

The R.C.A.M.C. IN THE KOREAN WAR

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SUBSEQUENT to the 1939-45 War, the Canadian Regular Army was reorganized on a structural basis which provided for a small, compact, highly efficient force which in turn would be capable of rapid and large expansion should the

occasion demand. Included in this Regular Army were elements which would provide for the administration and training of the Canadian Reserve Army, which in turn continued to be considered the central means for providing the very large army which Canada would require in case of a large-scale international conflict. In addition, in the Regular Army there was organized a mobile striking force of regulars designed to be the first line of defence in case of attack being mounted against Canada across the northland areas.

Within the structure of this small regular army the R.C.A.M.C. was reorganized in 1946-47. The Royal Canadian Army Medical Corps, like the Regular Army, was small, compact and highly efficient for its purpose. The purpose of

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the R.C.A.M.C. as well as the Regular Army, it will be remembered, was the provision of training and administration for the Reserve Army and the provision of a mobile striking force which would be Canada's first line of defence in case of attack on Canada itself. During the period 1946 to 1950 the R.C.A.M.C. grew within this structural framework. The various tasks assigned to the R.C.A.M.C. were accepted and fulfilled during this period.

During the summer of 1950 the North Korean communist aggression against the South Korean Republic resulted in a world-wide reaction. The United Nations organization found ways and means of negating the effectiveness of the vetoes wielded by the U.S.S.R., and the U.N. Security Council called upon the member nations to provide forces and arms for the support of the victim South Korean Republic. The U.S. Armed Forces were thrown into battle at once and the other member nations of the U.N. made preparations to assist in the war against the aggressors.

Canada, being a member nation in the United Nations organization, was faced with a decision in this regard. The government of Canada accepted the responsibility devolving upon Canada as a member nation of the United Nations organization and took steps toward the production of forces for the Korea "police action." It was decided that Canada would provide an Army Brigade Group as well as certain Royal Canadian Air Force and Royal Canadian Naval operational elements.

Since the small Canadian Regular Army was not designed to provide for overseas forces, it was necessary to organize a new formation, namely, the 25th Canadian Infantry Brigade Group, for the purpose of taking the field in Korea alongside the other forces of the United Nations. Special recruiting drives were held in August 1950. The new brigade group, 25th Canadian Infantry Brigade, was recruited and began training during the autumn of 1950.

An independent Army Brigade Group, in Canadian organization, ordinarily includes three Infantry Battalions, one Artillery Regiment, an Army Service Corps Supply and Vehicle Unit, an Ordnance Supply Unit, and elements of the Royal Canadian Signals, Royal Canadian Engineers, and Royal Canadian Armoured Corps. In addition, a Royal Canadian Army Medical Corps Unit, namely a Field Ambulance, is usually included in the establishment of such an independent Brigade Group. In the case of the newly formed Brigade Group the normal structure was maintained and a new Royal Canadian Army Medical Corps unit was recruited and organized for duty with this Brigade. This unit was the 25th Canadian Field Ambulance. It may be said at this point that in addition to the Field Ambulance there are included within a Brigade Group certain other medical elements which are part and parcel of the fighting units. The R.C.A.M.C. elements in the combatant units are the medical officer, who is an R.C.A.M.C.

officer attached to the Infantry or Artillery, and five non-commissioned officers of the Royal Canadian Army Medical Corps who are attached to each combatant unit.

During the autumn and winter of 1950-51, 25th Canadian Infantry Brigade Group and the R.C.A.M.C. units and elements which were part of that Brigade Group were trained and prepared for despatch to the Far East.

In the spring of 1951, two senior officers of the R.C.A.M.C. were despatched to the Far East to examine and make an appreciation of the situation as regards medical arrangements for the Canadian Infantry Brigade Group when that formation would be despatched to the theatre of operations. At about the same time it became apparent that the Canadian Infantry Brigade Group would probably not be operating as an independent Brigade Group but would more probably become part of a Commonwealth Division, which would in turn consist of three Brigade Groups provided by Commonwealth countries and, in addition, Divisional supporting troops for these fighting Brigades.

