

Editorial

"Though this be madness, yet there is method in 't."

Shakespeare.

It seems appropriate for the Editor to offer some comment, by way of explanation, for the changes in cover and title pages appearing in this issue of the Bulletin.

Those of you who have been used to the clear cut and unblemished face of the Bulletin during the past years may at first feel a little offended to find that this has now been scarred and wrinkled by the demands of economy and utility.

Nevertheless, it is our opinion that this break with habitual form is more than justified by the convenience to the reader of having the contents readily displayed on the cover and by an appreciable reduction in printing costs at a time when The Medical Society of Nova Scotia is finding it difficult to balance its budget. The addition of four extra lines of printed matter per page is a further economy which is less noticeable to the casual reader, but which will in effect reduce the average Bulletin by two pages while offering the same amount of reading material.

A review of advertising methods and rates, and ways and means of increasing our advertising is also under consideration at the present time, and it is the earnest hope of the Editorial Board that some increase of revenue may be obtained from the Bulletin and returned to the coffers of The Medical Society.

Vascular Emergencies In General Surgery

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OPERATIONS on peripheral arteries for injuries and diseases have been advocated and performed as early as at the turn of the century. Restoration of continuity of arteries by end to end anastomosis or by the use of arterial grafts had been done successfully by Enderlen, Hoepfner, Stich and Bode.

Since then cardio-vascular surgery has become a speciality practised by a relatively small group of surgeons. The general surgeon has more and more tended to lose direct contact with this important field and has often been content to stare with awe and wonder at these achievements.

This unfortunately has resulted in a neglect of the training of the general surgeon in vascular surgery leaving him no other choice than to refer vascular emergencies that have come under his care to a vascular surgical center even if this may mean a serious delay. Thus, although the general surgeon may know the treatment of an arterio-venous aneurysm, he probably will actually never deal with such an elective case, whereas he may be quite unfamiliar with the necessary emergency treatment of a case of acute arterial embolism.

Many pathological conditions involving the great vessels represent emergencies and have to be dealt with immediately or within a very limited period of time. Furthermore these vascular accidents often happen at home, or in hospitals on non surgical wards, and delay in securing the advice and help of the surgical colleague is often the cause for an unfavorable result. Delay is one of the reasons why operations for traumatic vascular emergencies are only successful in 30 to 40% of all cases as compared with 60 to 100% in the elective group of arterio-venous aneurysm and of congenital and chronic occlusions.

How much active teaching of interns and residents by internists, anesthesiologists and surgeons and by publications in the literature can do to focus attention on a previously relatively neglected emergency is shown by the improvement in the diagnosis, prevention and treatment of cardiac arrest. This new approach has already saved the life of many patients and with wider knowledge the results will become even more satisfactory.

It is the intention of this article to stress the role the general surgeon may have to play in acute vascular emergencies and how he might deal with them. The cases mentioned here have been encountered by the writer and personally treated during 15 years of surgical service in various hospitals of 150 to 3500 beds capacity.

Principles in Vascular Surgery.

A few principles which long have been emphasized by vascular surgeons should be mentioned here for the benefit of the occasional operator. The vessels have to be dissected at the adventitial level to liberate them from the surrounding tissue. Blood vessels, small or large, are not tied. The goal of the operation is defeated by further damage to an already greatly deficient

circulation. A clear and bloodless field should be obtained by the use of continuous saline irrigation preventing the tissue from becoming dry. Gentle pressure with small, moist sponges will prevent the formation of hematomas. There should be available at least two or three units of blood and some type of graft or prosthesis. Irreparable damage or large defects of the vessel wall often make an anastomosis impossible and then the defect has to be bridged by graft or prosthesis. The difficulties of obtaining and storing homografts continue to be considerable as can be seen from the large score of suggestions and methods recommended. To diminish the risk of narrowing and thrombus formation at the suture site and to shorten operation time the side to end bypass graft has been recommended by Kunlin, Linton and Luke and has lately gained many supporters.

It is still too early to reach definite conclusions regarding the use of tubes of synthetic material to replace large arteries and arterial grafts. However, the early results with prosthesis of Vinyon "N", Ivalon, nylon cloth, dacron, teflon and others are amazingly good. It is hoped that the difficulties associated with the obtaining and preserving homografts would thus be by-passed, facilitating greatly the general surgeons part in dealing with vascular emergencies. Rosenberg et al. have enumerated as the advantages of plastics, that they are strong, stimulate fibroplasia, produce minimal reactions only and are readily available and as their disadvantages, the difficulty in tailoring and constructing branching forms, wrinkle thrombosis, inelasticity and their failure to grow with the host.

Vascular Disorders at the Hilum of the Kidney.

Though an operation for vascular abnormalities at the hilum of the kidney is usually not done as an emergency, occasionally, as not anticipated findings appear at operation, it may become one. The surgeon then may have to decide between abandoning the operation and having the patient operated on a second time by someone more experienced or to do surgery considered to be out of his field.

Aberrant vessels interfering with the normal outflow of urine from the renal pelvis can ordinarily be ligated and cut with impunity. But with the enormous possible number of congenital abnormalities of position, number and size of the blood vessels at the hilum of the kidney, it is not surprising that the surgeon will sometimes encounter unexpected conditions. That it is not always necessary and sometimes even impossible to cut the obstructing vessels without causing permanent damage to the kidney is shown by a case observed recently.

Case I: 2979/54 A.W. This 17 year old white female was admitted to St. Joseph's Hospital, Glace Bay, on November 25, 1954. A hydronephrosis of the left kidney pelvis was thought to be caused by an aberrant vessel and surgery was advised. The exploration disclosed compression of the pelvi-ureteral junction by the renal artery and the renal vein, the former crossing the first portion of the ureter anteriorly and the latter posteriorly. The ureter was cut at the uretero-pelvic junction and reimplanted into the lowermost portion of the kidney pelvis posteriorly to both vessels. Thus the obstruction was completely relieved.

Hemorrhage from Mouth and Neck Injuries.

Injuries to mouth and neck are mentioned here because of the possible bleeding from large lacerated surfaces and from injured large blood vessels of the neck. Hemostasis by compression frequently can not be achieved because of the danger of respiratory obstruction. A tracheotomy under such condition is imperative and should not be delayed. It will remove not only the danger of respiratory obstruction but will also help to prevent other complications like aspiration of blood and of wound and mouth secretion, and will remove the dangerous effects of inflammatory epiglottic and laryngeal edema.

Case 2: 2615/54, N.T. This 39 year old man was admitted to the Glace Bay General Hospital on November 19, 1954 about half an hour after an accidental gunshot wound of the face resulting in a large defect of the lower jaw, the floor of the mouth, the tongue and the palate. There was considerable bleeding from multiple torn arteries and oozing surfaces. A rapidly increasing hematoma at the floor of the mouth gave rise to considerable respiratory distress, cyanosis and congestion. A low tracheotomy was done and adequate hemostasis then was possible by means of pressure bandages and packings to the oozing wounds of the mouth, cheek and floor and by the ligation of the spurting bleeding points. The patient then could safely be sent on a four hour flight to a plastic surgical clinic for more definitive treatment.

Tibial Artery Compression Syndrome.

This syndrome is characterized by acute ischemia of the foot and distal third of the lower leg following a subcondylar tibial fracture and is due to a compression of the popliteal artery at the forking point of the anterior tibial artery by the upper border of the interosseous membrane which has been shifted cephalad by the displacement or impaction of the fragments. In only a few cases reduction of the displaced fragments, or in case of impaction, disimpaction will free the artery and will restore circulation in the foot. Unless circulation is not restored within two to three hours following manipulation and reduction the surgeon has to explore the popliteal artery at the branching point of the anterior and posterior tibial artery. This can be achieved best from a combined anterior and posterior approach as described by Henry. The interosseous membrane on which the fork of the vessels rides should be incised freely. Lumbar sympathectomy to relieve spasm can be done at the same time.

Case 3: M.M., 335/54. This 59 year old white male was admitted to St. Joseph's Hospital in Glace Bay following a car accident. Besides a severe concussion and multiple arm fractures, he had suffered a subcondylar tibia fracture with considerable displacement. The patient was unconscious. The left foot appeared white and cold and there was no pulse in any of the palpable arteries of the foot. About two hours after the accident the fracture was reduced and the leg immobilized in a padded cast. Traction was applied with the understanding that in case of continued vascular interruption an exposure of the anterior and posterior tibial artery would be necessary. Fortunately the color and the temperature of the foot improved though the pulse could still not be felt. It was not until two days later that the circulation appeared restored to normal.

Acute ischemia of the lower leg was also seen in a patient who had suffered a crushing injury to the proximal third of the lower leg, in which the fibula head was comminuted. The displacement of the fragments towards the lateral tibia condyle had caused a compression of the popliteal artery at its bifurcation.

Anterior Tibial Syndrome.

An interruption of the arterial circulation of a high tibia fracture may be confined to the anterior tibial artery in cases in which the artery comes off slightly cephalad to the upper edge of the interosseous membrane and in which the proximal tibia fragment is displaced posteriorly. A similar pathology is seen in a condition known as anterior tibial syndrome.

