceptible to, but rather to describe the effects of drugs abuse on the body.

The practice of utilizing the radiograph in the drug crisis is a relatively new program, with research primarily being on the West Coast. The practice of studying radiographs to look at drug abuse is not designed to detect drug addiction, but rather to delineate the extent of the damage, if there is any, to the physiology of the body. It is hopeful that the early radiographic findings of any negative effects on the body will aid the physician in the early diagnosis and prognosis of the patient; therefore, giving his chances of recovery a greater chance.

#### FOOTNOTES

1. Daniel Kido, M.D.; David Bryan, M.D.; M. Helpern, M.D. "Osteomyelitis in the Drug Addict," American Journal of Roentgenology, Radium Therapy and Nuclear, (May-August, 1973), pp. 356-360.
2. Ibid., p. 356
3. Kido, op. cit., p. 357
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5. Moses H. Cone Memorial Hospital, "Teaching File," (Nov. 1976).
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7. Ibid., p. 359
8. Kido, op. cit., p. 360
9. Ibid., p. 360
10. Ruth McCormick, M.D., Harry C.H. Fang, M.D., Thomas Bergeron, M.D. and Calvin L. Rumbaugh, M.D., "Cerebral Angiographic Changes in the Drug Abuse Patient", Radiology, Vol. 101, No. 2, (November, 1971), pp. 335-344.
11. Ibid., p. 338
12. McCormick, op. cit., p. 340
13. Melvin H. Becker, M.D. "Necrotizing Angitis Associated with Drug Abuse," Radiology, Vol. 99, No. 3, (June, 1971), p. 721.

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1. Becker, Melvin H., M.D. "Necrotizing Angitis Associated with Drug Abuse," Radiology, Vol. 99, No. 3. The Radiological Society of North America. Detroit, Michigan. 1971.
2. Bryan, David, M.D., American Journal of Roentgenology, Radium Therapy and Nuclear Medicine. American Roentgen Society Inc., Springfield, Illinois. 1973. (et. al.)



3. Fang, Harry, M.D. "Cerebral Angiographic Changes in the Drug Abuse Patient." Radiology, Vol. 101, No. 2. The Radiological Society of North America. Detroit, Michigan. 1971 (et.al.)
4. Moses H. Cone Memorial Hospital, Teaching File. Greensboro, North Carolina. 1976.

\*3rd place Student Technical Essay presented at the 1977 NCSRT, Inc., Annual Meeting.

Reprinted from Kentucky Society of Radiologic Technologists, Inc., "Shots."

#### PRESIDENTS MESSAGE

Since its founding in 1931, the Missouri Society of Radiologic Technologists has promoted continuing education. This year will not be an exception. Your organization has planned three seminars for this coming spring. These seminars will cover information of importance to educators, staff technologists and students. The dates will be listed in this issue of the "Radio-grapher."

Another area of concern by the Missouri Society of Radiologic Technologists is state licensure. You may recall, last year the bill initiated by the M.S.R.T. died in Committee. Once more we have begun work on passage of a licensing bill.

The licensure bill was presented to the House of Representatives by Rep. Lloyd Baker and Rep. Howard Garrett. The bill was placed in the Atomic Energy and Industrial Development Committee, with Rep. Lloyd Baker as chairman.

I realize many of our members are becoming discouraged because of our past legislative record. However, I feel we are making progress. I also feel, that one of our biggest handicaps is apathy in our own profession. We need - we must have - the support of our fellow technologists, if we are to be successful.

We thank you, the members of the Missouri Society of Radiologic Technologists, for your support and ask for your continued help. We need you to gain the interest and support of your fellow professionals. We need the support of all technologists if we are to be successful.

Aona DeClue, President  
M.S.R.T.

SCIENTIFIC DISPLAYS - A.S.R.T. ANNUAL MEETING

The A.S.R.T. Annual Meeting will be held in Anaheim, California, July 14-20, 1978. A large area has been designated for the scientific displays in the regular exhibit area. Applications to enter this competition are available at the Executive Office and can be obtained by writing to:

Deborah A. Churan, Professional Services Coordinator  
The American Society of Radiologic Technologists  
500 North Michigan Avenue  
Chicago, Illinois 60611

The coupon in the past issue of the Scanner can also be completed and an application will be forwarded. The deadline for receiving the completed application is June 5, 1978.