Originally it had been considered that the independent Canadian Brigade Group would be operating alongside United States Army formations and would make use of the supply, medical, transportation and other organizations which were part of the large American Army operating in the Korean theatre. In so far as the medical contribution by Canada was concerned this concept had been, up to that time, a legislating factor and it had not been considered necessary to provide medical units from Canada other than those which were the normal complement of an independent Brigade Group.

The formation of the Commonwealth Division presented the Commonwealth authorities with the problem of providing a Field Dressing Station to round out the divisional medical organization. A Field Dressing Station is capable of providing a firm base for the operations of surgical teams and transfusion teams, thus providing what is, in effect, a small hospital for the definitive care of wounded soldiers.

The investigating officers on examining the situation in Korea and Japan found that the U.S. Army had already made provision for field hospitals near the battle line, and along the lines of communication back to Pusan, which is a sea port lying at the southern extremity of the Korean peninsula. In addition, in Japan some 500 miles by air from the battle line, a combined British and Australian hospital was established

and operating at Kure. It was found also that the Royal Australian Air Force was prepared to provide transportation for casualties from air-dromes close to the battle line back to the Commonwealth hospital area in Japan.

In the immediate battle area the United States Army Medical Service had established Mobile Army Surgical Hospitals for the purpose of providing immediate surgical care for casualties of all types. In addition, the U.S. medical authorities were providing helicopters for the evacuation of casualties from the front line to the Mobile Army Surgical Hospitals.

From an examination of the situation, it was apparent that the U.S. Army medical authorities and the Commonwealth authorities were in a position to provide adequate medical attention for all Canadian casualties after those casualties had been evacuated from the battle lines. Normal plans for the Canadian Infantry Brigade Group were such as to provide the early care for the wounded, and evacuation from the battle lines, by R.C.A.M.C. personnel of the Canadian Field Ambulance.

Throughout the two Great Wars, in which Canada has played a large part, it has been the policy of the Canadian Army to provide Canadian medical attention for Canadian casualties at all levels where such attention is necessitated. This policy has been based on the fact that the Canadian soldier expects treatment by Canadian doctors and nurses whenever it is possible to provide such treatment. This policy does not cast a reflection upon the professional ability of doctors and nurses other than those of Canadian origin but rather is based on a sentimental and natural desire of the wounded man for contact with people from his own homeland.

Bearing all factors in mind, investigating officers proposed certain additions to the Canadian medical contribution to the Far East theatre. The organization, as proposed and put into effect, was as follows:

(a) The 25th Canadian Field Ambulance and the Regimental Medical establishments would provide the initial first-aid treatment and evacuation of casualties to hospitals in or near the battle area.

(b) 25th Canadian Field Dressing Station would be organized and despatched to the Far East to act as the Divisional hospital for the Commonwealth Division.

(c) A Field Surgical Team and a Field Transfusion Team were to be organized and despatched for duty with the 1st British Commonwealth Division.

(d) At Kure, Japan, the British Commonwealth General Hospital was to be supplemented by a Canadian

Section consisting of three medical officers, seven nursing sisters and 21 non-commissioned officers and men of the Royal Canadian Army Medical Corps.

Since all Canadian casualties were to be collected at Seoul, Korea, for despatch by air to the Commonwealth General Hospital at Kure, Japan, it will be apparent that, by providing the units enumerated herein, provision was being made for Canadian medical personnel to be available for the care of Canadian casualties at all levels from the time of wounding until the casualty had reached the base hospital in Japan. From the base hospital in Japan, if the casualties were to be evacuated to Canada as unfit for further service, such evacuation to Canada was to be carried out by the American Air Force Medical Service.

The Canadian Infantry Brigade Group sailed for Korea in April 1951. Accompanying it were 25th Canadian Field Ambulance plus the Canadian Field Surgical Team and the Canadian Transfusion Team. In the following July the 25th Canadian Field Dressing Station proceeded to Korea and was available for duty by August. Throughout the balance of 1951 and the year 1952 Canadian medical units and components applied themselves to their appointed task and, in spite of many difficulties and privations, provided a very high level of medical and surgical attention for the Canadian soldiers fighting in Korea. In addition to the thousands of Canadian casualties who passed through the Canadian medical units, there were additional thousands of Commonwealth and U.S. Army casualties who received care and attention at the hands of the R.C.A.M.C. personnel. It will be appreciated that in addition to the Canadian medical effort there was a concomitant effort by British, Australian and American medical units. Medical units of the United Nations all worked together to provide best possible medical and surgical care for all soldiers, no matter from which nation they might have come.