Case 4: 6740/44, B.M. This 42 year old man had to abandon his car because of engine trouble and had to walk about 12 miles. He had noted previously that during walks which he had to take rarely he had developed sharp agonizing pain in a band shaped area over the antero-lateral aspect of both lower legs. The same pain was experienced now on this last walk. He had to give up and was brought to our hospital on the following day. The left lower leg was swollen, mostly in a strip lateral to the anterior margin of the tibia. This area also was extremely tender to touch and very hard. The overlying skin was red. The dorsalis pedis pulse was absent on the left foot while it could be felt on the right. No other abnormalities in the circulation were noted. Erroneously a myositis of unknown origin was diagnosed and a muscle biopsy was undertaken. After splitting the very tense fascia of the extensor compartment the true picture became evident as the pale muscle was seen bulging through the incision which was then carried downwards to secure complete decompression. Only the skin was closed. Following the operation the pain subsided but some weakness of the long extensor hallucis muscle remained permanently.

In this syndrome the three muscles in the anterior tibial compartment undergo swelling due to over exertion, acute arterial insufficiency (Hughes), trauma, deep localized venous thrombosis and compress the anterior tibial artery against the upper margin of the interosseous membrane. Carter gives the sequence of events as follows: Unaccustomed exertion-muscle trauma-increased pressure within the anterior tibial compartment-impaired blood supply to the affected muscles-ischemic necrosis.

The main clinical features are pain, swelling, redness and tenderness in the front of the lower leg and inability to dorsiflex the foot and toes. Decompression by splitting the tense fascial sheath is the logical treatment. Recently this syndrome has been described by Watson in a patient with arterial embolism. The response to spasm relieving measures was good.

Kulowski in his articles on subfascial hydraulic compression from bleeding, edema and other tissue changes of unknown origin has recommended as a fast and a simple method of draining or decompressing the subfascial spaces at elbow, forearm, wrist, back of hand and foot and lateral compartment of lower leg multiple closely grouped stab wounds through the skin, subcutaneous tissue and fascia over the entire affected area, of course under aseptic conditions.

Volkman's Ischemic Contracture.

This disabling complication is most often seen as an aftermath of a supracondylar fracture of the humerus. The following preventive and therapeutic measures have been widely accepted. All manipulations for the reduction of the fracture should be gentle, hyperflexion of the elbow should always be short of the position which causes the radial pulse to disappear. The cast should be such that it does not constrict the arm at any level and especially not in the cubital fossa. Should the pulse in the radial artery be absent from the beginning, a laceration, compression, or thrombosis of the cubital artery should be suspected. If reduction of the fracture is not followed by return of the pulse the cubital fossa should be explored and the cubital artery exposed. Very often evacuation of the hematoma under the tense cubital fascia will suffice. A laceration of the artery can be repaired and successful end to end anastomosis of completely divided vessels has already been reported. In the presence of thrombosis a thrombectomy can be tried and if there is no return of pulsation in the cubital section of the vessel the exposed segment should be resected. According to the teaching of Leriche and Vachon the completely occluded segment only acts as a trigger area for the production of spasm. All these procedures are preceded and followed by novocain stellate blocks. Kulowski has advocated the injection of 1% Procain solution directly into the median nerve at the site of the injury to relieve reflex arterial spasm. It is done during the exposure and open reduction of the fracture or together with one of the above mentioned measures.

Scalenus Anticus Syndrome.

This syndrome deserves mention here because, apart from nervous, neurotrophic and vaso-motor disturbances an actual compression of the subclavian artery is a frequent feature. The recognized treatment is the transection of the scalenus anticus muscle. In the odd case, however, this had not resulted in complete relief. The reason for this was found to be a very taut omohyoid muscle. This muscle should be cut in all cases of scalenus anticus syndrome which are associated with pain in the area of the scapula. It is due to irritation of the dorsalis scapulae and the suprascapular nerve by a taut omohyoid muscle.

Case 5: 2243/54, L.S. This 36 year old miner was admitted to St. Joseph's Hospital on March 7, 1954 with a longer than one year history of gradually increasing weakness and paresthesia in the left arm with pain radiating into the middle finger. There was also pain in the left scapular region. The pulse in the radial artery was weak and disappeared completely on inspiration and simultaneous turning of the head towards the left (Adson). A diagnosis of scalenus anticus syndrome was made and a scalenotomy done on March 9. The pain in the left arm disappeared immediately after the operation but the pain in the shoulder region was still present and became even worse the following months. It was thought that the omohyoid muscle was responsible for this complaint. The muscle was exposed and cut on August 25. The patient is free from symptoms since.

Myotomy of the scalenus anticus muscle is a minor operation. Poor results, however, are not rare because of failure to split the fascia which, as an extension of the prevertebral fascia forms a sheath for the anterior scalenus muscle and covers the subclavian artery and the brachial plexus in the posterior triangle of the neck (Sibson's Fascia). The operation should not be considered as complete unless the subclavian artery is freed to such an extent that it can slide downwards over the scalenus tubercle of the first rib. Not always is the myotomy as simple as that. In elderly patients or in cases of longstanding disease arteriosclerotic changes in the artery may be so far advanced that sudden release of the muscular support may be followed by rupture or aneurysm formation. Care is also required to avoid injury to the vasa vasorum, for, if they are damaged, extravasation of blood will take place between the muscular and adventitial coats of the vessel and arterial thrombosis has been seen to follow.

The presence of a cervical rib in scalenus anticus syndrome should not be an indication for the resection of this rib. Very often scalenotomy alone will give an excellent result. Should it fail to do so the rib itself can be attacked. This formidable procedure should not be undertaken lightly. The author has found the posterior approach preferable and much better access to the cervical rib can be gained by a resection of $1\frac{1}{2}$ to 2 inches of the posterior portion of the first rib.

Injuries to the intra-abdominal Arteries.

Injuries to large intra- and retroperitoneal vessels may occur during an operation accidentally or as a result of a perforating injury. In the first case the chances for survival are considerably better than in the latter because no time is lost for diagnosis and preparation for the operation.

Case 6: 2386/43, L.L. This 32 year old female had been admitted to the General Hospital Barmbeck for biliary attacks. She underwent an elective cholecystectomy for cholelithiasis and non functioning gall bladder. During the closure of the peritoneum the abdominal cavity suddenly filled with bright red blood which was thought to come from the cystic artery stump. This could not be confirmed on exploration; the source of bleeding rather seemed to be in the pelvis. The abdomen was opened by another incision in the lower abdomen. A two month old ectopic pregnancy was found to be attached to the right posterior area of the pelvic rim. The ovaries had been partially detached, probably during the blind manual exploration of the abdominal cavity, and there was brisk arterial bleeding from a five mm long tear in the anterior wall of the right common iliac artery. The hemorrhage was arrested by digital pressure and after removal of the gestational sac the iliac artery was temporarily compressed by a bulldog clamp, applied proximally to the tear. The defect was closed by continuous over and over suture with fine silk. The postoperative course was uneventful. The histological examination of the right tube, removed because of nodular inflammatory changes showed productive caseous tuberculosis.

Injuries to Superior Mesenteric Artery.

The injury to the mesenteric artery is so extremely rare from the clinical point of view that, among over 10,000 reported abdominal injuries of war and civilian life, not one such case could be found that had been subjected to laparotomy and survived. The severe hemorrhage leads to the death of the victim before he can reach an operating theatre. In addition to the severity of the injury itself it is always associated with other lesions. The operation consists by necessity in resection of the entire ileum, the greatest portion of the jejunum and possibly of the right side of the colon. Should the patient survive such an extensive procedure he will be subject to the short circuit or deficiency syndrome which often follows these massive resections.

We observed recently a case of gun shot wound of the abdomen with all the above mentioned conditions and complications and with favorable outcome.

Case 7: 2926/54, M.V.G. This 13 year old boy was admitted to the Glace Bay General Hospital a few minutes after being shot accidentally in the abdomen from a distance of 5 feet. The 0.22 rifle bullet had entered the abdomen half an inch to the right of the midline between xyphoid and umbilicus. A scout film of the abdomen showed the bullet in the midline in front of the third lumbar vertebra. In spite of plasma and blood transfusions the blood pressure dropped rapidly. A laparotomy was done one hour after the accident. The blood could be seen welling up from a small tear at the upper end of the mesenteric root just in front of the jejuno-duodenal flexure. An extensive hematoma occupied the entire retroperitoneal space. The small bowel and the right side of the colon were greyish, pale and no pulsation could be felt in the vessels of the mesentery. The aorta was compressed digitally and the small hole in the posterior peritoneum enlarged. The superior mesenteric artery was found torn across the entire diameter except for a very thin band on one side. The superior mesenteric vein was apparently uninjured. The two large vessels were ligated and the pressure on the aorta released. Immediately after opening of the abdominal cavity the pulse and the blood pressure had become undetectable. Rapid blood transfusions did not improve the condition until the hemorrhage was controlled. Following the ligation the pulse reappeared, though of poor quality. With the gradual restoration of the blood pressure the colour of the abdominal organs improved. The first $2\frac{1}{2}$ feet of the jejunum recovered completely and pulsations returned to this portion of the bowel. The distal section of jejunum as well as the entire ileum and the right side of the colon including the hepatic flexure remained ischemic. The left colic artery from the inferior mesenteric artery took over the arterialisation of the transverse colon. The affected bowel was resected and the jejunum $2\frac{1}{2}$ feet distal to the ligament of Treitz anastomosed to the midportion of the transverse colon. Wounds made by the bullet in its course through the upper abdomen also were found in the anterior and posterior wall of the third portion of the duodenum and the stomach. They were dealt with in the usual manner. During the 74 minutes of the operation the patient had received three more bottles of blood bringing the total of replacement fluid from the time of the injury up to three units of plasma and four units of blood.

