Attachment 1.

REVIEW BOARD ON THE USE OF HUMAN VOLUNTEERS Date_____

CRL

Principal Investigator R. Gilman Trainee investigator(if any)_____

Application No 77-030 Supporting Agency(if Non-CRL)_____

Title of study Malnutrition

Project status:
( ) New Study
( ) Continuation with change
( ) No change (do not fill out rest of form)

Circle the appropriate answer to each of the following(If Not Applicable write NA):

1. Source of Population:
   a) Ill subjects (Yes) No
   b) Non-ill subjects (Yes) No
   c) Minors or persons under guardianship (Yes) No
2. Does the study involve:
   a) Physical risks to the subjects Yes (No)
   b) Social risks Yes (No)
   c) Psychological risks to subjects Yes (No)
   d) Discomfort to subjects (Yes) No
   e) Invasion of Privacy Yes (No)
   f) Disclosure of information possibly damaging to subject or others Yes (No)
3. Does the study involve:
   a) Use of records (hospital, medical, death, birth or other) Yes (No)
   b) Use of fetal tissue or abortus Yes (No)
   c) Use of organs or body fluids (Yes) No
4. Are subjects clearly informed about:
   a) Nature and purposes of study (Yes) No
   b) Procedures to be followed including alternatives used (Yes) No
   c) Physical risks (Yes) No
   d) Sensitive questions Yes (No)
   e) Benefits to be derived (Yes) No
   f) Right to refuse to participate or to withdraw from study (Yes) No
   g) Confidential handling of data (Yes) No
5. Will signed consent form be required:
   a) From subjects Yes No
   b) From parent or guardian (if subjects are minors) Yes No
6. Will precautions be taken to protect anonymity of subjects: Yes No
7. Check documents being submitted herewith to Committee:
   ___ Umbrella proposal - Initially submit an overview(all other requirements will be submitted with individual studies).
   ✓ Protocol (Required)
   ✓ Abstract summary (Required)
   ✓ Statement given or read to subjects on nature of study, risks, types of questions to be asked, and right to refuse to participate or withdraw (REQUIRED)
   ___ Informed consent form for subjects
   ✓ Informed consent form for parent or guardian
   ___ Procedure for maintaining confidentiality
   ___ Questionnaire or interview schedule +

+ If the final instrument is not completed prior to review, the following information should be included in the abstract summary:

1. A description of the areas to be covered in the questionnaire or interview which could be considered either sensitive or which would constitute an invasion of privacy.
2. Examples of the type of specific questions to be asked in the sensitive areas.
3. An indication as to when the questionnaire will be presented to the Board for review.

We agree to obtain approval of the Review Board on Use of Human Volunteers for any changes involving the rights and welfare of subjects before making such change.

Robert H. Gilman

Principal Investigator

Trainee

Received 13/10/77
77-030

SECTION I - RESEARCH PROTOCOL

1. Title: Gastric Acid in Malnutrition

2. Principal Investigator: Robert H. Gilman, M.D.

3. Starting Date: October 13, 1977

4. Completion Date: March 30, 1978

5. Total Direct Cost: $9,957

6. Abstract Summary:

Gastric secretion of 25-30 children with severe Protein-Calorie-Malnutrition (PCM) will be determined at the Nutrition Research Unit. A mercury tipped tube will be passed and basal gastric acid output determined. An injection of 1.5mg/kg of betazole (histalogue) will be given and stimulated gastric acid output collected. Patients will also have basal gastrin levels determined. Gastric contents will be cultured before and after histalog injection. Children with anemia will have bone marrow aspiration on admission. Aspirate will be stained for iron to define whether or not iron deficiency is present. Culture of aspirates will also be performed for the diagnosis of typhoid, and systemic fungal infection. Children at the Children for Families Orphanage will have gastric tube placed and both basal and stimulated gastric secretion determined. These children will be matched either for weight or age and are the controls for the malnourished child.

7. Reviews:

a) Research Involving Human Subjects: _____

b) Research Committee: _____

c) Director: _____

d) BMRC: _____

e) Controller/Administrator: _____

SECTION II - RESEARCH PLAN

A. INTRODUCTION

1. Objective: To determine the effect of malnutrition on gastric acid production.

2. Background: Reduced gastric acid is associated with an increased susceptibility to enteric disease produced experimentally. Furthermore, people who have had gastrectomies are at a greater risk of contracting cholera or salmonellosis than the population at large.[1] Depressed gastric acid is also associated with bacterial colonization of both the stomach and the jejunum;[2,3,4] and jejunal bacterial colonization is associated with malabsorption and can cause diarrhea (bile salt deconjugation).