Early in 1953, as a result of further investigations by a senior Canadian medical officer, it was decided that some further Canadian contribution to the medical services of the Commonwealth fighting in Korea might be made. By this time the Canadian Field Dressing Station had become, in effect, a small field general hospital operating in the area of the Commonwealth Division. Considerable surgical attention was being given to casualties within 15 miles of the

battle line. Provision of this attention resulted in the early recovery of the wounded and sick and their consequent return to duty with their units without the delay which would be consequent upon the evacuation of such casualties a distance of 500 miles to Japan. In order to make this small hospital work at the highest level of efficiency, it was considered that nursing sisters should be provided for the postoperative care of casualties. As a result an additional detachment of Royal Canadian Army Medical Corps Nursing Sisters was despatched to Korea for duty at the Field Dressing Station.

In addition to the care of the sick and wounded soldiers of the Commonwealth and United Nations Forces, the Royal Canadian Army Medical Corps made a further contribution to the United Nations' effort by providing, to as great an extent as possible, medical care for the local Korean population. It is considered that this gesture will enhance markedly the reputation of Canada among the unfortunate South Korean people.

MEDICAL PROBLEMS AND CASUALTY MANAGEMENT

The interval between the Second World War and the Korean conflict was sufficiently short for the lessons learned in the fields of war medicine and surgery not to have been forgotten. Unfortunately, many of the medical personnel were without actual medical experience in a theatre of operations. But under guidance these personnel applied the old accepted principles and helped to develop new practices and procedures. The problems encountered in Korea were those of modern war fought with conventional weapons, a largely mountainous terrain almost devoid of roads, a climate varying from heavy rain followed by heat and dust in summer to the extreme cold of winter, and the prevalence of diseases endemic in the country. How well these problems were met is reflected in the low mortality rate from disease and wounding (Table I).

Among the diseases encountered in Korea was the little-known hæmorrhagic fever, described to some extent by the Japanese in 1939. This condition is an acute febrile illness with increased capillary permeability, hæmorrhagic tendencies, hypotension and renal damage. Cases varied in severity from mild to those requiring treatment for shock. Usually there were

TABLE I.

<i>Campaign</i>	<i>Mortality rate of wounded per 1000 wounded</i>	<i>Mortality rate from disease per 1000 soldiers per annum</i>
Boer War (British).....	93	22.0
World War I (Canadian)....	114	6.0
World War II (Canadian)....	66	0.9
Korea (Canadian).....	34	0.7

a febrile phase, a hypotensive and oliguric phase, and a diuretic phase. The cause of the disease has been difficult to determine but is now generally considered to be a virus, with the vector a chigger mite associated with rodents. Preventive measures have been directed to the eradication of rodents and the impregnation of clothing with miticidal and repellent materials. The treatment is non-specific, consisting chiefly of carefully controlled physiological support. As cases travelled poorly by road, helicopter evacuation was used when feasible and was believed to reduce hæmorrhage and shock. It was found best to centralize such cases for the benefit of experience in evaluation and therapy. The mortality rate among United Nations troops was 5 to 7%.

Malaria is prevalent in Korea but the incidence of primary attacks among our troops in the Far East was not high and lessened with experience. Paludrine was used as the suppressive drug by the Canadian Forces. However, following the rotation of the Canadian Brigade in 1952, over 1,000 cases of malaria were reported during the next several months in Canada. It was decided to treat these "break-through" cases with primaquine plus quinine or chloroquin. With this therapy there were few recurrences. It was also decided that as troops left the Far East theatre they would be given a 14-day course of primaquine in an attempt to destroy the tissue forms of the parasite. The Brigade returning to Canada in 1953 had only one-fifth of its predecessor's malaria incidence.

