on duty in the emergency room

Albumin/Cutter

for rapid shock therapy

Albumin should be available for emergency treatment following trauma, hemorrhage or burns because it immediately restores and maintains an effective blood volume. An intravenous infusion of 50 cc. of 25% albumin may be expected to pull 175 cc. of fluid into the circulatory system within 15 minutes. It would require 250 cc. of plasma or 500 cc. of whole blood to duplicate this therapeutic effect. In addition, Albumin/Cutter is salt-poor, heat-treated against the hepatitis virus, and ready for immediate use. Also indicated in: acute barbiturate poisoning, cirrhosis, cerebral edema, nephrotic syndrome, hypoproteinemia. Available in: 50 cc. emergency kits, complete with administration equipment; 20 cc. vials.

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FOR MORE THAN half a century, Alexander Primrose occupied a unique position in the world of surgery. He came to Toronto from Nova Scotia, a young man in his late twenties. He achieved eminence as a pathologist, an anatomist, a surgeon, a teacher, a soldier and as a leader in organized medicine. He died beloved and mourned by generations of doctors who had come under his influence as students and by hundreds of patients and soldiers and honoured by his peers and colleagues.

He was born in Pictou, Nova Scotia, in 1861. When a youth, the plan that he should enter the tea planting business in India where there were family interests was changed by an accident. He used to say with relish: "I was kicked into surgery." An accident with a horse resulted in a broken leg, and in the long convalescence which followed he was taken to John Stewart of Halifax for advice. Stewart must then have been at the beginning of his great career as the leading surgeon of the Maritimes. He was Lister's clerk when Lister moved from Edinburgh to London in 1877. He was chosen by Lister to assist him in London. He walked all the way from Edinburgh to London, not because it was economically necessary, but because he was fond of walking. He returned to his native Halifax to initiate antiseptic surgery in Canada and he lived to see the development of modern aseptic surgery and finally the return to modified antiseptic surgery in the management of wounds in the 1914-1918 war.

Alexander Primrose's contact with John Stewart opened his eyes to a vision—the world of surgery—which must have been fascinating indeed to any young man in the days when the whole world of medicine was being revolutionized by antisepsis and the new approach to a host of diseases due to infection. The result was that he decided to become a doctor. India lost a good tea planter, the Empire a nabob, but Canada and the world gained a great surgeon and a wise administrator of medical affairs.

Like John Stewart and most young men from Nova Scotia, he went to Edinburgh for his medical education. He graduated from there M.B., C.M., in 1886 and then went to London to study at the Middlesex Hospital and the Great Ormond Street Hospital for Children. He came to Toronto in 1888 and there began his great career in surgery.

It is said, and I believe it is correct, that at some stage during his medical education, he failed in an anatomy examination. In view of his subsequent achievements as an anatomist this is ironical but in later years it enabled him to console those of his students who had similar misfortune and to encourage them to retrieve themselves by greater effort.
In his early days of practice, he distinguished himself by preparing and cutting the pathological sections from his own cases. Probably it was this interest in pathology which led to his appointment as President of the Pathological Society in 1998. From 1896 till 1907 he was Professor of Anatomy at the University of Toronto School of Medicine. It was in this capacity that he made one of his greatest contributions to medical teaching. He was an excellent anatomist, well trained in the Edinburgh school. He developed teaching methods which are still remembered, especially his summary of anatomy at the end of the term when the essentials of anatomy were reviewed in twelve lectures illustrated by blackboard diagrams in coloured chalks, drawn with both hands simultaneously while he lectured on the problem he was illustrating. The combination of lucid description, ambidextrous illustration in colour and synopsis of essentials made such an impression upon his students that years later in his retirement he was invited from time to time to take them back to their student days by repeating his fascinating survey of anatomy.