The causes of hypochlorhydria are not known but both iron deficiency[6,7] and protein-calorie-malnutrition have been associated with decreased gastric acid secretion. There is evidence of two types of iron deficiency anemia, one due to recent blood loss in which gastric atrophy is absent and another type associated with gastric atrophy, parietel cell antibody and occasional malabsorption.[6,7,8] It is not certain whether these are two separate conditions or just a sequence of reactions.

In normally nourished children with iron deficiency anemia, gastric acid secretion is reduced but improves after iron therapy. Whether long standing iron deficiency anemia in children produces achlorhydria is not known.

In limited studies gastric acid has been found to be decreased in malnourished children.[4,10,11] If true, this may precipitate a vicious cycle of increased episodes of infections and diarrhea, increased malabsorption of both iron and other foodstuffs and again more secondary malnutrition and a further decrease in gastric acid.

Gastric secretion studies in malnourished children are limited. In a study done in Nigeria achlorhydria was found which was histamine fast. This study reported in abstract form only provides no specific details of the study. A study performed in Brazil uses a small number of subjects. Although stating that some of the patients are malnourished no other data is provided.[4] In addition, only pH was determined in this study. Neither age nor weight related secretory rates are studied. They did find, however, that normal breast fed children had higher pH's compared to normal bottle fed babies.

Only one study is adequate. In this study children with kwashiorkor were found to have decreased acid secretion and this correlated with gastric atrophy and round cell inflammation found in gastric biopsies.[11] This study did not resolve the role of iron deficiency in producing hypochlorhydria nor did it correlate its findings with bacterial colonization of the stomach. Furthermore, marasmic children were not studied.

It is interesting that in a study in the Punjab it was noted that gastric hyposecretion correlated with malabosorption rather than iron deficiency per se.[8] Patients with blood loss and iron deficiency

did not have decreased gastric secretion.

The importance of iron deficiency in malnourished children in relation to depression of gastric acid production has not been studied. In addition, even if iron deficiency is found associated with hypochlorhydria it is not known whether acid production will improve after iron therapy alone.

In this study severely malnourished children will be compared to age-matched children who are in the 80 to 100 percentile of height for weight (International Standard), and to children of the same weight. Serum ferritin correlates well with iron deficiency in adults.[9] It rises however with inflammation[12] and the effect of malnutrition has not been described. Therefore, initially all malnourished children with anemia will have bone marrows performed since this is the only absolute method of defining iron deficiency. In addition, the bone marrow aspirate will serve as a culture source for acid fast bacteria, fungi, typhoid and possible other bacteria.

Studies on gastric secretory patterns of children show a correlation between lean body mass and stimulated maximal acid obtained, after histamine stimulation.[13,14,15] It is not clear which provides a closer correlation, age or weight in children since they are linked variables.

Gastric colonization with bacteria has been shown to occur at high rates in achlorhydria.[4] Decreased gastric acid has also been shown to

correlate with jejunal overgrowth.[4]

Finally, gastric biopsies in malnourished children have not been performed except in one study.[9] It should be possible to study gastric atrophy in malnutrition by dropping a suction capsule immediately after death and obtaining gastric mucosa.

Basal serum gastrin is raised when parietel cell atrophy is present.[16] Levels in malnutrition have not been described. If achlorhydria in malnutrition is due to gastric atrophy increased levels of gastrin would be expected to be found.

3. Rationale: Malnourished children will have sequential gastric acid determinations performed. Gastric acid will be determined on an age-matched and a separate weight-matched group of controls. This will isolate these variables for analysis. Gastrin levels will be determined and if death occurs a gastric capsule will be dropped and a biopsy taken to define whether true gastric atrophy is present.

The degree of iron deficiency, if any, will be defined by bone marrow iron staining. This will enable us to determine if reduced gastric acid in PCM is associated with reduced iron stores.

Culture of gastric juice before and during stimulation will be used as a functional assay of the ability of the stomach to inhibit bacterial growth.

B. SPECIFIC AIMS

1. To define whether gastric acid is reduced in malnourished children.
2. If reduced, to show if this is related to iron deficiency anemia.
3. To note changes in gastric acid after nutritional rehabilitation.
4. To establish the utility of ferritin as a measure of iron deficiency in malnutrition.
5. To define gastric morphology in malnourished children post-mortem using a suction capsule.
6. To study gastric overgrowth by quantitative aerobic bacterial counts of basal and stimulated gastric juice in malnourished children.
7. To determine the efficacy of bone marrow isolation of bacterial pathogens in malnourished children.