Venereal disease has a high incidence in the Far East and one must admit that our Canadian rates were high also. However, the number of man days lost due to V.D. was relatively small, as our policy has been to treat these cases on an ambulatory basis. Very few require hospitalization. Syphilis has been fortunately rare, chancroid more common, but mostly the infections have been gonococcal or non-specific urethritis.

Jaundice due to infectious hepatitis occurred but never reached serious proportions. Homologous serum jaundice cases were encountered and apparently were due to infected plasma infusions.

During the period of active hostilities in Korea the Divisional Psychiatrist for the 1st Commonwealth Division was supplied by the R.C.A.M.C. This officer was stationed at the Field Dressing Station where he maintained a small ward for observation cases and short-term treatment. The general policy of treatment as close to the front as possible was being maintained in order to minimize the factor of gain through illness. The psychiatrist visited regularly the Field Ambulance where the patients were sent. Those with slight or no disability were returned directly to duty. Cases of more severe disability were kept at the Field Dressing Station for short-term psychotherapy and sedation, the majority either being returned to their units or employed in rear areas in Korea. The cases medically evacuated from Korea consisted of psychosis and severe psychoneurosis such as intractable conversion reactions. Psychoneurosis occurred at the rate of two per thousand per annum; this is the rate to be expected in any comparable group of people. Battle exhaustion did not occur to any great extent, due, it is felt, to the nature of the fighting in which battles were of short duration and the fatigue factor was not operative. Psychiatric consultation was frequently requested in the case of soldiers accused of breaches of discipline. These cases were examined and, if no medical disability was present, were returned to their units for administrative disposal.

As there was only one Canadian Field Surgical Team in Korea, and in the early days it was based on an American Mobile Army Surgical Hospital (MASH), part of the initial or forward surgery was performed by American and to some extent by Norwegian surgeons. As soon as it was possible, these casualties were returned to Canadian channels. Further hospitalization and surgery, as required, was carried out at the British Commonwealth Hospital in Kure, Japan, where there was a Canadian section.

The lowering of mortality rates in Korea was due to a number of factors: helicopter evacuation, armoured vests, more abundant and varied antibiotics and improvement in resuscitation and

the treatment of impending or established renal shut-down.

Resuscitation measures were noteworthy for the large amounts of whole blood frequently employed and for the introduction of plasma volume expanders. Plastic disposable intravenous equipment was used in Korea and reactions which might be attributed to the set were noticeably absent. This was not the case in the British Commonwealth Hospital in Japan where recoverable rubber sets were employed. It was appreciated that wound shock is due chiefly to a deficiency of circulating blood in the arterial system, and efforts were made to correct this deficiency quickly and adequately. Intra-arterial blood transfusion was frequently used in cases of profound shock, and in selected cases was considered to be more beneficial than multiple transfusions by the intravenous route. Recent investigations indicate, however, that the rate of transfusion and not the route is the important factor. Group "O" low titre blood, if possible no more than 14 days old, was used in the forward areas and was ordinarily in abundant supply. Very large amounts of blood were administered in certain serious casualties, sometimes with success but, as might be expected, mortality rates were higher when large quantities were required. The following U.S. figures for the blood requirements for 1,000 Korean casualties during the first 24 hours are interesting:

TABLE II.

<i>Blood used</i>	<i>No. of casualties</i>	<i>% of casualties</i>	<i>Mortality</i>
0 - 4 pints.....	862	86%	1%
5 - 14 pints.....	111	11%	8%
15 or more.....	27	3%	41%

The Korean conflict was essentially a small-scale war for which abundant services and supplies could be provided. This desirable situation would present a serious problem in a large-scale war.

The plasma volume expander, dextran, was used considerably in resuscitation in the forward areas with generally satisfactory results. It was, of course, no substitute for blood but was useful for increasing the circulating blood mass. Dextran was used where plasma was normally administered or where blood was not available. It eventually supplanted plasma when it was discovered by U.S. Medical Corps follow-up that more than 20% of their patients who had re-

ceived pooled plasma went on to develop homologous serum jaundice.