With all these and many other activities he was a practising surgeon. From 1918 to 1930 he was Professor of Clinical Surgery. He read widely and was a keen observer. He was a good teacher, not only because of the orderly presentation of facts, but also from the diversity of his interests, the breadth of his knowledge and his enthusiasm for every aspect of surgery. He managed to transfer some of his enthusiasm to his students. I can well remember his inspiring me to sit up all night to obtain samples of blood at hourly intervals from a patient with elephantiasis and to examine these under the microscope for Filaria sanguinis hominis which he said swarmed in the peripheral blood vessels only at night (but that night they did not swarm). There was warmth and humanity in his relations with students and his colleagues which won their admiration and friendship.

He went to Salonika in the First World War with the University of Toronto General Hospital (No. 4) as officer in charge of surgery. In 1916 his only son was killed in France. He was granted compassionate leave to return home because of this. He returned to England in 1917 as Consulting Surgeon of the Canadian Forces. He was made a Companion of the Order of the Bath (military division) in 1918 for his services in the war.

He had a strong sense of responsibility for the problems and duties of organized medicine and placed all his energy and ability at the disposal of the medical and surgical associations with which he was in contact. In 1921, when the Canadian Medical Association was so enfeebled and so deeply in debt that it was proposed that it give up its charter and abandon its existence, he played an important part in the re-organization of its constitution and the transfusion of new life and energy into the nearly defunct body. He was the first Chairman of the General Council of the Canadian Medical Association under the revised Constitution and he held this position for six years, 1924-30. He was President of the Canadian Medical Association in 1932. He was a good administrator and a strong committee man, quick to grasp the essentials of a problem, tactful of the opinions and feelings of committee members, hard-working and successful in keeping the problem in focus until a decision was reached. His equanimity and unfailing good humour tided his committee meetings through many a crisis. These qualities, in addition to his great interest in the scientific side of surgery, made him an asset in medical and surgical bodies. He was President of the American Surgical Association in 1931, the second Canadian to hold this office; President of the Academy of Medicine in Toronto in 1918 as well as previously holding the presidency of two of the bodies which united to form the Academy of Medicine—the Pathological Society of Toronto in 1898 and the Toronto Medical Society in 1900.

The greatest tribute to his administrative ability was his appointment as Dean of the Faculty of Medicine of the University of Toronto in 1920. He occupied this post for twelve years.

In his early youth he acquired the habit of keeping a record of his day’s work and he continued this throughout his life. These were not diaries but rather notes concerning his work and his responsibilities. Moreover, he kept these memoranda. His family has a great mass of this material all written in his neat, minute hand, sometimes the notes of a journey, sometimes accounts of money spent or records of letters written, or some item he thought interesting or important. An amusing example of the latter is the correspondence between the headmistress of a girl’s school in Toronto and Dr. Primrose in 1909. A certain medical student had disgraced the proprieties by waylaying the queue of schoolgirls returning from church on a Sunday evening to thrust into the hand of one of them a note to be delivered to another girl attending the school. The shocked headmistress wrote to Dr. Primrose, who was at that time the school doctor as well as a member of the Faculty of Medicine, asking him to demand of the medical student an explanation and apology. This he did but the apology the student wrote was facetious, insincere and anything but humble. It drew from Dr. Primrose a stinging note of reprimand. It was agreed that he was a disgrace to the medical school and would come to no good and that he had seriously compromised the reputations of the two girls. For some reason Dr. Primrose kept this correspondence. Written in the handwriting of Dr. Primrose across the foot of the copy of his letter to the student is an excerpt from Who’s Who dated 1940, concerning the culprit. He had won a D.S.O. in the first war and was mentioned in dispatches; had done postgraduate work in London, Edinburgh and Vienna, and married a girl from Brussels (who had not attended school in Toronto) and was successfully practising in England. I can imagine the chuckles that Primmy enjoyed as he recorded the success of the renegade who so many years before had seemed headed for perdition.