The Editors

BOARD NEWS

The Board of Directors of the Missouri Society of Radiologic Technologists met Saturday, January 21 in Columbia from 10:00 a.m. until 6:00 p.m. Those present included all officers, executive board, and one district representative.

Due to clerical and bookkeeping errors, the balance on hand indicated in the Treasurer's report at the 1977 annual meeting was incorrect. As of October 8, 1977 the cash balance was \$5,318.50.

There are three seminars planned for this year. One for educators to be held in St. Louis on March 3 and 4, a student seminar in Columbia, March 18, and the technical seminar in Columbia, April 21 and 22. Additional information on these will be out shortly.

The Nominating Committee will be sending out forms by March 10 requesting nominations; therefore, now is the time to begin deciding who you would like to see run for office next year.

Do not be surprised if you begin to hear about Radiologic Technology and the M.S.R.T. from some new sources. The Membership/Public Relations Committee has a brochure which is being distributed throughout the state in an attempt to acquaint the public with our profession, our society, and our efforts to secure state licensing.



The next Board meeting has been scheduled for April 8 in St. Louis. If there is information you feel we should have or additional topics we should deal with, please let us hear from you. We are here to serve you.

Mary Sebacher, Chairman  
Board of Directors, M.S.R.T.

### ASSESSMENT OF JOINT DISORDERS BY ARTHROGRAPHY

Michael Ward, R.T.

Arthrography indicates radiography of a joint or joints. Pneumoarthrography, and double-contrast arthrography are terms used to denote radiologic examinations of the soft tissue structures of joints (menisci, ligaments, articular cartilage, bursae) following the injection of a contrast agent or of two contrast agents into the capsular space. A gaseous medium is employed in pneumoarthrography, a water-soluble iodinated medium in opaque arthrography, and a combination of both in double-contrast arthrography. While contrast studies may be made on any encapsulated joint, the knee is the most frequent site of investigation. Other joints sometimes examined by contrast arthrography are the shoulder, the hip, the elbow, wrist, and the temporomandibular joints. Several of these will be discussed later in this paper.

The first paper to be published regarding knee arthrography was written by Werndorff and Robinsohn in 1905. This procedure did not acquire practical importance until the 1930's and 1940's when several detailed presentations on this subject were published. These authors used oxygen or room air as their contrast medium and injected it directly into the joint. Others attempted pneumoarthrography by outlining the menisci with air introduced within the joint as a manifestation of the vacuum phenomenon. This method had little practical importance because it was not readily reproduced and difficult to attain if there was any fluid within the joint.

Air and the other more quickly absorbed gases are still being used. Their main disadvantages is that with the large quantities which are used, there is uncomfortable distention of the knee as well as the possible hazard of air embolism. One death and one near death from this cause have been reported. The difference in density between the relatively radiolucet cartilage and the surrounding air is not very great and interpretation of roentgenograms can be difficult. Despite previous aspiration, joint effusion may reduce diagnostic accuracy, apparently fluid within meniscal tears. Lindblom, comparing air arthrograms with those made with water-soluble positive contrast media, found the per-

centage of accuracy higher with latter (contrast media).

Some knowledge of the normal anatomic relationships of the menisci is necessary for interpretation of arthrograms -

**MEDIAL meniscus:** the medial meniscus is a crescent shaped cartilage, triangular in cross section. Its outer surface is firmly attached to the medial collateral ligament. The superior and inferior surfaces lie free within the joint against the corresponding articular surfaces of the femoral and tibial condyles. Thus, in tangential view, the normal medial meniscus presents as a sharply defined wedge, its free inner margins thinly coated by positive contrast material and partially or completely enveloped by air. The base of the wedge is not outlined by contrast medium because of its attachment to the medial collateral ligament.

**LATERAL meniscus:** the lateral meniscus is more circular than the medial, but in cross section it is also triangular. Thus in the normal arthrogram, it is similar in contour to the medial meniscus - a sharp wedge, its free inner margins thinly coated with positive contrast and enveloped by air. However, there is a significant difference between the lateral and the medial meniscus in the manner of attachment to their peripheral ligaments. Anteriorly and laterally, no contrast material will be seen at the base of the lateral ligament. Posteriorly, it is separated from the ligament by the sleeve of the popliteus tendon which obliquely crosses the outer surface of the meniscus.