C. METHODS OF PROCEDURE

Patients: Children who fit the criteria of kwashiorkor (edema, hypoproteinemia, enlarged liver, skin and hair changes) and children below the 65 percentile of the International Standard of height for weight will be eligible for study. Children below 3kg of weight will be excluded for convenience. Also, because many of these children may have been malnourishe since birth it will be difficult to assume that normal gastric acid secretio was present prior to the onset of malnutrition.

On admission, all children will have a hematocrit, CBC, differential count and serum specific gravity. Blood culture will be drawn and a bone marrow

aspirate performed in anemic children. Stool microscopic examination and culture will be done. BUN, creatinine, total protein, protein electrophoresis and electrolytes will be determined from specimens of peripheral blood. Patients thought to be infected will routinely have blood, urine, tracheal aspirate specimens taken for culture. Chest X-ray will also be performed. I.V. hydration and antibiotic therapy will be given as clinically indicated. An intermediate strength PPD skin test will be placed.

Gastric secretion studies will be performed on the 1st or 2nd day following admission. Before the test, the patient will receive I.V. glucose and if necessary electrolyte solution. Nothing will be given by mouth for 4-6 hours prior to the test. If no vein can be found, the test will be delayed till the following day or until an intravenous route can be obtained. A nasogastric tube will be passed after a 2cc sample of clotted blood is taken for ferritin and gastrin levels. After an initial 15 minute sample of gastric juice is discarded, basal samples will be collected in 15 minute aliquots for 1 hour. Betazole (Histalog) given as a 1.5mg/kg dose will be given as a secretory stimulus and secretions will then be collected for an additional 90 minutes, in 15 minute blocks. Histamine or its analogue has been used for children gastric secretion tests for over 20 years.

Gastric juice will be sampled during the basal and stimulation periods for aerobic quantitative culture. Gastric acidity will be determined by titrating with 0.01 NaOH to pH's of 3.5 (free acid) and 7.0 (total acid). The results will be expressed as MEQ/hour per 10kg. Bone marrow aspirate

performed in malnourished children will be innoculated into a blood culture bottle both for aerobic and anerobic bacteria. Gastric acid will be quantitatively plated on blood agar, saborauds agar and MacConkey's agar. All separate types of colonies would be identified by routine means. Bone marrow will be cultured for fungus on saboraud agar and on Lowenstein-Jensen agar for AFB. Colonies which are acid-fast positive will be stocked and sent to Baltimore for confirmation. Bone marrow aspirate particles will be stained for iron using the Potassium ferrosyanide (Prussian Blue) reaction. A smear will also be made and stained for Giemsa, Gram, Kenyon and PAS stains. Serum gastrin and ferritin levels will be assayed by radio-immune assay, in a collaborating laboratory.

Children at the orphanage will have a hematocrit and serum specific gravity performed. Bone marrow will not be done on these children. Blood for ferritin and gastrin studies (basal and stimulation) will be drawn. Also, no intravenous therapy with glucose will be given prior to testing.

Children dying at Cholera Hospital whose parents give consent will have a capsule dropped and a post-mortem biopsy taken of the stomach. Height and weight will also be determined.

Statistical analysis: Prevalence of gastric achlorhydria will, in study and control patients, be compared by chi square test. Comparison between groups, of basal and stimulated MEQ of Hcl per hour will also be performed using the T test. Regression lines in normal children will be drawn for

MEQ/kg/hour and age or weight and a correlation coefficient determined.

The time needed for the study will be 7 months. Thirty patients at the NRU will be studied and 50-60 patients at the Orphanage. NRU patients will be studied on admission, 3 weeks, 6 weeks and if possible at 3 and 6 months after discharge. Orphanage children will be studied once only.

D. SIGNIFICANCE

To understand the relationship between malnutrition and gastric acid and its effect on host susceptibility. Therapy with iron could be a useful intervention and might prevent or treat achlorhydria.

E. FACILITIES REQUIRED

A large portion of this study will be performed at the NRU at New Eskaton Road. Use of their general laboratory facilities will be required. No extra hospital beds are needed.

Animal resources - not required.

No vehicle other than the JHU-NRU shuttle will be required.