Except for a short-circuit syndrome which presented some difficulties in management during the first two weeks the postoperative course was uneventful. Three months later the patient had already gained 26 pounds and felt well.

This patient is interesting in more than one respect and shows first, that intraabdominal large vessel injury need not be fatal if received in an operating room within a reasonable time and if blood and plasma are used immediately and in adequate amount, second, that extensive resections are necessary and tolerated well by healthy individuals and third, that the small bowel syndrome, even when of extreme degree, may only be transient and may not lead to permanent disturbance of health.

During the second world war three to five percent of the abdominal injuries did not reach the field hospitals. The overall mortality in large series of abdominal injuries fluctuates between 12% (Rohlf) and 53% (Gordon Taylor). About 80% (Welsh, Jones) of the deaths were due to hemorrhage, 36% in small and 87% in large hemorrhage (Mason). If hemorrhage was given as the cause of death it nearly always came from the large veins, e.g. the vena cava or vena portae. Only Aalpoel found a patient to have the tip of one fragment penetrating the wall of the aorta being partially embedded within its wall.

Mesenteric Vascular Occlusion.

Mesenteric vascular occlusion, whether arterial or venous is followed by hemorrhagic infarction of the regional portion of bowel with congestion and edema and following gangrene.

The superior mesenteric artery and vein are the usual site of occlusion by emboli, thrombi or by ligation. Acute thrombosis in the inferior mesenteric artery is rare but was seen by the writer in a 78 year old patient with fecal impaction and gaseous distension.

The diagnosis is often not made before laparotomy but sudden severe abdominal pain, especially if occurring a few days after an operation, shock like condition, melena and a more or less distended, tender and rigid abdomen should the examiner make suspicious of such a catastrophe.

The prognosis of the operatively treated cases has improved considerably in the last years, primarily due to the better understanding of supportive therapy pre and postoperatively, gastrointestinal suction to relieve distension and blood and fluid replacement to combat shock. Attention to electrolyte balance is most important. Early resection of the bowel regardless of extent is the only treatment promising success. A method other than resection of the bowel would be arterial replacement, anastomosis or embolectomy. Reconstruction of a superior mesenteric artery in men has already been done by De Bakey. Embolectomy has been described by Klass with the bowel viable 48 hours after the operation. Death was due to acute cardiac failure.

Extensive studies on the feasibility of the splenic and left renal artery to replace the first portion of the superior mesenteric artery were conducted on dogs by Hurwitt and co-workers and gave promising results. No use has been made of this method in men so far.

Rabinovici and Fine have shown that the broad spectrum antibiotics have improved considerably the results of experimental mesenteric artery anastomosis. Local intraarterial heparin, as one injection at the time of the operation should be given a trial but is not very effective for the prevention of thrombosis at the anastomosis site. The intraarterial drip of heparin recommended by Freeman is for obvious reasons not applicable for surgery on intraabdominal arteries. Intravenous heparinization carries with it the risk of serious hemorrhage from bleeding lesions elsewhere and at the operative site.

Retroperitoneal Hematoma.

The two principle types are (a) traumatic and (b) nontraumatic. The traumatic retroperitoneal hematoma may be closed or open. The closed type is most often seen with pelvic and vertebral spine fractures or lacerations of the kidney. The atraumatic variety of the closed hematomata is represented by rupture of an aneurysm of the abdominal aorta or its branches.

The diagnosis can easily be made from the presence of a mass deep in the abdomen or in one or both flanks. The psoas shadow is nearly always obliterated, the diaphragm is high and sometimes on x-ray a disc-shaped atelectasis can be seen at the base of the ipsilateral lung (Bruckschwaiger), Anemia and a leucocytosis are always present.

It is still a good attitude to treat these retroperitoneal hematomas conservatively unless there is evidence, that a large vessel is torn and bleeding continues or unless the position of the hematoma and other signs indicate a possible injury to the ureter, posterior wall of colon, rectum, duodenum or bladder. In our case No. 7 the indication for an operative intervention was clearly given by the severe hemorrhage and the injury to the intestinal tract. A severe hemorrhage into the retroperitoneal space may not be fatal immediately, even if the source is a ruptured aneurysm of the abdominal aorta. Bahnson was able to carry out a resection of the abdominal aorta distal to the renal artery and including the bifurcation as an emergency measure with survival of the patient. Ferrar performed two successful resections of ruptured abdominal aneurysms and Shaw reported from the Massachusetts General Hospital three survivals in eight patients. In all of them the aneurysmatic abdominal aorta had been resected and grafted. Most of the fatalities were due to renal shutdown as a sequence to the hypotension prior to and during operation.

Within the last two years we have observed three patients with sudden nontraumatic retroperitoneal hematoma, one from rupture of a renal artery aneurysm and the other two from a leak in an aneurysm of the abdominal aorta. In all three the prominent feature was the severe shock and, though all of them lived longer than three days following the onset of the hemorrhage they were never considered more than extremely poor risks for operation. However, since the prognosis of untreated patients is hopeless emergency resection and grafting for ruptured abdominal aortic aneurysm is justified.

Injuries to Peripheral Large Arteries.

Injuries to large arteries of the extremities should no longer be treated exclusively by ligation. Recent development of suture methods, suture mat-

erial, grafting and the use of prostheses have reduced the incidence of gangrene of an extremity considerably. It is the surgeon on the battle field and the general surgeon in the civil hospitals who is confronted with these cases and who should now be able to use these means and methods. The amputation rate in ligation of the common femoral artery was 80% and following repair by anastomosis or grafting 25% (De Bakey). The respective figures for the axillary artery were 45% and 10%. Back-bleeding is not an infallible criterion as to whether an extremity would survive arterial ligation. Spencer and Grewe observed good to fair back-bleeding in 9 out of 20 extremities that subsequently became gangrenous. Furthermore have the studies of De Bakey and Simeone disproved the claim that simultaneous ligation of veins reduced the incidence of gangrene in extremities where arterial ligation was carried out. Even if arterial repair would guarantee a circulation sufficient only for some eight days, it would serve its purpose because secondary ligation after that time limit only rarely results in loss of the extremity. It is a well known fact that gradual onset of vascular occlusion allows for the development of collaterals.

Case 8: 1720/46, F.G. This 16 year old butcher apprentice suffered a severe injury to the right external iliac artery when, on Dec. 23, 1946, while skinning beef, his knife slipped and entered deep into the right inguinal region. The hemorrhage was stopped a few seconds later by fist pressure by a fellow worker until a general practitioner arrived who enlarged the stab wound and placed two Kocher clamps above the suspected site of injury. The severely shocked youth was then brought to the General Hospital Waidhofen/Ybbs where he was operated on immediately. The Kocher clamps were replaced by bulldog clamps and the external iliac artery which was nearly completely severed was repaired. The pulse, sensation and muscle power returned to the leg shortly after release of the clamps and after intra-arterial papaverine injection. The Kocher clamps had done considerable damage to the vessel wall and a fascial graft was placed around this area as reinforcement. In the absence of antibiotics a wound infection complicated the postoperative course. For fear of secondary hemorrhage continuous watch was held at the patients bed side. On Jan. 1st. 1947, eleven days after the injury, fresh blood began to ooze from the incision. The external iliac artery was then ligated about one inch above the wall necrosis which had developed at the site of the original clamp compression. A lumbar sympathetic block with Novocain was done at the same time. There was no change in the viability of the extremity immediately after the ligation though the pulse could no longer be felt in the dorsalis pedis artery. Except for slight weakness in this leg there were no complaints and patient could resume his occupation two months later.

Recently Spencer reported a similar case from the Korean front. The patient recovered from a ligation of the common femoral artery eleven days after anastomosis with normal function of the leg.

Peripheral Arterial Embolism.

In spite of many articles dealing with the controversy between operative treatment of peripheral arterial embolism and conservative measures as recommended by Haimovici such controversy is only apparent. Each one of the

recommended methods has a field of its own. Conservative measures like the use of heparin, vasodilator drugs and sympathetic nerve interruption have been credited with failures in cases where they have only been used because poor general condition and delay have made an operation obsolete. On the other hand death due to heart failure and recurrent emboli have been blamed on embolectomy, even if performed successfully with preservation of an extremity.

The present trend is more in favour of a stricter selection of cases for the respective type of treatment. Embolism in arteries distal to the popliteal and cubital artery are managed better by conservative measures. If the embolus lodges proximal to these levels and the extremity shows severe signs of circulatory disturbance such as pain, loss of motion, numbness and coldness and if improvement of collateral circulation does not follow sympathetic novocain block no time should be wasted with further conservative measures. In the writer's experience the hours the internist used up for conservative treatment determined usually the success or failure of the operation. Once embolism is suspected a consultation between the medical man and the surgeon is in order and should not be delayed. Local spasm of the main vessel at the site of the embolus, reflex spasm of the collaterals and retrograde thrombosis will lead to irreparable ischemia within four to six hours. If for technical or other reason an embolectomy can not be done within the critical time the limb should be packed in layers of ice cubes with the intention to reduce the temperature of the extremity to about 75 degrees Fahrenheit. Thus the oxygen requirements of the tissue will be reduced and the damaging effect of anoxia delayed. However, it should remain the surgeon's aim to operate within the four hour period. After the operation the affected part should be kept at room temperature to reduce metabolic needs, while warming the rest of the patient to promote reflex vasodilation.

