

**PLAINTIFF'S
EXHIBIT**

ETCO-229

MEDICAL DEPARTMENT MANUAL
E T H Y L C O R P O R A T I O N

Baton Rouge Plant

P.O. Box 341

Baton Rouge, Louisiana 70821

Size: 200 Acres

Employees: Approximately 1500

E-06196

ETC 00133

Information

E-06197

ETC 00134

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PRODUCTS AND BRIEF HISTORY OF COMPANY

Product or Service:

1. Corporate-wide:

Chemicals - 48%; plastics - 30%; paper - 11%;
aluminum - 10%.

2. Baton Rouge:

Alkyl lead antiknock fluids; solvents; polyvinyl
chloride resins.

Brief History of Company:

The Ethyl Corporation originated with the discovery by Charles F. Kettering of tetraethyl lead as an antiknock agent which prevents knock in gasoline engines and thereby increases their efficiency. Incorporated in 1924, Ethyl was owned equally by General Motors Corporation and Standard Oil of New Jersey. Its first president was Mr. Kettering who was also responsible for the development of the electric cash register, the electric automobile starter and the railroad diesel locomotive. In 1962 the parent companies sold their interest and Ethyl went public. Formerly a one-product company, Ethyl immediately began diversifying into other products which increased sales volume fivefold to one billion dollars in 1974. Ethyl is a worldwide manufacturing company with foreign plants in Canada, Greece and Belgium.

The Baton Rouge plant was constructed in 1937. It is the principal alkyl lead manufacturing facility for Ethyl Corporation. The principal Research and Development facility for the Corporation is located within the boundaries of the Plant.

F-06203

T. D. F. 6/10/75

ETC 00140

MEDICAL POLICY

Ethyl Corporation recognizes that health maintenance is primarily the responsibility of the individual. Because of its interest in the health of its employees and the possible relationship of its operations and products to health, the company supports an occupational health program.

Objectives:

1. To protect employees against health hazards in their work environment;
2. To facilitate the placement and insure the suitability of individuals according to their physical capabilities, mental abilities, and emotional make-up in work which they can perform with an acceptable degree of efficiency and without endangering their own health and safety or that of their fellow employees;
3. To assure adequate medical care and rehabilitation of the occupationally ill and injured;
4. To encourage personal health maintenance.
5. To provide emergency care for personal illness as necessary to preserve life or limb; and
6. To provide minor medical assistance for personal illness in order to enable the employee to finish his work day or for conditions for which he would not ordinarily seek the care of personal physician.



Principles

1. The professional staff should be ethical, capable and alert to the advances in medicine and changes in the social, legal, and economic aspects of medical care.
 2. The full support and understanding of all personnel is necessary for the success of the medical program. This requires adequate stature for the medical staff and their active participation in matters affecting employee health.
 3. The program does not interfere with the relationships of employees with their personal physicians, but supplements rather than replaces or competes with the services of the latter.
 4. The participation of employees in the health maintenance program is on a voluntary basis wherever this is compatible with their own safety and that of others, as well as with applicable legal regulations.
 5. The information obtained in the course of the occupational health program is held confidential and is not revealed to anyone except at the written request of the employee concerned or when required by law.
 6. The medical program should function within the generally recognized scope of occupational medicine as an integral part of the community health resources.
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Medical Service

F-06206

ETC 00143

PART II

MEDICAL SERVICE

E-06207

ETC 00144

PLANT MEDICAL DIRECTOR

Frank M. Buckingham, M.D., F.A.C.S.
7388 Sheffield Court
Baton Rouge, La.
923-2592

CORPORATE MEDICAL DIRECTOR

Gilbert B. Meyers, M.D.
Ethyl Medical Department
451 Florida Atreet
Baton Rouge, La.
387-1838 (Home)

ASSOCIATE CORPORATE DIRECTOR

Walter Hulon, M.D.
Ethyl Medical Department
451 Florida Street
Baton Rouge, La.
293-3353 (Home)