Occasionally, the gastrocnemius semimembranosus bursa fills with contrast medium and, when it is large (a so-called popliteal cyst), it may interfere with evaluation of the posterior portion of the medial meniscus.

Tears present as abnormal collections of contrast substance within the wedge-shaped cross-sectional view of the meniscus and/or as a deformity in the contour of the wedge. Brief consideration of the basic types of tears is helpful in understanding the abnormal arthrogram.

For purposes of filming the meniscus has been considered to composed of three parts: posterior horn (posterior third), the anterior horn (anterior third), and the central section (middle third).

Since there is no such thing as a room especially designed for arthrography, a basic X-ray room with a fluoroscopic unit and over-head tube should be approximately 20 feet by 25 feet in dimensions. The previewing and processors should be centrally located. Essential to the sharpness of detail, is the use of a small focal spot, which affects the quality of the films produced for interpretation. Photo timing of the exposures in this examination does



not appear to work satisfactorily, and the best results are obtained by setting the technique at the control panel manually. A room with an X-ray generator, fluoroscopic unit and table, control panel, transformer, and overhead tube, today with phototiming, etc. is currently priced at approximately \$204,000.

There are 3 methods of getting films for knee arthrography, they are: 1. the horizontal method 2. the verticle method 3. the fluoroscopic method.

The horizontal method of performing double-contrast arthrography of the knee was first described by Andren' and Wehlin. It was found that by using a horizontal ray projection and a comparatively small amount of each of the two contrast agents, improved double-contrast delineation of the knee joint structures could be obtained. This is because excess of the heavier iodinated solution drains into the dependent part of the joint, leaving only the desired thin opaque coating on the gas-enveloped uppermost part then under investigation.

Six films of both the medial and lateral meniscus are obtained:

For the medial meniscus - 1. the patient is adjusted in the semiprone position that places the posterior aspect of the medial meniscus uppermost. 2. to widen the joint space, the cylindrical cotton pillow is placed under the lower end of the femur and a sandbag is placed across the ankle. 3. the central ray is directed along the line that is drawn on the medial side of the knee and centered to the meniscus. 4. the vertical film holder is placed between the patient's legs and adjusted to center the exposure windows to the central-ray.

With rotation toward the supine position, the leg is turned 180 degrees, with 30 degrees variance for each of the 6 films. The lateral meniscus technique is very similar to that of the medial. A soft tissue technique and focal-film distance of at least 40 inches (perferably 48 inches) are used for these studies.

#### Verticle ray method:

Contrast arthrography of the knee by the verticle ray method requires the use of a special frame. The extremity is adjusted and strapped into a frame to widen or "open up" the side of the joint space under investigation. This widening, or spreading, of the intrastructural spaces permits better distribution of the contrast material around the meniscus.

The views taken of each side of the joint usually consist of a direct frontal projection and 20 degrees right and left oblique projections. The oblique projections may be obtained by rotation of the leg or by central ray angulation. This uses the single contrast method.

The horizontal and vertical ray methods rely mainly on the technologist for the films after injection by the radiologist. The technologist is specifically in charge of positioning and technique.

#### Fluoroscopic Technique of Double Contrast Arthrography of the Knee:

This technique meets the requirements of any method of double contrast examination in arthrography - that is it should (a) be simple to perform, requiring a minimum of time and expense; (b) be without hazard to the patient; (c) produce no mortality or negligible morbidity; (d) be of reasonable and reliable diagnostic accuracy; and (e) be reproducible in the hands of multiple examiners of varying levels of ability and experience.

The aim of the fluoroscopic technique is to obtain diagnostic films of adequate contrast and fine detail. For this the patient must be carefully positioned for each film and adequate stress must be applied to open up the joint. An attempt must be made to manipulate the knee in such a manner as to separate the meniscus from the condyles and the tibial plateau, and to allow its margins to be seen as tangentially viewed interfaces within the joint. The knee should be held in position after each spot film, fluoroscoped again and rotated into position for the next film under visual control.