The differential diagnosis between the early stages of arterial embolism and ileo-femoral thrombophlebitis is sometimes difficult. In both there may be sudden onset of pain, pallor, coldness, tenderness in the inguinal region, absence of pulse and delay in the filling of the veins. A reliable sign of embolism is the early pinched appearance of the tip of the extremity involved in contrast to slight edema in ileo-femoral thrombophlebitis. Elevation increases the pallor in embolism while it does not cause noticeable changes in the colour in thrombophlebitis.

The localization of the embolus may present difficulties because pain is not a reliable sign. The pain is usually diffuse and is more due to the ischemia and reflex vasospasm rather than due to the local irritation of the vessel by the blood clot. The sites of bifurcations should be suspected first. By judicious palpation of the main artery from distal and proximal the site can usually be determined. In arteries accessible to palpation like the common and superficial femoral artery, and the axillary and branchial artery, the occluded segment appears to be thickened and the thud can be felt to be more of a lengthening than expanding nature. Dye and co-authors believe that all patients should be explored if there is any doubt as to differentiation between thrombosis and embolus. An acute arterial obstruction unrelieved by the release of arterial spasm should be surgically explored, particularly when it can be done under local anesthesia and with little risk to the patient.

The possibility of new emboli from the primary source should not deter from operation. Repeated embolectomies on one and the same patient have been done successfully (Scott, Cullum, Bruckschwaiger). The following case has been reported previously in another connection.

Case 9: 750/45, C.K. This 77 year old female had been admitted on April 29, 1945 to the Medical Department of the General Hospital Barmbeck in Hamburg for treatment of erysipelas of the left lower leg and congestive heart failure with auricular fibrillation and mitral insufficiency. The patient responded well to sulfa drugs and digitalis and was well compensated when, on May 19 she was awakened by a severe pain in the right arm with coldness, loss of power and numbness. The hand and the distal half of the forearm were pale, cold and there was no pulse in the radial, cubital and brachial artery. The pulse in the supraclavicular artery was strong and normal. The axillary artery was exposed under local anesthesia and a three cm long embolus was removed. Because of considerable local spasm of the artery and further absence of the peripheral pulse 60 mgm of papaverine were given intraarterially. There was nearly immediate return of pulse and restoration of sensation within a few minutes. The patient rested comfortably thereafter but was awakened again three hours later with the same symptoms as before only this time in the left arm. The diagnosis of arterial embolism into the left axillary artery was made and, under local anesthesia an embolus was removed from the left axillary artery. The patient was well two years later with full use of both arms.

This case and similar experiences with femoral and iliac artery embolisms demonstrate very convincingly that intraarterial papaverine injection and paravertebral sympathetic blocks are supplementary and not alternative procedures, the first one acting on the myogenic (Meyer), the last one on the neurogenic component of the vascular spasm.

Other attempts to improve the results of embolectomies have been made. Very interesting and promising work has been done on dogs by Gordon et al., who could achieve a high level of heparin in one extremity by infusion of heparin into the artery of the extremity. General heparinization was prevented by the simultaneous infusion of protamine into the vein of the same extremity. Further work will show whether this method can be applied to men where it would be used during the first few days after embolectomy, endarterectomy and other operations on arteries of the extremities.

It has already been mentioned that a great number of patients succumb to further embolisms, even if the removal of the first embolus should prove to be successful. The following is a typical example of such tragedy.

Case 10: 630/55, O.R. This 47 year old female was admitted to Glace Bay General Hospital on March 12, 1955 with a history of hemiplegia of the left side of face and body. The presence of mitral stenosis as well as considerable improvement of the paralysis shortly after Novocain injection into the right stellate ganglion made the diagnosis of cerebral embolism certain. Two days later she was struck with a sudden, severe pain in the right shoulder and arm, followed by pallor, coldness and loss of sensation and muscle power in the arm. The pulse was absent in the axillary artery and distal to it and could be felt in the subclavian artery in its supraclavicular portion. A stellate block was done. No improvement in the circulation of the arm was noted. Three

hours after the embolism the right subclavian artery was exposed under local anesthesia and an embolus of 25 by 6 mm was removed. The colour of the hand became normal and sensation returned within 15 minutes. The functional result appeared to be satisfactory though the radial pulse did not return. On the third postoperative day the patient suffered another cerebrovascular accident with hemiplegia of the right side. She became comatous and died the following day. It can be assumed that the last attack was an embolism too.

Technique of Embolectomy.

Local anesthesia is nearly always feasible and often imperative with regard to the patients general and cardiac conditions. The involved artery should be exposed by a long incision. A Penrose rubber drain or umbilical tape is pulled through below the artery proximal and distal to the embolus. The vessel is opened by a longitudinal incision of about 2 cm length, The incision is made over the midportion of a short embolus or, in the presence of a long embolus or secondary thrombosis nearer to the distal end. After releasing the tension of the distal tape the distal end of the embolus is milked gently towards the opening with the finger until it appears to be freely projecting. The proximal tape can then be slackened and often the blood stream itself will eject the embolus. If it is adherent the insertion of a soft rubber catheter connected with low pressure suction will help detach it. Saline irrigation of the vessel distal and proximal can be done. The blood should spout freely and forcefully from the artery. Now 25 mgm Heparin in saline is injected into the distal artery segment. At any time during the operation the elevation of the proximal tape will easily control hemorrhage. The incision in the vessel is finally closed by Nr. 5-0 arterial suture, the stitches taking all layers at the very margin. Continuous over and over suture is preferable. Pressure with the finger for a few minutes will take care of small leaks in the suture line. Now 60 mgm of Papaverine is injected into the artery proximal to the suture and the effect recorded at the periphery.

Traumatic Arterial Thrombosis.

A trauma, sufficiently severe to cause thrombosis in large arteries, will also affect the surrounding tissue. This is the reason why these injuries, usually of the crushing type, have such a poor prognosis as to the survival of the limb. This is certainly true for wounds in the popliteal and cubital region. Often the neuro-vascular bundle is exposed for a long distance, the collaterals are torn, the vessel wall severely contused showing extensive subintimal hemorrhages, muscles are lacerated and the surrounding skin is ischemic from pressure and poor blood supply. Infection may complicate the picture later on.

Case II: 2559/54, S.F. This 48 year old miner was admitted to St. Joseph's Hospital on September 27, 1954 with injuries received in an underground accident. He had been crushed between the wall and a run-away coal car. Besides multiple severe injuries to the pelvis, spine and bladder he also had suffered a crushing injury of the left shoulder with wide exposure of the entire subclavicular and axillary space, with rupture of the major pector-

alis tendon and exposure of the neuro-vascular bundle in the subclavian fossa. The subclavian artery showed signs of bruising and was pulseless. The arm was cold, pale, rigid and without sensation. Two and a half hours after the injury the wound was cleaned, necrotic tissue excised and a 4 cm long thrombus removed from the axillary artery. Pulsation appeared in the cubital artery, however the hand and forearm remained ischemic. Intraarterial papaverine and heparin and stellate block were of no help. The patient died 10 days later from the other injuries.

The cause for the failure of thrombectomy or intimo-thrombectomy is probably the rapid formation of retrograde thrombi. It is a well known fact that retrograde thrombosis occurs much more readily with traumatic thrombosis than with embolism. Substances, liberated at the site of the trauma appear in the blood of the vessel distal to the gradually growing thrombus in concentrations, much higher than in cases of arterial occlusion of other than thrombotic origin. Furthermore concomitant crushing injuries to other parts of the body may contribute to an increased coagulability of the blood. The role of anticoagulants systemically and locally has been considered elsewhere in this paper.

Conclusions.

Vascular emergencies met by the general surgeon are still marred by a great number of poor results and a great number of lost extremities.

The most important single factor responsible for this sad fact is the time interval between onset and recognition of the vascular accident. All too often the absence of pulse, the livid colour of the skin, the coldness of the extremity and the loss of sensation and function escapes the examiner. All too often complicated methods of examination and time consuming tests delay treatment in cases which the seeing eye and the gentle finger alone could diagnose correctly. Other, less important factors are hesitation of the surgeon to operate, even if the emergency has been recognized, delay due to use of conservative methods over a prolonged period of time and last the failure of the surgeon to observe the basic rules in vascular surgery.

An effort has been made to present the most common problems in this field of surgery on hand of actual case reports. It has been shown that the general surgeon has a definite responsibility in recognizing and treating vascular emergencies.