His habit of note keeping is seen at its best in the bound volumes entitled, “Cases in Practice” which contain the records of his patients (Fig. 2). These were started when he commenced practice in Toronto in 1888 and continued until he ceased to see patients in 1943. In a series of small books he made notes each day on every new patient and every operation he performed. These were bound together
every two years and indexed and cross-indexed so that it is easy to find the record of any patient. The complete set is now in the Academy of Medicine, Toronto. The last entry in his case books is dated June 15, 1943, and is a record of the good condition on that date of a 54 year old man whom he had operated upon at the age of 13 for a brain abscess with Jacksonian fits, the result of a punctured fracture of the skull. In Toronto he must surely have been the first surgeon to pay attention to careful clinical records. His justifiable pride in this is reflected in the title of his presidential address to the American Surgical Association, “A Study in Records”. It was an account of interesting surgical problems gathered from his surgical case books.

His interest in surgery was catholic. In every field he found something which concerned him. He had a mind receptive to new ideas and new measures for the cure of disease. He frequently was the first in Toronto to see the merit of a new operation or procedure and the first to introduce it into our practice. I can recall seeing him perform an Albee spinal bone graft for Pott’s disease which must have been the first such operation performed in the Toronto General Hospital. He had no electric saw. The graft was removed from the tibia with a hammer and chisel cutting from drill hole to drill hole. I believe he was the first in Toronto to conduct a blood transfusion. He used the difficult and uncertain technique of Creile which was all that was available at that time. But his greatest achievement as a surgeon derived not so much from his technical skill as from his wide knowledge of surgical disease and the literature concerning it and from his sound judgment based upon his accurate knowledge of the results of his own surgical efforts derived from his records. Seventy-five surgical papers and addresses are included in his bibliography, the last of which was the Balfour Lecture on the “Interrelationship of Anatomy and Surgery and its Historical Background”.

Some inkling of his feeling for his work is gained from this excerpt from a letter he wrote to his daughter Olive in 1922 when she was a nurse in training at the Royal Victoria Hospital in Montreal. “It seems so extremely interesting to me that you are beginning to work ‘on the wards’. That is where your Daddy has spent a lifetime and anything I have ever done worthwhile has been done ‘in the wards’. I loved it and am only sorry now that I have to retire from the public wards of the General Hospital because of the age limit. It is a great satisfaction to me that my girl is taking the job on in her Daddy’s place and helping to do some service for the poor sick folk.”

Many honours came to him. The Royal College of Surgeons of England elected him a Fellow in 1925. His alma mater, the University of Edinburgh, awarded him an LL.D. in 1926. Of this he was very proud. He became an LL.D. of Dalhousie in 1930. He reached the rank of Colonel in the Army and was awarded a C.B. Many surgical organizations recognized his great qualities by electing him their president and he often delivered endowed lectures in surgery at various universities.

In 1957, immediately before settling in Toronto, Dr. Primrose married a friend of his boyhood, Clare Christina Ewart. His Edinburgh note books record that he was writing to her regularly while he was studying medicine there. They had five children: Dorothy, who married Graham Joy; Agnes, who married the Honourable Justice Norman Macdonnell; Howard Primrose who was killed in action in France in 1916; John Ewart who died in infancy and Olive Clare, now Mrs. John Coulter and the only surviving child. Mrs. Primrose died in 1919, heartbroken over the death of her son Howard. In 1921, Dr. Primrose married Elizabeth Britton, the widow of Mr. Charles Moss. He was blessed in both marriages. His home on College Street where his children grew up was the centre of a warm family life and its close proximity to the Hospital for Sick Children and the Toronto General Hospital made it almost an annex to these institutions where young doctors learned they might obtain advice and encouragement for the seeking. His later home on Forest Hill Road is remembered for its hospitality to old and young. For many years Sunday luncheon was the occasion for entertaining university students, and is still happily remembered by them. This was only one of its many friendly activities. In the summer, Dalwham, his home in Muskoka, was open house to his friends, and many are the happy holidays they spent there with him and his family.