ASSISTANT TO PLANT PHYSICIANS

Wanda Spiers, R.N., COHN
444 Frances Harriet Dr.
Baton Rouge, La.
927-6076

MEDICAL ADMINISTRATIVE ASSISTANT

Charles W. Bruton
275-4993

INDUSTRIAL HYGIENIST

Terry Maples

PLANT MANAGER

M.M. Koenecke

PERSONNEL SUPERVISOR

Henry DeCuir

SAFETY SUPERVISOR

B.J. Lentz

INDUSTRIAL INSURANCE

Earl H. Rachal

E-06208

ETC 00145

Cardiology

David W. Wall
3849 North Blvd.
Phone: 387-0529

Dermatology

Joe Tilley
8220 Goodwood Blvd.
Phone: 923-1515

Charles Black
4550 North Boulevard
Phone: 924-6256

Henry W. Jolly
Carlton L. Carpenter
I. J. Sherman
1415 Main Street
Phone: 348-3194

Diseases of the Chest

Thomas P. Thigpen
Clay Waggenpack, Jr.
3849 North Blvd.
Phone: 926-8128

James H. Lutschg
8415 Goodwood Blvd.
Phone: 923-1515

Ear, Nose & Throat

McHugh Simmons
J. W. McLaurin
3888 Government
Phone: 344-5239

Eye - Ophthalmologists

R. C. Caffarel
Kirk A. Patrick
Paul L. Marks
E. E. Afeman
Albion B. Cross
C. A. Fargason
5246 Brittany Dr.
Phone: 766-7441

Neurosurgery

William L. Fisher
3849 North Blvd.
Phone: 387-4936

Edward S. Connolly
1515 Jefferson Highway
New Orleans, LA
Phone: 834-7070

Thomas B. Flynn
244 Peachtree Blvd.
Phone: 387-0936

Neurology

Sam L. Levert
Suite 112
4560 North Blvd.
Phone: 927-1495

Orthopedics

Samuel Irwin
Kenneth C. Cranor
Jack F. Loupe
John F. Loupe
3955 Government St.
Phone: 387-0603

Moss M. Bannerman
Thomas Campanella
Alan C. Farries
Joe A. Morgan
5630 Bankers' Ave.
Phone: 927-0050

Plastic Surgery

W. H. Kisner
606 Colonial Dr.
Phone: 926-1710

Psychiatry

F.A. Silva
625 Colonial Drive
Phone: 927-1050

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ETC 00146

PANEL OF CONSULTANTS - contd.

Radiology

Dean W. Geheber
Allie Woolfolk
Thomas R. Jenkins, Jr.
3888 Government
Phone: 344-3753

Surgery

Millard E. Byrd, Jr.
3919 Convention St.
Phone: 343-3467

Don R. Cowick
Leo A. Farmer
3849 North Blvd.
Phone: 383-0383

Hand Surgery

Joe Morgan
5630 Bankers Ave.
Phone: 927-0050

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Community Resources

Baton Rouge General Hospital
3600 Florida Boulevard
P. O. Box 2511
Baton Rouge, Louisiana 70821
Phone: 387-7000
EMERGENCY ROOMS: 387-7600

Our Lady of The Lake Hospital
1600 Riverside North
Baton Rouge, Louisiana 70802
Phone: 387-1131

Earl K. Long Memorial Hospital
5825 Airline Highway
Baton Rouge, Louisiana 70805
Phone: 356-3361

MediCenter of America, Inc.
3888 North Boulevard
Baton Rouge, Louisiana 70806
Phone: 387-2121

Doctors Memorial Hospital
2414 Bunker Hill Drive
Baton Rouge, Louisiana
Phone: 927-9050

Americare Hospital
3888 North Boulevard
Baton Rouge, Louisiana 70806
Phone: 344-0571

Lane Memorial Hospital
6300 Main Street
Zachary, Louisiana 70791
Phone: 654-4511

East Louisiana State Hospital
Jackson, Louisiana 70748
Phone: 634-2651

Dixon Memorial Hospital
Highway 190 East
Denham Springs, Louisiana
Phone: 665-8211

East Baton Rouge Parish Health Unit
353 North 12th Street
P. O. Box 3017
Baton Rouge, Louisiana 70821
Phone: 343-7411

Ambulance Service Co. of B.R.
3122 Main Street
Baton Rouge, Louisiana
Phone: 344-0566