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X-Ray Hazards In Present Day Diagnostic Radiology

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EXCESSIVE dosage of X-Rays and other High Energy Radiations have been known to be a hazard to man for some forty years. Radiologists were first aware of this when some developed irradiation dermatitis of the hands, several requiring amputations of the fingers and later some developed epidermoid carcinomas. As time went on, it appeared that there were more insidious somatic effects to excessive radiation, such as a higher incidence of leukaemia and a shortened life span due to premature aging. H. J. Meuller, Professor of Genetics, Indiana University, and others, have repeatedly pointed out the genetic effect of irradiation.

Since in the early years of X-ray, radiologists were the chief people receiving excessive dosage, they were the first to note these changes. But as X-ray procedures became more common and urologists and gynecologists began to receive larger doses and a greater proportion of the general population were having more and more X-ray examinations and treatments, it became apparent that these hazards might affect a much larger proportion of the population and, therefore, the problem was investigated. We now have reports of the Scientific Committee on the Effects of Radiation of the General Assembly of the United Nations, the National Academy of Sciences, the International Commission on Radiation Protection and the Committee on Standards, Units and Protection of the Canadian Association of Radiologists. These reports indicate that a thorough study of the problem has been made and, while nothing new has been pointed out, nevertheless, they create a general awareness of the hazards of excessive irradiation.

Diagnostic X-ray examinations are now the greatest source of artificial radiation to which the general public is exposed. It should be emphasized that there is no indication that people receiving these examinations suffer any adverse somatic effect. But there is evidence to suggest that these procedures give rise to an increased number of mutations with a genetic effect upon succeeding generations. In addition, these reports confirm the well recognized fact that there is a very definite somatic hazard to the irradiation worker when the dosage is allowed to exceed the permissible level of 0.1 roentgens per week.

These hazards may be minimized or completely eliminated by the following:

GENETICS: Patient and operator under 30 years of age

1. gonadal shielding.
2. improvements in techniques and equipment to avoid radiographically wasteful irradiation.
3. higher standards of training of technical personnel with emphasis on factors related to patient and operator protection.
4. avoidance of fluoroscopy as much as possible.
5. a system of recording the amount of radiographic exposure being instituted — a radiation diary.

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SOMATIC DOSE: Patient and operator in any age group.

1. it is obvious that the somatic dose to the irradiation worker must be reduced and kept below an average monitoring dosage of 0.1 roentgens per week.
2. it is also quite obvious that the only permissible dose to the patient or operator is the lowest possible dose even though there is no risk of adverse somatic effects.

THE USE OF CHLORPROMAZINE IN OCULAR SURGERY*

The use of Thorazine in ocular surgery has been studied in 22 psychotic patients and 23 non-psychotic patients who have undergone major ocular surgery.

Preoperatively, Thorazine was found to calm and relax the patient, reduce anxiety and apprehension, and lessen the amount of sedation and analgesia required.

During the operation the drug lessened restlessness, controlled vomiting, hiccoughs, and postoperative confusion.

Used in small doses of 25 to 75 mg. daily for short periods of 24 to 48 hours, it was essentially free of toxicity and was a highly effective and desirable adjunct to ocular surgery.

Byerly, B. H., Murray, R. G., Winter, F. C., Vitols, M. M., North Carolina Medical Journal. 16: 470-473, October, 1955.

*From Medical Abstracts, April, 1956.

DIETARY ADJUSTMENT AS AN AID TOWARD LENGTHENING LIFE FOLLOWING CORONARY OCCLUSION*

This reports on the recent work of Morrison who studied 100 patients with coronary atherosclerosis as manifested by an attack of coronary occlusion. Fifty of these patients were treated with a low-fat, low-cholesterol diet, while the other 50 were permitted to maintain their usual eating habits thus serving as control. With the exception of diet, the treatment of each group was identical. Other variables between the two groups were similar including age, extent of estimated coronary damage, etc.

At the end of eight years, it was shown that the diet patients had lower serum lipid levels and decreases in body weight.

Of the 50 control patients, only twelve were living eight years after their infarcts. Thirty-eight had died, mainly from cardiovascular disease. Of the original 50 dietetically treated patients on low-fat, low-cholesterol diets, 28 were still living. Thus, there was a 24 per cent survival rate in the control group, while the group on controlled diets enjoyed a rate of 56 per cent.

Bulletin of the Biological Sciences Foundation, Ltd., 1-4, March-April, 1956.

*From Medical Abstracts, April, 1956.

The Reduction of Radiation Exposure In Practice At The Victoria General Hospital, Halifax.

On account of the ever increasing utilisation of sources of radiation, the problem of protection nowadays calls for consideration of not only the operator, but also the patient and general public. The maximum permissible weekly dose recommended as an occupational exposure is now 0.1 roentgens/week, whilst for the general public this should be reduced by a factor of 10 to 0.01 roentgens/week. These factors must be borne in mind by those responsible for protection against radiation.

The recent extensions to the Radiological Department at the Victoria General Hospital required careful attention to details in protection design, and afforded an excellent opportunity to carry out a comprehensive survey of the protection provided for all staff, and the means available for reducing patients dosage during examination. The following observations are made after surveying one radiographic room to determine the worst possible radiation hazards, even though such hazards would never be encountered during normal practice. For example, the protective value of doors, floors and walls was measured by aiming the X-ray beam directly at them, without allowing it to pass through any absorbing body, equivalent to a patient.

From the operator's point of view, there are two problems to be dealt with, namely those during radiography and fluoroscopy. Assuming that the operator is always positioned behind the protective barrier during radiography, the worst condition obtained by pointing the X-ray tube at the operator behind the barrier would allow a total exposure of 18,000 milliamperes-seconds per week before the maximum permissible dose is reached. This is equivalent to 600 complete PA and Lateral chest examinations. However, this would be reduced to 1/8th., if the X-ray tube were ever angled in such a manner that the worst possible condition of scattering from a wall or ceiling into the control booth existed. Radiography could not be performed under such conditions in the room investigated, but the results indicate that protection of the operator must be considered against scattered radiation as well as direct radiation. To do this, the positioning of the control booth must be decided upon not only to give the best field of view, but also taking into account the possibility of an X-ray beam being angled in such a manner as to be scattered into the booth.

Measurements under fluoroscopic conditions showed the main hazard to arise from scatter originating both from the table top and the patient. The highest doses recorded at the edge of the table would allow only 8 minutes of actual fluoroscopy per week **without** a lead rubber apron. The effect of wearing such an apron (equivalent to 1 mm. lead) would be to increase this time to at least 80 minutes. Timers on the fluoroscopic units in the department show from 3 to 5 minutes actual fluoroscopy per examination, so 80 minutes would permit 20 examinations per radiologist per week. The dose transmitted through the lead glass screen constitutes a lesser hazard, and the highest radiation intensity noted would permit at least 5 hours fluoroscopy per week. It must be remembered that these results were obtained under the worst possible conditions, with both maximum field of viewing and tube kilovoltage available.

The protection afforded by the doors, walls, floor and ceiling concerns not only the radiology staff, but also other hospital personnel who should not receive radiation in excess of that recommended for the general public. It was found that door and wall protection was such that even under the worst condition of direct radiation, a total exposure of 2,400 milliamperes-seconds per week was permissible, or 80 complete chest examinations. The floor and ceiling protection however was such that at least 10 times this amount of work could be done before office personnel above and below would receive 0.01 roentgens.

Finally the question of exposure of the patient during examination was investigated. Apart from the obvious reduction in exposure achieved by keeping the X-ray beam to a size compatible with the area to be examined, further reduction may be obtained by using aluminum filters in the X-ray beam, and higher tube kilovoltages. In the radiological examination of a typical patient's abdomen, the effect of adding a 2 mm. aluminum filter in the X-ray beam is to reduce the patient's exposure by as much as 40 per cent. Similarly an increase from 75 to 100 kilovolts peak on the X-ray tube can reduce the patient's exposure by 50 per cent.

These examples show how it is possible by technical means to minimise radiation exposure of both the general public and radiation workers. Ultimately one has to reach a compromise, balancing any further reduction in exposure against loss of diagnostic detail, ease of examination, structural difficulties and financial considerations.

The one guiding principle however is that all unnecessary exposure should be avoided.

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The Responsibilities of the Medical Profession In the Use of X-Rays And Other Ionizing Radiation

Statement by the United Nations Scientific Committee
on the Effects of Atomic Radiation

1. The United Nations General Assembly, being aware of the problems in public health that are created by the development of atomic energy, established a Scientific Committee on the Effects of Atomic Radiation. This Committee has considered that one of its most urgent tasks was to collect as much information as possible on the amount of radiation to which man is exposed today, and on the effects of this radiation. Since it has become evident that radiation due to diagnostic radiology and to radio-therapy constitutes a substantial proportion of the total radiation received by the human race, the Committee considers it desirable to draw attention to information that has been obtained on this subject.

2. Modern medicine has contributed to the control of many diseases and has substantially prolonged the span of human life. These results have depended on part on the use of radiation in the detection, diagnosis and treatment of disease. There are, however, few examples of scientific progress that are not attended by some disadvantages, however slight. It is desirable therefore to review objectively the possible present or future consequences of increased irradiation of populations which result from these medical applications of radiation.

3. It is now accepted that the irradiation of human beings, and particularly of their germinal tissues, has certain undesirable effects. While many of the somatic effects of radiation may be reversible, germinal irradiation normally has an irreversible and therefore cumulative effect. Any irradiation of the germinal tissues, however slight, thus involves genetic damage which may be small but is nevertheless real. For somatic effects there may however be thresholds for any irreversible effects, although if so these thresholds may well be low.