For this technique the radiologist plays the role, because it is he who watches under fluro to position the knee. The technologist is responsible for making exposures when the radiologist has the meniscus in proper profile. Proper techniques are left up to the technologist, the average technique is 25 MaS at 57 Kv with a grid and par screens.

With the patient in a prone-oblique position the examination is begun at the posterior horn of each meniscus. The first films are made of the segment of meniscus that becomes visible just as the leg is rotated out of a true lateral position. Three or four films are made of each horn or third of the meniscus with 6 to 10 degrees of rotation after each segment of the meniscus has markedly decreased the number of instances in which additional films were needed after viewing the developed film.

A cloth band is used as a restraint device which will allow the examiner to position the patient for filming and simultaneously stress the knee.

In order to see the cruciate ligaments the restraint is removed and the patient assumes a lateral position with the leg being examined down against the table. By rotating the hips the knee is brought into a true lateral position and flexed to approximately 45 degrees. This places the anterior and posterior cruciates under equal tension. The suprapatellar recess joint space and popliteal region should be included on the film.



To demonstrate the patellar cartilage the patient is maintained in the lateral position and the field coned down to a vertical split size. With the leg extended, slight rotation to the prone position will bring the lateral cartilage into view, and the slight rotation to the supine position, the medial cartilage is seen.

#### Instrumentation and Contrast Media:

A sterile tray should be used consisting of -

- 1 30ml. syringe
- 2 10ml. syringes
- 2 22 gauge  $1\frac{1}{2}$  inch needles
- 1 25 gauge  $\frac{3}{4}$  inch needle
- 2 small prep basins

Forceps, gauze pads for skin preparation, drape with central opening and towels.

The contrast media usually used is Renografin 60, 4ml. is used diluted with 0.35ml. of 1:1000 solution of epinephrine. Epinephrine improves the sharpness of the contrast outlined intra-articular structures as well as in the persistence of enhancing detail on delayed radiographs, since it helps to slow down contrast media absorption. In addition to this positive contrast, 30ml. of air is also injected into the joint space, so that there is further displacement of the contrast material both laterally and inferiorly.

The area approximately around the injection site must be thoroughly cleaned with some sterilizing solution, and draped. For the injection, either a medial or lateral approach may be used according to the operator's preference. The patella is palpated to locate the superior and inferior margins. In the medial approach the thumb of the left hand naturally finds the recess at the mid part of the patella which is formed by the medial margin of the patella, the tibial plateau and medial femoral condyle. Entry into the joint is made at this site.

Lidocaine (Xylocaine) 1% is used to deaden the skin at the sight of injection. Prior to this the radiologist draws off any effusion present inside the joint space. When the joint space has been successfully entered, a trial installation of lidocaine should reveal free flow without pressure or resistance. The renografin and air are then introduced into the joint space. For 24 to 36 hours after the arthrogram, the knee will continue to bubble and may give slight pain, but not severely.

When examining the knee with the arthrography technique, one not only has the opportunity to observe the menisci and their relationship to both the medial and lateral collateral ligaments, but also to evaluate the integrity of these structures. In the presence of a torn ligament, the joint space will open much wider

than normal, and with acute tears, contrast material and air may escape through a tear in the capsule.

#### Other types of Arthrography:

##### Ankle Arthrography:

The ankle is compoundly a joint formed by the tibia, fibula, and talus. The joint capsule is attached at the bone-cartilage border of these bones. The ankle and subtalar joints have many ligaments in common and function as a single unit, allowing pronation and supination of the foot.

Clinically the term ankle sprain should be reserved for a complete ligament rupture. Unfortunately, the signs and symptoms of complete ligament rupture are simulated by less serious injuries, and differentiation on clinical grounds is often not possible. Stress films can be useful in the radiographic analysis of soft-tissue injuries about the ankle joint.

For preparation, the skin is scrubbed. Local anesthesia with 1% Xylocaine is administered. The ankle joint is entered antero-medially with  $1\frac{1}{2}$  inch, 20 gauge needle, one can tell when the joint has been entered by the ease of Xylocaine injection and by observing the position of the needle tip at fluoroscopy. After puncture any fluid in the joint space is aspirated so as not to dilute the contrast agent. Either 50% Hypaque or Conray is used, approx. 6 to 10m. is injected under fluoro.