Poison Control Center
Charity Hospital
1532 Tulane Avenue
New Orleans, Louisiana 70140
Phone: 899-3409
525-3618
524-3617

Hypolite T. Landry, M.D.
East Baton Rouge Parish Coroner
Courthouse
Phone: 389-3047

Baton Rouge Physical Therapy
& Rehabilitation Center
Suite 105
4560 North Boulevard
Phone: 927-9170

BRGH Chemical Dependency Unit
4040 North Boulevard
Baton Rouge, Louisiana
Phone: 387-7970

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General Nursing
Service Information

E-06212

ETC 00149

POLICY REGARDING MEDICAL PERSONNEL

Dress

Nurses and Medical Assistants are expected to wear uniforms and non-dress shoes. Registered Nurses and Medical Assistants to wear white, shift nurses (non-RN's) to wear navy blue. A new employee is authorized five uniforms initially and three per year, thereafter, to be paid for by the Company. Good grooming is essential and is required. Cosmetics and colognes are to be used in good taste. Employees are not to report for work with hair in rollers. Lab coats are to be worn by Medical Assistant. Uniforms will be laundered at Company expense. Nurses are to wear name badges and school of nursing pins. Medical assistants are to wear name badges.

F-06213

ETC 00150

MEDICAL CHARTS

The following order should be maintained in handling and filing charts. Cooperation in this respect will make it easier on us all. The general order, beginning at the front, is as follows:

- A. Index card and death certificate.
- B. Blue cards numbered in red at the top of each blue card with the last number in front.
- C. History sheet (also initial pre-employment, medical questionnaire).
- D. Physical examination yellow cards and sheets. These are arranged with the most recent in the front and the earliest in the rear.
- E. Vinyl examinations, most recent in the front and the earliest in the rear.
- F. Miscellaneous, such as letters, slips, etc., in date order -- the most recent in the front and the earliest in the rear. All correspondence pertaining to a particular incident stapled in the same date order.
- G. EKG's, if more than one, the most recent in front and the others in date order with the earliest in the rear.
- H. Asbestos questionnaire.
- I. Pink laboratory card and, if more than one, again numbered in sequence in red at the top with the most recent in front.
- J. Immunization card.
- K. White lead cards and, if more than one, numbered serially in red at the top and on the front of the card with the most recent in the rear.
- L. Disability wage cards, if more than one, numbered serially in red at the top and on the front of the card with the most recent in the rear.

PROCEDURE FOR BLOCKING CHARTS

The medical secretary will receive chart and order from plant physicians to block chart.

The secretary blocks chart and tells clerk in Disability Wage Office, so that current Disability Wage Card will be blocked.

CODES

	Brown	Diabetes
	Blue	Cardiovascular - Renal
	Orange	Modified Regular Work

Block chart in upper right hand corner and on left upper side put small block, date, doctor and illness (on front of folder).

E-06215

ETC 00152

ORDERING - by R.N. Day Nurse

1) Drugs

Davis Wholesale Drug Company
212 S. 14th Phone 387-1436
Baton Rouge, Louisiana

Call for Mr. Kemp or Ms. Neta Buttons and place order.
Charge to purchase order No. 02524-P5. (To blanket P.O. for the year).
When delivered, check items, sign package slip and give to delivery man.
Keep invoice, OK it and send to accounts payable.
If invoice not correct, call Davis, then correct invoice before sending
to accounts payable.

2) Sight Screener Record Cards

American Optical Company
Safety Products Division
P.O. Box 13288
Houston, Texas 77019

3) Medical Supplies

Bauman Surgical
3722 Convention Street
Baton Rouge, Louisiana 70806

4) Wound closure instrument trays #61204

Made by Acme United Corporation
155 Brookhollow Esplanade
New Orleans, Louisiana 70123

5) X-ray film and EKG Paper

Evangeline Medical and X-ray Distributor
Box 64851
Baton Rouge, Louisiana 70806

6) Uniforms

Nightingale Coat Company
Georgiana, Alabama
or
Mary's Uniform Shop
3629 Florida
Baton Rouge, Louisiana 70806

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ORDERING - by R.N. Day Nurse (Continued)

- 7) Laundry
Highland Cleaners and Laundry
Highland Road
Baton Rouge, Louisiana

Example: Write requisition as below for current year needed.