4. The information so far available indicates that the human race is subjected to natural radiation,¹ as well as to artificial radiation due to its medical applications, to atomic industry and its effluents and to the radioactive fall-out from nuclear explosions. The Committee is aware of the potential hazards that such radiation involves, and it is collecting and examining information on these subjects.

5. The amount of radiation received by the population for medical purposes is now, in certain countries, the main source of artificial radiation and is probably about equal to that from all natural sources. Moreover, since it is given on medical advice, the medical profession exercises responsibility in its use.

¹ The radiation due to natural sources has been estimated to cause between 70 and 170 millirem of irradiation to the gonads per annum in most parts of certain countries in which it has been studied, although higher values are found locally in some areas. See the reports "The hazards to man of nuclear and allied radiations" published by the United Kingdom Medical Research Council in June 1956, in which also the Millirem is defined; and from information submitted to the Committee.

6. The Committee appreciates fully the importance and value of the correct medical use of radiation, both in the diagnosis of a large number of conditions, in the treatment of many such diseases as cancer, in the early mass detection of conditions such as pulmonary tuberculosis, and in the extension of medical knowledge.

7. Moreover, it appreciates fully the contribution of the radiological profession, through the International Commission on Radiological Protection² in recommending maximum permissible levels of irradiation. As regards those whose occupation exposes them to radiation, the establishment of these levels depends on the view that there are doses which, according to present knowledge, do not cause any appreciable body injury in the irradiated individual; and also on the consideration that the number of people concerned is sufficiently small for the genetic repercussions upon the population as a whole to be slight. Whenever exposure of the whole population is involved, however, it is considered prudent to limit the dose of radiation received by germinal tissue from all artificial sources to an amount of the order of that received from the natural background radiation.

8. It appears most important therefore that medical irradiations of any form should be restricted to those which are of value and importance, either in investigation or in treatment, so that the irradiation of the population may be minimized without any impairment of the efficient medical use of radiation.

9. The Committee is consequently anxious to receive information through appropriate governmental channels as to the methods and the extent by which such economy in the medical use of radiation can be achieved, both by avoiding examinations which are not clearly indicated and by decreasing the exposure to radiation during examinations, particularly if the gonads, or the foetus during pregnancy lie in the direct beam of radiation. It seeks, in particular, to obtain information as to the reduction in radiation of the population which might be achieved by improvements in instrument design, by fuller training of personnel, by local shielding of the gonads, by choosing appropriately between radiography and fluoroscopy, and by better administration arrangements to avoid any necessary repetition of identical examinations.

10. The Committee also seeks the co-operation of the medical profession to make possible an estimate of the total radiation received by the germinal tissue of the population before and during the child-bearing age. It considers it to be essential that standardized methods of measurement, of types at present available, should be widely used to obtain this information and it emphasises the value of adequate records, maintained by those using radiation medically, by the dental profession, and by the responsible organizations in allowing such radiation exposure to be evaluated. The Committee is convinced that information of this type will make it possible to decrease the total medical irradiation of the population while preserving and increasing the true value of the medical uses of radiation.

² See the report of the International Commission on Radiological Protection (published in the *British Journal of Radiology*—Supp. 6, of December 1954—in the *Journal français d'électro-radiologie*—No. 10, of October 1955.—etc. and revised in 1956).

Providing A Psychiatric Service To A Community

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THIS spring, Dr. Jack Griffin, the General Director of Canadian Mental Health Association, attempted to forecast what will be the pattern of treatment services for the mentally ill in Canada. He said:

"Certain vigorous trends can be identified. With the increase in diagnostic and therapeutic skill, psychiatry will move even closer to general medicine. The large, and often remote mental hospitals, will give way to smaller regional hospitals designed to serve the people in the community in which they are placed. They will be located in close proximity to general hospitals and medical teaching centres. Mental hospital care will be adapted to the special needs and capacities of the patients and will include community (out-patient) clinics, day and night services, and the ever expanding use of open wards. The useful and gainful employment of patients will be increasingly encouraged.

What of the chronic, "continued treatment" patients — of senile, deteriorated patients? The number of these will be reduced by active early treatment to a hard residual core who will be still cared for in their own mental hospital or convalescent wing of that institution.

I see the small, local hospital as the centre of a co-ordinated mental health program in the community. It will be closely linked on the one hand with the people of the community it serves through voluntary citizen participation. On the other hand, it will be closely related to other hospital and medical facilities, permitting an inter-relationship and an inter-change of medical and professional staff.

In fact, our immediate problem in looking ahead is not so much **what** will happen but **how** we can best bring it about."

PROBLEM. One might naturally wonder why Dr. Griffin was so definite in making his prediction. Therefore it might prove useful for us this morning to review the mental health **problem** as it presents itself and to consider why, at a time when many other medical services are centralized, decentralization of mental health services should seem so important. Probably the most important deciding factor is the increasing realization of the magnitude of the mental health problem. Twenty-five years ago, in our province, important methods of treating the most severe forms of mental illness were introduced at the Nova Scotia Hospital. Since then, methods of treatment have multiplied and given new hope for the mentally ill. At the same time, there has been an increasing obligation for psychiatrists to become more familiar with various kinds of mental illness, in a practical way, so as to apply the most suitable forms of treatment in different cases. Gradually, with improved prognosis, more persons have applied for help at the mental hospital and have been willing to entrust us with confidences regarding the depth of their feelings of despair

*Paper delivered at Canadian Public Health Association Meeting, Kentville, November 9, 1956.

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and dread, the uncanny awfulness that is experienced by the disordered mind. A rather profound understanding of personality and its problems had been learned by philosophers and psychologists a century and more previously. What our generation is learning is more the wide-spread prevalence and seriousness of psychological and emotional problems and the very real effect that these have upon the health and efficiency of even the average man. Admissions to the Nova Scotia Hospital have risen from an annual figure of 500 in 1948 to an estimated figure of 1,000 for the current year. Suggested reasons for this, in addition to the fact of a growing total population, might be the increasing acceptance of the idea of treatment for at least the major psychotic illnesses and the fact that in our increasingly complex society, the stress upon the individual is greater and the tolerance for the misfit is less. For these and other reasons, we are faced with the need to treat an increasing number of persons with major psychosis.

This however, would seem to be a relatively small part of the problem. General practitioners and others in the community now recognize that there are numerous psychiatric problems seen in everyday practise. A survey was made in New York City under the direction of the Payne Whitney Clinic of the New York Hospital and it was found that about half of a random sample of the population were at times incapacitated by illnesses in which psychological factors played a major part. A very similar survey in our own country has demonstrated a practically identical situation. It is difficult to convey these facts in terms of percentages and it might mean more to say that the most lasting impression one gets from a careful story of the detailed results of these surveys is that the happy individual and the happy family are great rarities in the world of today. People constantly express surprise that almost 500 persons have been referred to Fundy Mental Health Centre since its inception in September a year ago. But, seen in perspective, one may assume that this figure is much more indicative of the number of people optimistic enough to feel that they could be helped, rather than giving an indication of the prevalence of disturbance.

TYPES OF CASE. Having given some indication of the magnitude of the over-all problem, it is perhaps appropriate to consider the variety and kind of different problems that are presented. These include the so-called functional psychoses (schizophrenia and manic-depressive disorder), mental deficiency and other organic brain disorders, psychoneurosis with clear-cut symptoms of conversion, anxiety, or compulsiveness; and psychophysiologic disorders (such as certain cases of gastric ulcer, hypertension, asthma, headache, etc.). But most important, probably, are the host of non-conspicuous personality and marital problems. It seems that it is from these, as from a vast reservoir, that the acute, clear-cut syndromes of neurosis or psychosis frequently arise. For example, let us take the case of Mr. and Mrs. Smith. They are insecure, frightened people. Mr. Smith doesn't dare to discuss his business reverses with his wife for fear of her anticipated reaction. At home, he withdraws behind his newspaper and maintains a superficial air of serenity. Mrs. Smith craves attention and is deeply dissatisfied with the marriage, but she usually expresses this only in indirect ways, such as a sly gibe or a disparaging remark made at a social gathering where she is safe from retaliation. Both Mr. and Mrs. Smith are pre-occupied with their fears and hidden aspirations and resentments so that their effectiveness at work and in the community is rather impaired. All their friends appear greatly surprised when Mr. Smith

develops a major depressive reaction following a financial reversal, which in terms of his abilities, he could have quite easily overcome. His reaction seems understandable only when we consider the gradual piling up of latent feelings of resentment and his own withdrawal and inability to deal with his feelings and to explain how he has felt to his wife.

TYPES OF TREATMENT. There are certain rather mechanical treatments that have proven their usefulness in relieving the discomfort of the acute symptoms of neurosis and psychosis: — Beginning about 1930 with the introduction of insulin coma, then electro-coma treatment, and more recently the remarkably effective tranquillizing drugs.

There is however, in almost every case, an underlying personality and social adjustment problem that is likely to demand attention at one time or another. Staff of our large mental hospitals are all too familiar with the fact that mechanical treatment usually brings dramatic and rapid improvement, but that recurrences are prone to occur when the patient is returned to his home situation, unless attention is paid to the relation of the patient with those at home. The problem of the large mental hospital now is very largely the problem of re-admissions.