F. COLLABORATIVE ARRANGEMENTS

Arrangements depend on where gastrin and ferritin assays will be performed. A volunteer nutritionist will be responsible for the co-ordination of this project as part of University of Helsinki thesis work. The Children for Families Orphanage is participating in this study.

REFERENCES

1. Giannella, R.A. et al. Influence of Gastric Acidity on Bacterial and Parasitic Enteric Infections. Annals of Internal Medicine 78:271-276, 1973

2. Frederidsen, W. et al. Assessment of the Relationship between Gastric Secretory Capacity and Jejunal Bacteriology. Scand. J. Gastroent. 5:353-359, 1966

3. Broido, P.W. et al. Upper Intestinal Microfloral Control. Arch. Surg. 106:90-93, 1973

4. Maffei, H.V.K. & Nobrega, F.J. Gastric pH and microflora of normal and diarrhoeic infants. Gut. 16:719-726, 1975

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8. Cowan, E. et al. The gastric mucosa in anaemia in Punjabis. Gut. 7:234-243, 1966

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overload. J. Clin. Path. 25:326-329, 1972

10. Adesola, A.O. The Influence of Severe Protein Deficiency (Kwashiorkor) on Gastric Acid Secretion in Nigerian Children. Brit. J. Surg. 55:866, 1968

11. Wittmann, W. et al. An Evaluation of Gastric Acid Secretion in Kwashiorkor by Means of the Augmented Histamine Test. S.A. Medical Journal 2:400-406, 1967

12. Lipschitz, D.A. et al. A Clinical Evaluation of Serum Ferritin as an Index of Iron Stores. The New England Journal of Medicine 290:1213-1216, 1974

13. Ghai, O.P. et al. An Assessment of Gastric Acid Secretory Response with 'Maximal' Augmented Histamine Stimulation in Children with Peptic Ulcer. Arch. Dis. Childh. 40:77-79, 1965

14. Rodbro, P. et al. Gastric Secretion in Early Childhood. The Lancet 730, 1966

15. Hume, R. & Melrose, A.G. Relation between Maximal Acid Output of Stomach and Lean Body Mass. British Medical Journal 2:30-31, 1967

16. McGuigan, J.E. & Trudeau, W.L. Serum Gastrin Concentrations in Pernicious Anemia. The New England Journal of Medicine 358-361, 1970

PROCEDURES FOR MAINTAINING CONFIDENTIALITY

Patients admitted to the study will be given a study number; records will be kept according to study number and all data will be kept in a locked file in the investigator's locked office. Following completion of the study, all identifying information will be cut off from the data sheet and the clinical information only will be kept at the Cholera Research Laboratory in a locked data storage office. Results of the study will be published in a medical journal and no identifying information will be included in the report of this study.

CONSENT FORM

I understand that my child is admitted for treatment of malnutrition.

Whether or not he participated in the study will in no way penalize him from receiving the routine therapy given at the NRU at New Eskaton Road.

I understand in this study that my child will swallow a tube which will determine the digesting and acid power of the stomach. He will also receive an injection which may produce slight flushing and headache.

If he is anemic, a bone marrow aspirate will be performed. This will require a local anesthetic and will be painful. This will help determine the cause of the low blood present.

My child will also have a total of 10cc's blood drawn for research purposes during each 3 week period of hospitalization.

My child will swallow the tube for collection of stomach juice 3 times in a 6 week period. This will tell us whether or not his acid power is high or low.

I realize that I may withdraw my child from this study at any time and that he or she will receive the same therapy as he would otherwise normally receive.

_____

Signature

_____

Date

POST-MORTEM CONSENT

I give consent for a tube to * passed into his stomach and a small snip of tissue to be taken from his stomach. His body will not be marked in any way.

_____
Signature

_____
Date

ABSTRACT SUMMARY

This study will determine basal and stimulated gastric acid secretion in malnourished and well-nourished controls. Since iron deficiency is thought to be associated with decreased gastric acid secretion, malnourished children with anemia (hematocrit below 36) will have bone marrow aspirates performed.

None of the procedures performed carry a significant risk. The benefit of doing a bone marrow will be if iron deficiency is found an injection of Imferon will be given using a standardized dose. In addition, culture of the marrow will be performed. Bone marrow aspiration will be performed over the posterior illiac crest. The major problem with bone marrow aspiration is pain. Good local anethesia should help alleviate much of this.

Gastric tubes are used for feeding apathetic malnourished children. These tubes left in place can also serve as feeding tubes. The risk in placing the tube is minimal.