Dr. Primrose had a great zest for life and a great love of people. His profession, his patients, his students, his colleagues, the university, the medical and surgical associations to which he belonged, his church, his summer home at Muskoka, the Medical Arts Building all were sources of satisfaction and happiness to him. I never saw him dull or downcast. Reading his case records reveals the enthusiasm and interest which he had for his work and the satisfaction he derived from a difficult problem satisfactorily diagnosed, a new operation, a successful surgical result or an important person for a patient. There was a warmth and friendliness in his relations with students and young colleagues. To the end of his days he had as many young friends about him as he had friends of his own age. There was no bitterness in his nature and he harboured no ill will. He was a man of great character who for a long time wielded a powerful influence for good upon the surgical and social life of Toronto and Canada.

Mr. John Coulter, the playwright and author, has expressed in moving verse his feeling for the great man whom he came to know through marriage to his daughter. His appreciation of Dr. Primrose will stir the memories of students and colleagues for he records with singular fidelity and clarity those qualities of Dr. Primrose which made him a great surgeon, an inspiring teacher, a warm friend and a character of great strength. I cannot better close this tribute to Dr. Primrose than to quote from “Elegy for Alexander Primrose” which John Coulter wrote to his memory.

“"He was a great anatomist,” whispered a great anatomist
As we turned from the graveside. "A great teacher and pathologist,
And I listened to praise of a pioneer in surgical technique:
I could but speak of the sense in which to me
he was unique.

And spoke of him as a man who being in himself so serene
Generous and fulfilled, could bestow on the troubled or mean
As it seemed by his mere touch, his presence,
Some share
Of his own humane dignity, his genial philosophic air.

He was debonair, noble by blood link and
By intellectual stature
But most by the fine tempered mettle of his moral nature,
Yet a creature gentle, warm and quick with compassion,
Uncensorious, caring chiefly that, each in his fashion,

[...]

Fig. 3—A page from one of the case books. This is the beginning of the account of the illness of the famous Shakespearean actress, Ellen Terry, when she arrived in Toronto from Chicago, March 4, 1900.
UNIVERSITY TRIBUTE TO PRIMROSE

The Council of the Faculty of Medicine of the University of Toronto on February 5, 1932, paid tribute to Professor Primrose on his retirement. After a biographical survey, they said:

"It was as a teacher perhaps that Professor Primrose will be best remembered by hundreds of students in all parts of the world as an outstanding personality in this University. It is no exaggeration to say that for a period of nearly twenty years as a teacher of anatomy he had no superior in any medical school and very few could be regarded as his equal. To his teaching, both in anatomy and surgery, can be attributed in no small measure the general agreement as to the sound training afforded medical undergraduates of the University of Toronto. As an administrative officer of the Faculty of Medicine, first as Secretary and then as Dean, he rendered notable service and was unsparing of time and energy in his efforts to promote the welfare and best interests of the Faculty of Medicine. The great traditions of the Edinburgh School of Medicine, which he brought to this University have left and impress for good that is quite inestimable. His energy and enthusiasm have continued unabated through the years, and during the period of his Deanship there has been a remarkable expansion and growth in the Faculty of Medicine, both in the quality of the work done on the side of scientific research and investigation and in medical teaching.

"In no small measure the splendid influence which he has exercised on colleagues and students alike has been the result of his sterling character, those qualities of heart and mind which have endeared him to all. While he is at this time withdrawing from active participation in work within the University, he carries on, in many important capacities, in the organized medical profession of this country and elsewhere. To the service of these and other important interests may he long be spared. In the years to come may he every happiness. This is the sincere wish of all his colleagues and associates."