In this connection, one must remember also that a number of the functional psychoses present a cyclical phenomenon of recurring marked behaviour disturbance. These cases sometimes require brief treatment at frequent intervals, but when they are re-admitted to a mental hospital far from the patient's home they tend to remain in hospital on each occasion longer than is really necessary.

ROLES OF PSYCHIATRIC STAFF. In view of the problem as outlined above, and in view of the types of treatment available, the function of psychiatric staff would seem to come under two general categories: (a) the provision of the best modern mechanical treatments at the crucial time and in the more convenient location for the emotionally disturbed person; (b) more important, although less dramatic is the function in combatting trends in the patient's personality and within members of his family that seem to be self-defeating or disparaging. This requires a lot of listening, study and analysis of the minutia of the patient's personality and of his relations with others in his family and in his community.

In connection with both of these functions, there would seem to be an obvious advantage in setting up the psychiatric service in very close proximity to the homes and families of patients. There was a time when the mentally ill person was not at all understood; he was feared and the major purpose in taking him to hospital was not for treatment but for isolation and to protect the community from him. As treatment facilities have improved, we strive for the reverse of this. We try to deal with personality problems, e.g., at times of family crises; and when major symptoms do appear, we try to alleviate these with as little interference in the patient's life as possible, and whenever possible, without dislocating him from his family and job and community. It is felt that dislocation itself frequently adds to the insecurity of the patient. Also, it is very difficult to estimate how well a person is able to handle his problems when he is kept in the protected environment of the mental hospital. Repeatedly it has been found that the more rebellious patients at a mental hospital have been given a very bad prognosis and later events have shown that this assertiveness was of more value in the every day world than the sort of compliance and passivity that is likely to win praise within the confines of an institution.

RELATIONS WITH THE COMMUNITY. Being close to the community has fairly obvious advantages as far as providing service to members of the community who need it. It is hoped, in particular, that psychiatric staff will be able to assist the ordinary citizen toward an acceptance of the person with an emotional problem and even toward a better acceptance of his own occasionally disturbed feelings and emotions. This is just the opposite of isolation and custodial care for the mentally ill. It seems also to be connected with the need for a more frank appraisal of emotional problems generally with the implied need for a serious attempt at solution rather than to put them aside. I can assure you from personal experience that the prognosis of patients from certain families and certain neighbourhoods is much better than that from others, and this is not entirely on the basis of social class. In some neighbourhoods the seriousness of a problem is admitted and the persons involved are encouraged to continue to seek help, even when their treatment is tedious or when it demands tremendous efforts on their part. It is hard to estimate how important that kind of encouragement is at critical points in psychotherapy.

The treatment of problems of over-dependency, whether they occur in an institution or a community frequently require the co-operation of numerous associates of the patient in the treatment process. For example, the dependent person is prone to disparage his treatment and persons connected with it, members of his family, etc. If members of the community are willing to lend an ear to the kind of gossip he spreads, they make it that much longer before he would have to face his basic problem. On the other hand, if they would request him to express his grievances directly in words toward his therapist or toward the maligned member of his family, treatment could be more direct and quicker.

The community that is alert to mental health problems will remind itself of the need of fairness in dealing with one's fellow-man. The person with a purely psychological problem tends to feel rejected, inferior, and even persecuted. But there is such a thing as actual rejection and persecution, and this in turn produces psychological wounds that take a long time to heal. One is reminded particularly of the manner in which the community interests itself in the aged, in the sick and in those who are of less than average intelligence. It is fairly clear that some neighbourhoods and some communities are disparaging and promote mental illness whereas others are more fair, tolerant and fostering of mental health. Psychiatric staff would seem to have a particular obligation to act as a sort of catalyst generally in the community encouraging the process of mental health. For example, by demonstrating an understanding and respect for the person with an emotional problem he may provide useful consultation service to the general practitioner or internist, and to the surgeon. In this connection, it has been said that a surgeon can prevent more mental illness in the run of a week than a psychiatrist can cure in a lifetime.

Besides these general and rather subtle aspects of the relationship with the community, there is a very concrete and immediately practical aspect of the relationship between the community and the psychiatric service. And here I would refer in particular to our own experience in the Valley: — The community has provided a Board of Directors from among the members of the community to assume the total responsibility for overall policy, administration and financing of this service. Representatives were chosen from the Mental

Hygiene Society, Department of Health, and Acadia University Institute. While 90% of the necessary funds may come from government grants, it is most important that flexibility and provision for exceptional expenses should be provided by a local fund. A similar necessity has apparently arisen long previously in the history of treatment of tuberculosis, namely, The Tuberculosis Association of interested lay people. In the case of psychiatric services, it would sometimes be severely detrimental to delay a decision regarding administration or finances while the matter was considered through routine government channels for a matter of months.

The local Board of Directors is able to make decisions and to advise psychiatric staff regarding not only finance and administration but also a multitude of items, because they are chosen from the community itself and they are familiar with it. Each community has its own needs, its customs, and even its prejudices, and one must not be blind to that.

In Fundy Mental Health Centre, the Director of the clinic is the Secretary to the Board of Directors and, with his staff, has the responsibility of making the psychiatric services accessible to the medical profession, social agencies, schools, churches, etc., and in this connection he works closely with the general hospitals, the neighbouring county (mental) hospitals, and the mental hospital in Dartmouth.

Dr. Clyde Marshall is at present discussing with us a project to make Fundy Mental Health Centre a sort of clearing house for mental health problems in Kings County and vicinity. It is planned that only extraordinary cases would be sent to the Nova Scotia Hospital, and then with a close liaison and follow-up. It is proposed that our Social Worker should remain in touch with the family of the committed patient, beginning at the time of commitment. In this way, she would be of real service to the family at a time when they tend to need most help with their feelings, for example, with their grief at separation. In this way, also, she would become known as a friend and would be in a better position to be accepted as a follow-up worker. There are, however, problems of liaison in this regard with the referring general practitioner. The matter will be opened for discussion at the next meeting of the Valley Medical Society.

We have also discussed the setting up of a small psychiatric hospital, or other psychiatric unit, near to one of the general hospitals, to provide ease of consultation with other members of the medical profession. Important in this connection will be the provision of facilities for the care of ambulant patients, with recreational and occupational therapy. This will be especially for patients who do *not* require a hospital bed, but for whom a change of milieu for some part of the day is indicated. For example, a tense situation may have arisen between a wife and mother-in-law; and one or other may be developing rather serious signs and symptoms. Removal for a part of the day, with provision of a more constructive milieu, may help the patient regain confidence enough to take initiative in making a change in her situation at home. In other words, we wish to provide a maximum of service; but to combine this with the facilities already available to the patient in his own home, in the general hospital, or in the county (mental) hospital. In this way it is hoped to keep to a minimum the burden of cost of hospital beds without reducing the quality of care.

TUBERCULOUS MENINGITIS IN CHILDREN: A PREVENTABLE ILLNESS*

In reviewing the histories of 15 children who had tuberculous meningitis, the authors have emphasized that this complication of primary tuberculous infection could have been prevented in most cases. No simple primary lesion can be regarded as innocuous. The greatest danger of hematogenous dissemination occurs in the early years of childhood. Verhoeff and Peck have therefore advocated treatment with Isoniazid of all positive tuberculin reactors under the age of three, irrespective of the roentgen findings. It is believed that this would be an excellent prophylactic measure against tuberculous meningitis.

The more frequent use of a tuberculin skin test in office and hospital practice is desirable. With the possibility of tuberculosis and tuberculous meningitis in mind, a tuberculin skin test should be performed in any undiagnosed illness in childhood. Some cases of tuberculosis will then be discovered, and in those which show evidence of progressing to tuberculous meningitis, such a complication may be prevented by timely prophylactic therapy.

The disease may also be prevented by separating children with negative tuberculin skin tests from contact with open cases of pulmonary tuberculosis. Especially is this necessary during the first three years of life. Follow-up examinations and repeated tuberculin skin tests are necessary even after segregation. Only in this way will conversion of the tuberculin test to positive be detected. Prophylactic Isoniazid therapy can then be instituted.

When the diagnosis of tuberculous meningitis is made, it is important that immediate treatment be instituted. Such treatment should be given in a centre with adequate facilities and an experienced staff.

Verhoeff, D. and Evans, C., North Carolina Medical Journal. 17: 103-107, March, 1956.

THE DIAGNOSIS AND MANAGEMENT OF RHEUMATIC FEVER IN CHILDREN*

The diagnosis and management of rheumatic fever in children has been discussed. The most important single factor in the diagnosis of rheumatic fever from the history is the recurrence of beta haemolytic streptococcal sore throat.

Physical examination of the patient with rheumatic fever reveals a fair-skinned, delicate-featured individual with one or more of the major manifestations of arthritis, carditis, chorea, or the skin manifestations of erythema annulare or erythema nodosum.

The majority of laboratory studies used to aid in the diagnosis and management of the patient with rheumatic fever lack specificity and should be used only to aid in confirming the clinical diagnosis or impression.

Prevention and adequate treatment of the beta haemolytic streptococcal infection are at present the only available means of reducing the incidence of rheumatic fever and rheumatic-heart disease.