All children will receive the same therapy as they would have received routinely. Intravenous glucose will be given prior to the study to prevent hypoglycemia with a 4 hour fast. The term of hospitalization is the same as routinely used at the NRU.

The number of malnourished patients needed for the study is between 25-30.

Better nourished children will serve as age and weight-matched controls. Gastric tubes will be passed and gastric acid secretions tested. Although

somewhat uncomfortable, if done patiently, most children will tolerate it quite well. Bone marrow aspiration will not be performed in this group as it is felt that the benefit to discomfort ratio is not sizable.

The benefits to be obtained will be the understanding of the relationship of gastric secretion to malnutrition. In malnourished children, specific benefits will be better diagnosed anemia which will then be treated and better isolation of infectious agents from bone marrow cultures.

SECTION III - BUDGET

A. DETAILED BUDGET

1. PERSONNEL SERVICES

	Name	Position	% of effort	Annual Salary	Project Requirements TAKA	DOLLARS
1.	Dr R. Gilman	Principal Investigator	10%	$ 33,000		3,300
2.	Dr K. Brown	Co-investigator	10%	$ 16,200		1,620
3.	Mrs. R. Partanen	Volunteer from the University of Helsinki	100%	-		-
4.	Chemistry Technician		100%	Tk10,000	10,000	
5.	Lab Technician at NRU		100%	Tk 7,200	7,200	
6.	Study Nurse at NRU		100%	Tk 8,340	8,340	
7.	Bacteriologist Technician		50%	Tk13,255	6,628	
8.	Dr M. Islam -	Consultant	40%	Tk45,000	18,000	
9.	Two nurses aides at Orhpanage		100%	Tk 4,800	9,600	
10.	Histology research technician		30%	Tk14,000	4,200	
					63,968	4,920

2. SUPPLIES AND MATERIALS

1)	Culture media - anerobic included		3,000
2)	Gastric tubes		500
3)	Reagents		1,000
4)	Miscellaneous		500
5)	Histalog		1,500
		Sub-total	6,500

3. EQUIPMENT

All present at either NRU or CRL. Orphanage need refrigerator.

4. PATIENT HOSPITALIZATION

As covered in JHU to SCF agreement.

5. OUTPATIENT CARE

Orphanage studies. Requirements:

1) refrigerator for study materials

6. CRL TRANSPORT

Travel to Orphanage and NRU - CRL either Hopkins van or CRL 1,400

7. TRAVEL AND TRANSPORTATION OF PERSONS -

8. TRANSPORTATION OF THINGS 1,000

9. RENT, COMMUNICATION AND UTILITIES 1,200

10. PRINTING AND REPRODUCTION -

11. OTHER CONTRACTUAL SERVICES 1,500

12. CONSTRUCTION, RENOVATION, ALTERATIONS -

BUDGET SUMMARY

	Category	Year 1 TAKA	Year 1 DOLLARS	Year 2
1.	Personnel	63,968	4,920	-
2.	Supplies and Materials	6,500		-
3.	Equipment	-		-
4.	Patient Hospitalization	-		-
5.	Outpatient Care	-		-
6.	CRL Transport	1,400		-
7.	Travel and Transportation of persons	-		-
8.	Transportation of Things	1,000		-
9.	Rent, Communication and Utilities	1,200		-
10.	Printing and Reproduction	-		-
11.	Other Contractual Services	1,500		-
12.	Construction, Renovation, Alterations	-		-
		75,568	4,920	

Total Direct Cost = $9,957

Conversion rate $U.S.1 = Tk. 15

SECTION I - RESEARCH PROTOCOL

Replacement pages
77-030

1. Title: Gastric Acid in Malnutrition

2. Principal Investigator: Robert H. Gilman, M.D.

3. Starting Date: October 13, 1977

4. Completion Date: March 30, 1978

5. Abstract Summary:

Gastric secretion of 25-30 children with severe Protein-Calorie-Malnutrition (PCM) will be determined at the Nutrition Research Unit. A mercury tipped tube will be passed and basal gastric acid output determined. An injection of 1.0mg/kg of betazole (histalogue) will be given and stimulated gastric acid output collected. Patients will also have basal gastrin levels determined. Gastric contents will be cultured before and after histalog injection. Children (80% height for weight) will have gastric tube placed and both basal and stimulated gastric secretion determined. These children will be matched either for weight or age and are the controls for the malnourished child.