To cover cost of laundry service to Medical Department
from January 1, 1975 through December 31, 1975 -

- 8) Paper Cups
Write requisition - do not put vendor - send to purchasing
- 9) Stationery
From stationery supply room.
- 10) Hudson Disposable Oxygen Mask #1059
Vallen Corporation
c/o Guardian Safety Equipment Company
Box 66604
Baton Rouge, Louisiana 70806
- 11) Reece Orthopedic Shoe With Wooden Sole #175
Reece Wooden Sole Shoe Company
Columbus, Nebraska

Put 10 items on an order, must have different requisition
and M-number if more than 10 items - write requisition for
all orders except Davis Drug Company. Get M - Number
from secretary - send requisition to purchasing.

E-06217

ETC 00154

CONTROLLED DRUGS

List of Controlled Drugs Used in Department

Demerol Tablets, 50 mg
Demerol ampules, 100 mg
Darvon capsules, 32 mg
Darvon capsules, 65 mg
Donnatal tablets
Lomotil tablets
Morphine Sulfate ampules, 1cc amps., $\frac{1}{2}$ gr/cc
Nembutal capsules, $1\frac{1}{2}$ gr.
Sodium Luminal ampules, 2 gr.
Paregoric
Elixir Phenobarbital
Tylenol tablets, # 3
Valium tablets, 5 mg
Quiagel PG

1. Do not dispense without the written order of the Plant Physicians, except that in emergency situations upon oral prescription reduced promptly to writing.

Exception to the above---Quiagel PG and Darvon may be dispensed per standing orders in Policy and Procedure Manual but, Darvon must have order countersigned by Physician.

2. Record all controlled drugs dispensed in Control Drug Book.
3. In emergency situations, controlled drugs ordered per phone by outside physicians on personal illness may be dispensed but are to be countersigned by Plant Physician.

E-06218

ETC 00155

POLICY AND PROCEDURE

Medical Service for Non-Ethyl Employees on the Plant

I. Non-Ethyl employees on the plant are:

- a. Contractors' employees
- b. Vendors' employees
- c. Service and repair personnel
- d. Salesmen and other visitors

II. Medical service will generally be limited to the following:

- a. Emergency service in cases of severe injuries while arrangements are being made by the injured person's employer to place the individual under care of a retained physician and transport injured to a hospital.

- b. Suddenly-developing illness where some immediate medical assistance is indicated.

When immediate medical follow-up and/or hospitalization is indicated, the employer's availability and cooperation is expected.

- c. Exposure to Ethyl Chemicals

In all cases, the employer's senior representative in charge on the plant will be expected to accompany the employee to the Plant Medical.

In cases where the employee is not represented on the plant, as in the case of visiting salesmen, telephone repairmen, etc., the Ethyl superintendent in charge or his designated alternate will be expected to accompany the non-Ethyl employee to the Plant Medical.

Realistic exceptions may be made to afford assistance as may be occasionally required for:

- a. Guests, visitors, consultants, etc.

E-06219

ETC 00156

- b. Employees of an employer transiently on the plant whose members are few, and whose work is of such nature and/or duration as not ordinarily to justify the employer providing his own first aid facilities.

The Ethyl construction coordinator or superintendent in charge is expected to be available as required for liaison with Plant Medical and the injured employee or personal physician in making such arrangements as may be required for moving the non-Ethyl employee off plant.

Construction Coordinators -- Ext. 2728

David M. Foreman

O. D. Hollingsworth

E-06220

ETC 00157

SPECIAL SAFETY PRECAUTIONS

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Eye Protection

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Contact Lens

131.01

Experience gathered over recent years has shown that there is no medical basis to prohibit the wearing of contact lenses in the plant provided that safety glasses or chemical goggles (depending upon the potential exposure) are worn with them in the plant areas.

- a. Contact lens shall not be worn by any person who normally works in any area outside the plant offices unless permission has been granted by the responsible area supervision.
- b. Anyone wearing contact lens must wear either safety glasses or chemical goggles (depending upon the potential exposure) in any plant area or any control or chemical laboratory.
- c. Contact lens are to be worn at the employee's risk and without liability to the Company.
- d. The SOFT type of contact lens cannot be worn on a regular basis or for extended periods of time in plant areas or chemical laboratories as soft lens can actually absorb chemicals.
- e. Wearing of contact lens with a respirator (any full face piece mask) shall not be allowed.