Films are then exposed as rapidly as possible in the AP, oblique, and lateral projections. In a normal arthrogram no extra-articular leak of the contrast agent occurs except for contrast filling of the tendon sheath of the flexure hallucis longus and/or the flexor digitorum longus.

Ankle arthrography is an accurate method of evaluating injuries of ligaments, and evaluation is necessary if the physician wishes to immobilize completely only those cases of ligament ruptures. Ankle arthrography will play its greatest role in evaluating patients with persistent ankle pain following adequate treatment.

##### Hip Arthrography:

The examination is carried out under a general anaesthetic and with full aseptic ritual. The procedure is controlled by brief fluoroscopy with an image intensifier, using minimum screening currents.

A lumbar puncture needle is introduced under the adductor tendons and directed more or less horizontally in a cranial direction. Once the needle has entered the soft tissues far enough to support itself, the operator should remove his hand and check the needles



position by quick fluro. When the needle is in position, a syringe containing a few ml. of dilute contrast medium such as 25% Hypaque is attached to the needle. If the contrast medium is entering the joint correctly it quickly flows around its periphery in a very characteristic way that leaves the radiologist in no doubt of its correctness. The amount of contrast required is small and its exact quantity is decided by the fluoroscopic appearances. The needle is withdrawn and well coned radiographs are taken.

AP views and frog laterals can be taken. Films in internal rotation, the neutral position, external rotation and in abduction can all be useful. The radiographs must be correct technically the first time because absorption of the contrast medium is quite rapid.

Within the main mass of contrast medium a translucent area indicates the cartilage of the femoral head, surrounding its ossification center. In the normal hip, this translucent area plus a thin shell of surrounding contrast medium extends close to the acetabulum except at its outer lip, where there is a roughly triangular filling defect.

#### Shoulder Arthrography:

Positive contrast arthrography of the shoulder graphically demonstrates the integrity, shape and capacity of the glenohumeral joints. It is used to show ruptures of the musculotendinous rotator cuff, adhesive capsulitis (frozen shoulder) and the degree of soft tissue damage in patients with recurrent shoulder dislocation. Distinction between muscle spasm, tendinitis and rupture of the rotator cuff may be difficult when conventional roentgenograms are negative. For this reason, it is believed that interest in the study of the shoulder by arthrography is increasing.

Internal and external rotation X-rays and axillary and bicipital groove X-rays are obtained and inspected before the injection.

The arm is placed in neutral or mild internal rotation where the anterior joint capsule will be lax. Under aseptic technique, the skin is infiltrated anteriorly with 1% lidocaine about one cm. beneath and lateral to the coracoid process. When correct needle placement has been established, usually 10-15 cc. of renografin 6- is introduced and the needle is withdrawn. The shoulder is exercised briefly to distribute the contrast medium and X-rays are made in internal and external rotation. Axillary and tangential X-rays of the bicipital groove are then obtained. If the initial series of X-rays shows no abnormality or questionable leakage of contrast material into the subacromial bursa, delayed films are made in internal and external rotation.

Of major importance in interpreting the arthrogram is the

anatomy of the subacromial and subcoracoid bursa. The subacromial bursa superiorly and the subcoracoid bursa anteriorly are often combined into a single large bursa. The bursa, in turn separates the cuff from the deltoid muscle and the coraco-acromial arch.

Shoulder arthrography is a useful aid in the diagnosis of rupture of the rotator cuff, adhesive capsulitis and in the pre-operative evaluation of recurrent shoulder dislocation.

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#### DATES TO REMEMBER

##### A.S.R.T.

Mar. 9-11, 1978

ASRT Radiation Therapy Seminar  
Cherry Hill, N.J.

Apr. 12-14, 1978

ASRT Education Seminar  
Bloomington, Mn.

ASRT Annual Meeting  
July 14-21, 1978

Anaheim, California

##### M.S.R.T.

Mar. 3 & 4, 1978

Educators Seminar  
St. Louis Community College  
at Forest Park  
St. Louis, Missouri

M.S.R.T. (dates cont.)