6. Reviews:

a) Research Involving Human Subjects: _____

b) Research Committee: _____

c) Director: _____

d) BMRC: _____

e) Controller/Administrator: _____

gastric atrophy is present.

Culture of gastric juice before and during stimulation will be used as a functional assay of the ability of the stomach to inhibit bacterial growth.

3. SPECIFIC AIMS

1. To define whether gastric acid is reduced in malnourished children.
2. To note changes in gastric acid after nutritional rehabilitation.
3. To define gastric morphology in malnourished children post-mortem using a suction capsule.
4. To study gastric overgrowth by quantitative aerobic bacterial counts of basal and stimulated gastric juice in malnourished children.

4. METHODS OF PROCEDURE

Patients: Children who fit the criteria of kwashiorkor (edema, hypoproteinemia, enlarged liver, skin and hair changes) and children below the 65 percentile of the International Standard of height for weight will be eligible for study. Children below 3 kg of weight will be excluded for convenience. Also, because many of these children may have been malnourished since birth it will be difficult to assume that normal gastric acid secretion was present prior to the onset of malnutrition.

On admission to the Nutrition Research Unit hospital all children will have a hematocrit, CBC, differential count and serum specific gravity. Blood culture will be drawn. Stool

Serum gastrin will be assayed by radio-immune assay, in a collaborating laboratory.

Children more than 80% height for weight will have a hematocrit and serum specific gravity performed. Blood for gastrin studies (basal and stimulation) will be drawn. Also, intravenous therapy with glucose will be given prior to testing.

Children dying at Cholera-Hospital whose parents give consent will have a capsule dropped and a post-mortem taken of the stomach. Height and weight will also be determined.

Statistical analysis: Prevalence of gastric achlorhydria will, in study and control patients, be compared by chi square test. Comparison between groups of basal and stimulated mEq of Hcl per hour will also be performed using the T test. Regression lines in normal children will be drawn for mEq/kg/hour and age or weight and a correlation coefficient determined.

The time needed for the study will be 7 months. Thirty patients at the NRU will be studied and 50-60 control patients. NRU patients will be studied on admission, 3 weeks, 6 weeks and if possible at 3 and 6 months after discharge.

SIGNIFICANCE

To understand the relationship between malnutrition and gastric acid and its effect on host susceptibility. Therapy with iron could be a useful intervention and might prevent or treat achlorhydria.

FACILITIES REQUIRED

A large portion of this study will be performed at the NRU at New Eskaton Road. Use of their general laboratory facilities will be required. No extra hospital beds are needed.

Animal resources - not required.

No vehicle other than the JHU-NRU shuttle will be required.

COLLABORATIVE ARRANGEMENTS

Arrangements depend on where gastrin and ferritin assays will be performed. A volunteer nutritionist will be responsible for the co-ordination of this project as part of University of Helsinki thesis work.

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10.	Histology research technician		30%	Tk14,000	4,200	
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2. SUPPLIES AND MATERIALS

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2)	Gastric tubes	500
3)	Reagents	1,000
4)	Miscellaneous	500
5)	Histalog	1,500
	Sub-total	9,500

EQUIPMENT

All present at either NRU or CRL. Orphanage need refrigerator.

PATIENT HOSPITALIZATION

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OUTPATIENT CARE

Orphanage studies. Requirements:

1) refrigerator for study materials

CRL TRANSPORT

Travel to	NRU - CRL either Hopkins van or CRL	1,400
TRAVEL AND TRANSPORTATION OF PERSONS		-
TRANSPORTATION OF THINGS		1,000
RENT, COMMUNICATION AND UTILITIES		1,200
PRINTING AND REPRODUCTION		-
OTHER CONTRACTUAL SERVICES		1,500
CONSTRUCTION, RENOVATION, ALTERATIONS		-

BUDGET SUMMARY

Category	Year 1 TAKA	Year 1 DOLLARS	Year 2
1. Personnel	63,968	4,920	-
2. Supplies and Materials	9,500		-
3. Equipment	-		-
4. Patient Hospitalization	-		-
5. Outpatient Care	-		-
6. CRL Transport	1,400		-
7. Travel and Transportation of persons	-		-
8. Transportation of Things	1,000		-
9. Rent, Communication and Utilities	1,200		-
10. Printing and Reproduction	-		-
11. Other Contractual Services	1,500		-
12. Construction, Renovation, Alterations	-		-
	78,568	4,920	

Total Direct Cost = $10,158

Conversion rate $U.S.1 = Tk. 15