MEDICAL COLLEGE OF VIRGINIA
RICHMOND 19, VIRGINIA

EVERETT IDRIS EVANS, M. D.
PROFESSOR OF SURGERY
AND DIRECTOR, LABORATORY FOR
SURGICAL RESEARCH

July 18, 1950

ARM1.950118.001c

Colonel William S. Stone
Medical Research and Development Board
Department of the Army
Office of the Surgeon General
Main Navy Building, Room 2749
Washington 25, D. C.

Dear Colonel Stone:

Thank you for your letter of July 11, 1950. In this letter I am sending you the information requested in Paragraphs five and six of the application blank and I have given you detailed information on the funds required for personnel, equipment, and supplies. If you wish further information on these points I will be glad to furnish it.

I am unable to state at this time exactly the unexpended balance of our funds as of July 1, 1950. It appears from a study that I have made that your statement of $80,000.00 being unexpended as of April, 1950 is essentially correct. The difficulty arises that at that time there was a considerable back-log of vouchers but for which the College had not been reimbursed. So far as I can guess without adequate information from our Business Office (because the auditor has not completed a study of all the vouchers on hand for which reimbursement is asked) I would estimate that we have on hand funds which will continue to support this study for at least three more months, that is, up to October 1, 1950. It may well be one more month could safely be added to that estimate but I cannot tell until I have more information from General Tompkins' office. I will let you know more exactly about this as soon as his office gives me more definite information.

I hope I have given you the information that your office and the Secretary of Defense of the Army needs when approval is requested for further funds for this study.

Yours sincerely,

Everett Idris Evans

Everett Idris Evans, M. D.

EIE:jbg
Enclosure

CC: General W. F. Tompkins

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5. Requirements for study:

a. Facilities:

(1) Available: Three-story laboratory research building completely devoted to thermal and radiation injury research; one five bed Metabolic Ward for study of negro burn patients; three hospital laboratories for chemical and hematological investigations on burn patients; complete use of all thermal injury patients and as many other trauma as we would desire. (In past year 124 severely burned patients hospitalized and 574 treated as out patients)

(2) Needed: Larger animal quarters to take care of urgently needed space to house at least 40 more dogs for thermal and radiation injury experiments. Construction of this about to take place with rental to the Department of Defense at arranged rental cost.

b. Personnel required:

Responsible investigator: Dr. Everett Idris Evans; $8000.00. I practically give full-time to this project and give additional time to the Medical Research and Development Board as requested.

Professional assistants:

a. Dr. William T. Ham, Jr.; $9000.00. Has charge of biophysics part of program. In charge of all physical problems concerned with thermal and radiation injury.

b. Dr. Lynn Abbott; $2400.00. Consultant to program; in charge of chemistries involved in preparation of tagged hemoglobin red cells for Mass Spectrometer in study on causes of anemia in severe burns.

c. Dr. G. Watson James; $3000.00. Consultant on hematological aspects of burn anemia program; half-time; directs technicians who prepare porphyrin samples for Mass Spectrometer analyses.

d. Mr. Ray Williams; $4500.00. Physics technician in charge of Mass Spectrometer who carries out all analyses of tagged hemoglobin.

e. Dr. W. J. H. Butterfield; $4500.00. Thermal injury expert, Medical Research Council, Great Britain, who will conduct studies on productions of flash burn by arc lamp aparatus and its physiological effects in experimental animals.

f. Dr. James Brooks; $4500.00. Has charge of actually carrying out experiments on burned animals;studying physiological effects of standard high and low temperature burns in a effort to answer problem of fluid and electrolyte balance in severe burns.

g. Mrs. Ann Williams, (M.S. - Chemistry); $3000.00. Will study oxysteroid excretion in burn patients in an attempt to correlate salt requirements with adrenal response in the patient.