Mar. 11, 1978	Radiation Therapy meeting St. Mary's Hospital Kansas City, Missouri
Mar. 18, 1978	Student Seminar Columbia, Missouri
Apr. 21 & 22, 1978	Technical Seminar Columbia, Missouri
Oct. 19, 20, 21, 1978	M.S.R.T. Annual Meeting Joplin, Missouri

MISSOURI HOUSE BILL 1638 GETS HEARING

House Bill 1638 was brought to a hearing before the Atomic Energy and Industrial Development Committee in Jefferson City on January 30. As indicated in the Presidents Message, Representatives Lloyd Baker and Howard Garrett introduced the Bill. Representative Baker is the committee chairman. The Bill provides for the licensure and regulation of certain uses of ionizing radiation.

Aona DeClue, R.T., President; Norman Hente, R.T., President-Elect and Coretta Schroer, R.T., Past President all representing the Missouri Society of Radiologic Technologist, were present for the hearing and spoke in favor of the Bill. Dr. Wilson, past president of the Missouri Radiological Society, offered supportive testimony to the committee. There were no speakers in opposition. It is hoped that the Bill will come out of the committee soon and will go before the full House of Representatives.

Technologists are asked to write their Representatives to support this important piece of legislation.

The Missouri Society of Radiologic Technologists is very appreciative of the efforts put forth by Representative Lloyd Baker and Representative Howard Garrett in supporting this Bill.

Darrell McKay, B.S., R.T.  
Dwayne J. TerMaat, B.S., R.T.  
Co-Editors

UPDATE FROM YOUR A.S.R.T. REGIONAL DIRECTOR

I just returned from the Mid-Year Board Meeting of the American Society of Radiologic Technology and have lots to report.



1. The Joint Review Committee on Education in Radiologic Technology is publishing a Directory of Approved Programs in Radiography and Radiation Therapy. It will be available in March and will be sent to all approved programs.
2. All radiologic technology programs will soon be receiving a very comprehensive bibliography of all books published and still in print regarding radiologic technology. The Bureau of Radiological Health is sponsoring this activity.
3. The American Registry of Radiologic Technologists is holding invitational seminars for educators. All educators must attend at their own expense. If you are interested in attending one of these conferences where the registration and testing process is explained, please write to the Registry to have your name put on the list. Address: 2600 Wayzata Blvd., Minneapolis, Minnesota.
4. The ASRT is establishing a standing committee on Quality Assurance. If this is your primary work responsibility and you would like to belong to this committee, please let me know right away.
5. The ASRT has established a task force to develop a job description and curriculum guide for Physicians Assistants in Radiology.
6. The Special Studies Curriculum Guide is now ready for the printers. It is planned that it will be available for sale at the Annual Meeting in Anaheim, Ca. this summer.
7. The 1984 Annual Meeting will be held in Detroit, Michigan.
8. A new addition to the Annual Meeting (ASRT) this summer will be a room that is set up and supplied with educational material that is eligible for ECE approval. Any eligible technologist will be able to go into this area, choose a subject that they wish further education in, have the projection equipment available along with the educational material and someone there to verify their attendance for ECE credit. It will be open limited times so if you are interested and going to the meeting, please check your program early in the week and make your plans accordingly.
9. The E.C.E. program will have been in existence three years as of July 1, 1978. The original enrollment is for a three year period so you will have to go through a re-enrollment procedure. The ASRT will send you all of the information to complete this enrollment in time for you to continue your eligibility.
10. As of July 1, 1978 point restrictions will be removed from E.C.E. so technologists may individualize the route by which they obtain E.C.E. points. The only limitation will be that not more than 10% of the points may be in non-related activities. You will now be able to get all of your 100 points every 3 years in inservice or college or district, state or national meetings or a combination of any or all of the above.

11. Effective July 1, 1978, E.C.E. points will be awarded for each session that is attended by the participant. The way it is set-up now, when attending an extended course (like the 8 hour courses offered at the ASRT annual meeting) the participant has to attend every one of the sessions to get any credit at all. Now you will get one hour credit for each hour actually in attendance.

I know that there is a lot of new information in the above and my explanation may not be totally clear to you. If not, PLEASE don't hesitate to contact me for further explanation. If we are going to grow professionally, we've got to keep the lines of communication open.