The value of good anaesthesia and the need for skilled anaesthetists was again demonstrated in Korea. Canadian equipment was good and our anaesthetists were able to play their full part in the repair teams. Cyclopropane was made available and was frequently the anaesthetic of choice among Canadians. The anaesthetists did much to spread the gospel of intravenous administration of morphine in the forward areas. The danger of the cumulative effect of repeated subcutaneous or intramuscular doses of morphine in the shocked patient was stressed. The old Army custom of providing the casualty with innumerable cups of hot, sweet tea or other beverages as he passed down the evacuation line to surgery was also decried by the anaesthetists.

Surgical practices in the management of wounds were much as they were in 1945. The same adequate débridements and the "no suture" techniques were employed. Plentiful antibiotics might improve results but were no substitute for thorough, early, initial surgery. It is not within the scope of this paper to attempt detailed descriptions of the treatment of individual types of injury. A few comments are offered only where there may have been a change in policy.

In certain instances abdominal cases were evacuated by air to Japan on the 6th or 7th post-operative day perhaps because of local bed requirements. Air evacuation usually results in some abdominal distension, an ambulance ride is associated and considerable handling of the patient is required. Most patients arrived distressed and there were some wound disruptions. This served to emphasize that the normal policy of holding abdominal cases for 10 days after operation is sound.

Chest wounds were handled ordinarily by the conservative measures of closure and aspiration unless formal thoracotomy was indicated for continued profuse hæmorrhage or injury to other intrathoracic organs. However, in cases going on to empyema the value of early decortication in 3 to 5 weeks was recognized and practised. Many lung fixations were thus corrected and many patients restored to duty.

Burns, chiefly due to accidents, were fairly common, particularly in the winter months. Fluid (including blood) requirements were restored, burn toilets were carried out and occlusive dressings applied. The large N.R.C. special burn

dressings were employed to some extent as first-aid measures and also after local treatment. The value of the open or exposure method of burn treatment was appreciated, but it was not found to be practical when patients had to be evacuated after débridement. Minor burns on patients held in forward areas could be left open and many burns originally dressed in Korea were exposed some three to five days later in Japan with good results.

The Tobruk splint, so familiar to Canadian medical officers, especially in the Spaghetti League, was replaced by the hip spica in the treatment of fractures of the femur. Likewise, amputations tended to be of the circular type with applied traction. This was American policy.

The problem of the early repair of important arterial lesions in battle casualties was studied, and methods were demonstrated by American specialists in this field. With improved techniques and patient management, many successful repairs were carried out where ligation only would have been done in World War II. The need for early recognition of the lesion, splinting of the limb, control of hæmorrhage by dressings rather than by tourniquet and early evacuation to the surgical centre was emphasized. All forward surgeons should be familiar with arterial repair, although time might not allow for more than ligation if casualties were extremely heavy. The Korean studies in vascular surgery have been well worth while.

American shock research teams went to Korea in 1952 to study the problems associated with resuscitation and renal shut-down. Intensive investigations and therapeutic measures included dialysis with an artificial kidney. Much knowledge of the problem was gained and the artificial kidney saved some lives. A number of our Canadian officers had the opportunity of visiting this centre and a few were attached for a valuable period. We are grateful that the larger American medical services in Korea were able to undertake this important research and shared their valuable experience and knowledge. While artificial kidney units, as such, may not be altogether practical in another major war, the knowledge gained will make for a better management of the severely shocked casualty.

The Korean war demonstrated the value of the helicopter as an adjunct to the hand carriage and ambulance transport of casualties. It was particularly useful in the forward pick-up and

evacuation of serious cases because of the difficult terrain and lack of roads. Serious cases were transported quickly and smoothly to forward surgical units or to special centres for neurosurgery, hæmorrhagic fever, or renal shut-down. Careful triage of casualties was required in order not to abuse the restricted helicopter service. An available helicopter service is a most desirable bonus to other means of transport of casualties. Unfortunately, there are many re-

strictions on their use. In addition, the cost is high, maintenance times are long and the load capacity is small.

The Korean conflict may have been a localized war but it was a dirty, difficult one. It served as a training and testing ground and, as in the case of all wars, medical knowledge was advanced. We feel proud of the part played by the Royal Canadian Army Medical Corps.