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h. Two Residents (Edward M. Rice, M. D.) $3500.00
(Paul Robinette, M. D.) $3500.00
These two residents have actual charge of care of burn patients under principal investigators direction. Impossible to carry out proper balance observations unless we direct complete care.

i. Two Dieticians (Miss Elizabeth Lounds; $3000.00)
(Miss Mattie Robinson; $2400.00)
These two dieticians have charge of preparation of all diets for burn wards for Army Nutrition Laboratory research on diet in severe burns.

j. Technicians:

1. Miss Louise Belfield; $2700.00. Graduate nurse who assists the residents in the operating room on all surgical procedures for all burn patients.

2. Evelyn Hayes; $2160. Technician who does all radioactive phosphorus work on red cell loss in burn patients.

3. Carolyn Martin; $2400.00. Chemical technician who does all work on sodium and potassium and other blood studies in burn patients.

4. Vivian Wilkerson; $2400.00)
Anne Anderson; $2400.00) Technicians who prepare blood samples for Mass Spectrometer analyses in connection with study on the causes of burn anemia.

5. Three nurses; $9000.00. These nurses care for burn patients on Metabolic Wards in the hospital set aside for specific balance studies, in burn patients.

6. Franklin Foote; $1440.00. Janitor and handyman. Takes care of laboratory building.

7. Robert Brown; $1700.00. Animal caretaker who aids Dr. Brooks and Dr. Butterfield in research on experimental burned dogs.

8. Mathew Henley; $1440.00. Ward helper in burned Metabolic Ward.

9. Kenneth Smith; $2100.00. Radiology technician who has charge of keeping in operation all radiation aparatus.

10. Dishwashers; $1500.00. Cleaning of glass ware.

c. Materials needed:

Our present running expenses for all the burn research in the way of expenses for supplies and equipment is about $1500.00 a month so a fund of about $18,000.00 a year is required to pay for all supplies needed for the current year. It is contemplated that no serious outlay of equipment will be needed.

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6. Funds requested:

a.	Responsible investigator	$ 8000.00
b.	Professional assistants	43300.00
c.	Technician services	34840.00
d.	Equipment	4000.00
e.	Supplies	8150.00
f.	Travel	3300.00
g.	Communication	475.00
h.	Contingency	2000.00
i.	Overhead	10406.50
	TOTAL	$114871.50

SUMMARY OF WORK COMPLETED TO DATE:

It will be recalled that practically the first eighteen months of the present contract was spent in learning the nature of the problem of thermal and radiation affect of an atomic bomb through travel and many converences with leading scientists of the world; during this time considerable effort was made to secure competent personnel, build laboratories and secure needed equipment. During this time a highly efficient laboratory was developed from almost no resources at the beginning. In the second eighteen months the following objectives have been reached.

(1) Installation and operation of a one million volt Beryllium tube X-ray which allows a radiation of experimental animals. Dr. Ham and his group have worked with new methods of accurate calibration of this apparatus so we are one of the few groups in the country who accurately knows how much radiation is imparted to experimental animals. **(Manuscript in Press)**

(2) Production of standard burns in the experimental dog so that for the first time we can study thermal injury under standard conditions. Study of 60 dogs makes it possible now to estimate the plasma requirements per kilogram, per percentage body surface burn. (Manuscript in Press)

(3) Accurate estimation of red cell loss in standard burned animals with 50 and 30% body surface involved. This allows us to estimate correctly whole blood requirements in seriously burned patients. **(Manuscript in Press).**

(4) Initial study completed on hemolytic processes in severe clinical burns. This has allowed us to state, with more assurance that

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intravascular hemolysis occurs in all severe burns and that this process does not stop until burn is healed. (Manuscript in preparation).

(5) Have reevaluated in 17 severely burned patients the evidence of severe liver damage early after the burn. This is resulted in concept that efforts should be made to find methods to prevent liver damage as soon as burn therapy is begun. (Manuscript in preparation.)