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#### M.S.R.T. MEMBERSHIP DRIVE

As mentioned in the last issue of the RADIOGRAPHER, the Board of Directors of the Missouri Society of Radiologic Technologists have approved a state-wide membership drive. The following rules have been established:

1. Drive to begin December 1, 1977 and end September 15, 1978.
2. There are two categories of competition:
  - a) Technologist
  - b) Student
3. Technologists may recommend only technologists as new members. Students may recommend only students as new members.
4. Inactive members will receive no credit.
5. To be eligible for a prize, one must sign up five or more new members. Prizes to be awarded:
  - a) \$35.00 as First Prize in technologist and in student category
  - b) \$15.00 as Second Prize in technologist and in student category
6. All new applicants should have the name of the technologist or student recommending them on the application form.

Application forms may be obtained from the District Representatives.

Can your department staff achieve 100% membership in the M.S.R.T.? If you can, your institution will join this prestigious list:



- |  |
|--|
| <p>1. TRUMAN MEDICAL CENTER<br/>Kansas City, Missouri<br/>24 members</p> |
|--|

Note: There have not been any new institutions that have joined this list since the last issue of the RADIOGRAPHER.

The Editors

#### MEMBERSHIP/PUBLIC RELATIONS

The Membership/Public Relations Committee has been very busy. They are trying to compile a list of possible speakers throughout the state whom they could get to present the slide/tape program that was produced a few years ago. If you would be interested in helping the M.S.R.T. in this way, contact the committee chairman found in the front of this journal. The slide/tape program provides some insight into what a career in Radiologic Technology is all about. The program is titled: "Looking At the Radiologic Technologist" and is appropriate for presentation to high school students and other groups whose members may be interested in a career in Radiologic Technology.

A pamphlet titled "You And Your Radiation Safety - What You Should Know About Basic Radiation Tips From the M.S.R.T." has recently been developed and printed. The committee has 2,000 copies available for distribution. Contact the committee chairman if you would like some to distribute. The pamphlet includes basic radiation safety tips for patients, information regarding licensure and encourages the public to write their congressmen regarding support of the licensure bill introduced by the M.S.R.T. The following excerpt is from the pamphlet:

Because You Are A Professional Radiologic Technologist . . .  
Are You Aware That . . .

Thirteen of the United States have enacted licensure laws establishing minimum qualifications for operators of radiation emitting equipment;  
and . . .



Twenty of the United States have introduced similar licensure bills in their legislatures;  
and . . .

The Society advocates equal level continuing education in all rural, urban and suburban areas;  
and . . .

The Federal Government, through various of its agencies, is developing and establishing standards relative to the radiation exposure of patients;  
and . . .

The Society supports federal minimum standards of not less than two years of education for operators of equipment emitting radiation;  
and . . .

The Society believes it appropriate to express concern about unnecessary radiation exposure of patients caused by equipment operators who have had less than the established education standard;  
and . . .

The Society advocates conscious control of budgetary expenses in the performance of radiologic patient care;  
and . . .

The Missouri Society of Radiologic Technologists has introduced a licensure bill in the Missouri state legislature.

. . . . You Should Be!

#### WHAT YOU SHOULD KNOW ABOUT LICENSURE . . .

State licensure for various professions is nothing new. Physicians, nurses, and even barbers and beauticians are required to have a state license before practicing their desired professions. These licensing laws were established to safeguard you, the consumer, by eliminating unqualified personnel from practicing these professions.

The M.S.R.T. feels that you deserve this same protection when you are in need of an X-ray examination.

Thirteen states currently have licensure programs for radiologic technologists. A survey was performed in three of these states, California, New York and New Jersey, by the Bureau of Radiologic Health, a federal government agency, to review the effectiveness of the licensing systems. Some of the data obtained is very pertinent to your radiation safety:

1. Contrary to popular opinion, state licensure has not created a shortage of qualified radiologic technologists in the three states.

2. There was no significant change in the availability of the delivery of radiologic services as a result of the licensing laws in the three states and no increase in cost to the consumer.
3. Because of better technical knowledge, the trained operators delivered a significantly lower average radiation dose to the patient than the untrained or physician operators of x-ray equipment.
4. Approximately 70% of the untrained operators had no formal training in radiation safety or proper positioning.

WHAT CAN YOU DO?

WRITE . . . to your state representative and senator for more information on the bill sponsored by the Missouri Society of Radiologic Technologists.

Urge your representative and senator to VOTE IN FAVOR of State Licensure For Radiologic Technologists.



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