PRIMROSE ON "STANDARDIZATION"

"I would like to urge the undesirability of uniformity of the curriculum in our universities. It has been suggested, for example, that licensing bodies should issue schedules of study in each of these sciences, e.g., physiology, anatomy, etc. Not only so, but to stipulate the method of instruction, e.g., so many didactic lectures and so many hours of laboratory work. There is a craze for standardizing everything, including industries and education. The inevitable result will be to kill initiative and destroy individuality. If we take the subject of physiology, for example, it is surely conceivable that of two effective and efficient teachers, one may cover ground and utilize methods of instruction of an entirely different character from the other. Both have the same ultimate goal, namely, to teach the student the principles of physiology in such a fashion that he may later be able to approach a clinical problem fully equipped to use physiological methods in his bedside work. This end may be gained with equal success by very different methods of approach in the teaching of the particular science. The teacher should be free to use his own peculiar faculties for the attainment of the ideal result. Here again, in my opinion, the standardized water-tight compartment of a fixed schedule is to be condemned outright."


DEFINITION AND INTRODUCTION

A wringer injury is the result of catching an upper extremity between the rollers of a washing machine. It should be thought of as but one member of that broad group of mutilating arm and hand injuries referred to as crush injuries. The wringer injury is but one of the many preventable household accidents occurring during the accident-prone period involving children in the toddler and pre-school group. The injury is the result of a mother’s unguarded moment or unawareness of the potential hazard of the machine together with the child’s natural urge to explore.

The purpose of this report is to outline the Hospital for Sick Children method of evaluation and treatment of these injuries. The report covers the period from 1953 to 1956 (Table 1). The nature of this injury appears to be misunderstood and consequently the treatment is sometimes of an indifferent nature. Delay in adequate treatment can be detrimental to the crushed extremity.

TABLE I.—WRINGER INJURIES TREATED AT THE HOSPITAL FOR SICK CHILDREN, TORONTO

<table>
<thead>
<tr>
<th>Year</th>
<th>1953</th>
<th>1954</th>
<th>1955</th>
<th>1956</th>
</tr>
</thead>
<tbody>
<tr>
<td>Out-patients</td>
<td>89</td>
<td>105</td>
<td>83</td>
<td>72</td>
</tr>
<tr>
<td>In-patients</td>
<td>10</td>
<td>19</td>
<td>25</td>
<td>16</td>
</tr>
</tbody>
</table>

ETIOLOGY AND PATHOLOGY

The actual wringer mechanism is fairly constant but the tightness of the wringer, the duration of the exposure, and the amount of voluntary countertraction applied to the limb vary the degree of damage. The sites at which the rollers are most likely to stop their forward progress are: the dorsum of the hand, the wrist, the elbow region and, finally, the axilla. These areas, unfortunately, could not be more vulnerable with respect to the destruction of vital structures. There are three primary forces, each causing its own particular type of damage: contusion, friction, and avulsing forces. There is one secondary or delayed force, that of an expanding hematoma.

The contusing or crushing force may affect all layers. The blood vessels of the skin are ruptured or thrombosed producing varying degrees of ecchymosis. The subdermal fatty tissue is crumpled and the fat cells are ruptured. The large amount of free fat one sees in the hematoma is perhaps an explanation of the intense acute reaction with slow resolution that is characteristic of deep crush injuries. The muscle masses, usually those in the flexor compartment of the forearm, may be confused and a picture not unlike that of Volkman’s ischemic contracture may develop. Nerve, sympathetic, or contusion of a nerve, may occur.

The milder friction force produces a superficial abrasion. This force when more severe produces a discrete burn. The friction damage always combines with the other forces to impair the viability of the tissues.

Most wringer injuries have considerable separation of the skin from the underlying fascia, caused by the avulsing or shearing force. This produces a large space for the collection of blood and tissue fluid. The extent of this separation is never recognized until one has the opportunity of passing an instrument under the flap. In its more severe form, this force may tear the separated tissue and produce an avulsed skin-fat flap. If the arterial inflow to this type of flap is better than the venous drainage, black gangrene of the flap develops. Other avulsion damage consists of dislocations and fractures, particularly of the thumb, and neurotmesis or nerve interruption.

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WRINGER INJURY

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April 1958

ORIGINAL ARTICLES

WRINGER INJURY

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