(6) During the past year on 124 severely burned patients we have almost established validity of concept that 1cc plasma or plasma substitute per kilogram per percent body surface burned is adequate for prevention of burn shock; also that 1cc isotonic salt solution per kilogram per percentage body surface burned is adequate for salt means. These estimates are greatly below those previously stated for severely burned patients. This should enable the Armed Forces to calculate more accurately the plasma, plasma substitute, salt and water needed for stock piling and burn therapy.

(7) Have shown that intestinal antibiotics (aureomycin, terramycin) do not interfere with protein metabolism in severely burned patients (Manuscript in preparation).

(8) Have demonstrated that severely burned patients can be fed by special simple burn dietary formula early after burn is received so that malnutrition is prevented. This concept has been supported firmly by work of Dr. Stanley M. Levenson's group on nitrogen balance.

(9) Have shown that aureomycin does not seem to protect the liver of the burned patient although it is effective in infectious hepatitis.

(10) Have shown for the first time the affect of small amounts of external radiation (100R) on the standard burned dog. Whereas the 20% standard burned dog has no mortality the addition of 100 R external radiation results in approximately 80% mortality in two weeks. Studies on the effect of 25 R are in progress. These studies enable one to calculate the influence of external radiation on the patient burned as a result of an atomic bomb explosion.

(11) Have studied the effects of streptokinase on 11 controlled burned patients. Our studies indicate that streptokinase is ineffective in hastening of separation of burn slough. Studies being continued.

CONTEMPLATED AND PLANNED STUDIES FOR THE COMING YEAR:

(1) Our Mass Spectrometer being completed and ready for operation after initial runs the important study on the mechanism of burn anemia in the clinical burned patient is now possible. We are currently feeding tagged N-15 Glycine to the standard burned dog in order that we might work out carefully the preparation of the samples for the Mass Spectormeter. We hope to start a similar study on the first burned patient in the next six weeks, and hope to study at least four to six severely burned patients by this technique during the coming year. This study, of course, will take

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up a great deal of our research effort but I am sure when completed should enable us to know a great deal more about the causes and mechanism of burn anemia.

(2) When the Army searchlight arrives and is installed Drs. Ham, Brooks and Butterfield and myself hope to produce a standard flash burn in the dog along the same lines as were produced in the standard low temperature burn. When this is done we will have secured data on systemic effects of high and low temperature burns. This should enable us to answer the question, "is the systemic effect of the flash burn (atomic bomb) different than the ordinary low temperature burn?" The answer to this question will supply information on plasma and red cell requirements in atomic bombing.

(3) We hope to find out much more this year in clinical studies on burn patients about the hormone response to severe burns. Studies are set up and underway for estimation of eosinophile response, kitosteroid, oxysteroid and salt excretion in the severely burned.

(4) We will continue to work closely with the Army Medical Nutrition groups here on the various phases of their studies on nutrition of the burn patient.

(5) We will complete the studies on the effect of small amounts of external radiation on the standard burn. This information will allow us to hazard a guess as to how far from the hypocenter the burn victems of an atomic bomb are affected by even small amounts of external radiation.

(6) We are investigating more adequately the value of Dextran for possible use as a plasma substitute in the prevention and treatment of burn shock. To date we have used this preparation in about sixteen patients; our initial study would indicate that it satisfactorily prevents or treats shock in the severely burned patient. We have noted, however, transient urinary findings of casts and minimal hematuria on several patients so hope to determine carefully the renal effect of Dextran in the burned patient in the next year. Steps are being taken with commercial companies to produce Dextran with a Carbon 14 tag so that we can learn more about the fate of Dextran in the animal organism.

(7) Through the cooperative efforts of Johnson & Johnson Company clinical efforts will be pursued for the development of a single, one piece dressing that can be applied rapidly and efficiently to burned victims in atomic warfare. Initial observations during the past three months indicate such a dressing is feasible and may prove valuable. There are many technical points to be worked out and this will be pushed strenously in the coming year.

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