In spite of numerous innovations in therapy, there is no evidence of uniform response or control of the signs and symptoms of acute rheumatic fever nor is there any evidence to indicate a drug of choice.

The general care of the patient and the treatment of congestive heart failure as a complication of rheumatic fever are discussed.

Christian, J. R., Illinois Medical Journal. 109: 64-68, February, 1956.

*From Medical Abstracts, April, 1956.

Secretary's Page

Annual Meeting

The Executive Committee has approved the outline of the programme submitted by the Programme Committee under Chairmanship of Doctor D. E. Lewis, Digby. The dates are August 28, 29, 30 and 31st, with the Executive Committee meeting on the 28th and general sessions starting at 9.00 a.m., Thursday, August 29th. The delightful setting of The Pines Hotel in Digby will be very suitable for a programme which is well balanced, including business, scientific and social aspects.

Group Annuity or Group Pension Plan?

With the announcement of the policy of tax deferment in the Budget, deductions from Income Tax of payments toward Pension or Annuity plans are permissible. A recent communication from the General Secretary of The Canadian Medical Association indicates that study is already underway "to devise the best approach for the profession to the new situation." It might well be the "establishment of one or more group plans for physicians, either for the purchase of deferred group annuities, or the establishment of one or more trustee pension plans." There is a brief article relative to this in the April 1st issue of The Canadian Medical Association Journal. The suggestion is made that, remembering the advantages of Group Disability Insurance and Group Life Insurance, postponement of individual commitments should be made to await what the Group Plan will have to offer.

A communication has also been received from a company which states in part—"when the Government has implemented the Budget speech with detailed regulations, group contracts will probably be available, which would give each member approximately higher returns for each dollar contributed and would probably contain far less limitations and restrictions." Again, think it over.

Opposition to Chiropractic Act—Bill 82

On March 4, 1957, a communication was received from the Solicitor for the Nova Scotia Chiropractors Association, accompanied by proposed legislation, which was to be submitted to the present sitting of the Legislature. The letter requested review of the proposed legislation by The Medical Society of Nova Scotia, and implied willingness to modify it according to the views of The Medical Society of Nova Scotia. The whole matter was referred to Doctor J. McD. Corston, Chairman of the Committee on Legislation, who called a meeting of his nucleus committee and the results of these discussions were communicated to the other members of his Committee. As a result of prompt replies on part of those members recommendations were presented to the Executive Committee on March 18th as follows:

(1) "That the proposed legislation should be opposed by The Medical Society of Nova Scotia.

(2) "That this opposition should be based on inadequate training for the responsibility of diagnosis and consequently therapeutic measures thereby endangering the public health.

(3) "That since this proposed legislation is in effect to set up a Nova Scotia Chiropractic Association with power to grant registration through examination, your committee recommends that The Medical Society should

work in close association with the Provincial Medical Board, rather than initiate action on its own."

These recommendations were endorsed by the Executive Committee and the Secretaries of Branch Societies were notified and requested to canvass their membership or express the opinion of their Executive. It was unfortunate that the printed Bill was not available until Thursday, March 28th. It was sent to the Branches the next day. However, five of the nine Branch Societies, namely, Cape Breton, Western, Cumberland, Valley and Lunenburg-Queens, returned replies up to April 3rd.

On March 29 notification was received that the Bill, following Second Reading, had been referred to the Committee on Law Amendments, and that the "Public Hearing" would take place on April 3rd, at 10.00 a.m.

Concurrently, following the Executive Committee meeting, Mr. W. N. Wickwire, who had presented the brief for The Medical Society in 1953, was engaged as solicitor. Three meetings of the nucleus committee, enlarged to include representative thought of the profession, were held with the Solicitor, as a result of which a very satisfactory Brief was drawn up and submitted on April 3rd. The presentation was supported by an excellent summary of comparative educational qualifications by Dean Stewart, and three recent case histories. Doctors N. H. Gosse and S. R. Johnston were called by the Solicitor to answer questions. In addition to the three doctors names, six others were present to cover various aspects of the case, should their opinion be required.

At the time of writing this, the decision of the Law Amendments Committee is not known.

C.J.W.B.

"Bursary for Training in Clinical Pathology"

A Bursary covering training in Clinical Pathology leading up to certification in this subject will be available commencing in July, 1956. For further information interested parties are asked to write the Director of Radiological and Laboratory Services, Department of Public Health, Provincial Building, Hollis St. Halifax, N. S."

DALHOUSIE UNIVERSITY

Topics for Clinical Research Meetings—April and May, 1957

Date	Speaker	Topic
April 10	Drs. J. W. MacIntosh, W. I. Morse and R. C. Dickson.	Some Effects of Glucose and Succinate Loading In Obesity.
April 24	Dr. Antoni Trias	The Effect of Pressure on Growing Bone.
May 8	Drs. C. M. Harlow, J. A. Noble and J. A. Myrden.	Cholesterol Metabolism in Atherosclerosis.
May 22	Drs. C. B. Weld and W. I. Morse.	Determination of Human Density and Water Content.

Housing Application Form

The Medical Society Nova Scotia
 Digby Pines Hotel, Digby, N. S.
 August 29, 30 & 31, 1957.

MR. HOWARD WALKER,

Manager.

Digby Pines Hotel,
 Digby, N. S.

Please reserve for me the following:—

In Hotel

- () Double room with bath—twin beds—including meals \$12.00 per person per day—
 minimum rate \$24.00. (2 Persons)

In Cottage

- () Cottage with sitting room and two twin bedded bedrooms—including meals \$13.25
 per person per day—minimum rate \$53.00 per day. (4 Persons)
- () Cottage with sitting room and three twin-bedded rooms—including meals \$13.25
 per person per day—minimum rate \$79.50 per day. (6 Persons)

I WILL ARRIVE AUGUST..... A.M..... P.M.....

I EXPECT TO DEPART

Name of persons who will occupy above accommodations:

Name (Dr. & Mrs.)

Address.....

In view of the large attendance expected, no single rooms will be available at the Digby Pines Hotel, unless cancellations permit. If coming alone, please check here.....(v) if you are willing to share a room. If you have a preference for some party to share a double room with (or couple(s) to share a two or three bedroom cottage with) please insert name (s) below:—

I would prefer to share accommodation with

Name.....

Address.....

Name.....

Address.....

APPLICATION OF THE ANTISTREPTOLYSIN-O TITER IN THE EVALUATION OF JOINT PAIN AND IN THE DIAGNOSIS OF RHEUMATIC FEVER*

Data are presented on the frequency, early appearance and importance of joint pain as a manifestation of rheumatic fever in 648 consecutive patients below the age of seventeen years admitted to the House of the Good Samaritan between 1943 and 1948. The results indicate that, if cases of chorea are excluded, 50 per cent of the remaining patients had significant arthritis. In 92 per cent of the rheumatic-fever patients with arthritis, joint pain was the earliest symptom. Fifty per cent of the patients with arthritis had cardiac involvement.

Data are presented on the distribution of antistreptolysin-O titer in four different groups; 208 cases of authentic rheumatic fever with carditis, 227 cases of rheumatic fever with arthritis, 75 cases of rheumatoid arthritis and 92 cases of miscellaneous diseases with joint pain.

Distribution of the antistreptolysin-O titer in the 227 rheumatic-fever patients with arthritis was very similar to that of the 208 patients with rheumatic fever regarded as authentic because of the presence of cardiac involvement. Furthermore, the distributions of the antistreptolysin-O titer of the subgroups with and without carditis, in the rheumatic-fever patients with arthritis, were similar.

Eighty-five per cent of the patients with rheumatic fever, in contrast to 28 per cent of those with rheumatoid arthritis and 8 per cent in the miscellaneous group, had antistreptolysin-O titers of 400 units or more. On the other hand, 56 per cent of the patients with rheumatoid arthritis, 60 per cent with miscellaneous diseases and only 1.8 per cent with rheumatic fever had titers below 159 units.

A study of selected groups of patients of fairly comparable age and with illnesses of fairly comparable duration suggests that neither patient age nor duration of illness had a significant effect on the difference in distribution of the antistreptolysin-O titers observed among the patients with rheumatic fever, rheumatoid arthritis and miscellaneous diseases.

Although definite information regarding the relative frequency of rheumatic fever and rheumatoid arthritis in childhood is not available, the admission date from the Children's Hospital suggest that rheumatic fever is encountered much more frequently than rheumatoid arthritis in children above the age of four years.

It is concluded that joint pain is a frequent, early and important manifestation of rheumatic fever. It is also concluded that the antistreptolysin-O titer is a helpful laboratory test in the differentiation of joint pains of rheumatic fever from those of rheumatoid arthritis and miscellaneous diseases with joint pain. Joint pain with high antistreptolysin-O (400 units or more) is consistent with, though not diagnostic of, rheumatic fever. The present study indicates that in patients between the ages of four and sixteen years the combination of joint pain and high antistreptolysin-O titer is encountered much more frequently in rheumatic fever than in rheumatoid arthritis. Antistreptolysin-O titers of less than 159 units in patients with joint pain may be regarded as an important negative exclusion index for the presence of active rheumatic fever. This study also shows that the height of the antistreptolysin-O titer cannot be used in the prediction of heart damage.