4/9/81

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ETC 00158

DEATH ON COMPANY PROPERTY

1. Notify the Plant Medical Director. He will immediately notify the East Baton Rouge Parish Coroner.
2. Notify the employee's supervisor. The deceased employee's supervisor will personally notify the family immediately.
3. Do not remove the deceased from the Medical Department until ordered to do so by the Plant Physician.

E-06222

ETC 00159

DAY NURSE R.N. DUTIES

1. Responsible for timely ordering of supplies and equipment.
 - a. Write requisitions
 - b. Receive supplies, check supplies against invoice.
2. Checking bills on occupational cases and forwarding to Industrial Insurance.
3. Keep record of patients sent to outside M.D.'s on OCC cases and consultations.
4. Keep record of pending conditions and date letter received from Industrial Insurance and if made OCC or non OCC.
 - a. Put information on blue card
 - b. File letters in chart.
5. Received letters on OCC cases, send copy to Industrial Insurance and note on blue card.
6. Make appointment for patients with outside M.D.'s on OCC cases.
7. Review partial duty file once a week and call in delinquent patients.
8. Check controlled drugs.

Inventory controlled drugs at least every three (3) months.
9. Report the names of all patients referred to outside M.D. (for plant injury) to Industrial Insurance office.
10. Notify Plant Physicians of employees absent because of reported occupational illness or injury.
11. Give injections and vaccinations as ordered by plant physicians.
12. Assist physician as needed.
13. Check injury file monthly, final by record when indicated and call in delinquent patients.
14. Relieve in Lead Check office as needed.

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ETC 00160

SHIFT NURSES' DUTIES

A. General

1. Receive patients promptly at Dispensary desk.
2. Pull blue card (Dispensary record), attend patients, be courteous and polite.
3. Give treatments if qualified.
4. Get history and record if patient is to see a doctor.
5. Prepare for special procedures by having needed equipment and supplies at hand, assist doctor.
6. File cards back in charts when finished.
7. Responsible for cleanliness and good order of supplies and equipment.
8. Remove used supplies and straighten exam rooms between patients.
9. Replenish stock in Dispensary, emergency O.R. and treatment rooms.
10. Change solutions in instrument trays and thermometers.
11. Set up new disposable mask and humidifier after use. Be sure O₂ is closed off after using O₂ in wards.
12. Clean top of treatment table in Dispensary with soap and water between patients.
13. Clean and defrost refrigerator as needed.
14. Sterilize supplies by autoclaving every six weeks.
15. Relieve in Lead Cheek office as needed.
16. Assist in Disability office as needed.
17. Relieve in Medical Assistant's office as needed. Duties consist of:
 - a.
 - b. Take EKGs, audiograms, pulmonary functions.
 - c. Operate sight screening apparatus.
 - d. Perform tonometry.
 - e. Process personnel for periodic and pre-placement exams.
 - f. Collect and prepare specimens for transmittal to medical laboratory.
 - g. Assist physicians in preparation for examination of individuals.

NURSES' DUTIES--contd.

18. Fill in Shift Performance sheet.
 - a. Record number of patients seen.
 - b. Under sub-contractor, list names and badge numbers of people requesting excuse overtime shift and whether granted or not.
 - c. List name and badge number of all possible TEL exposures.
 - d. List every incident and every contact with plant physician.
 1. Time, badge number and name of patient.
 2. Time, location, patient's name and badge number on ambulance run.
 - e. List time and place of disasters, such as explosions, large fires, chlorine gas or other releases.
19. Fill in employee Daily Log.
20. Type Daily Medical Breakdown
 - a. Make five copies, staple one new injury and one retreat sheet together with the following names or locations on top corner. These will be picked up in the Dispensary in the A.M. on work days for distribution, after being checked by physician's assistant or medical supervisor.
 1. Medical (original)
 2. Safety
 3. Manager of production
 4. TEL Operations
 5. Maintenance
 6. Sodium Operations

F-06225

ETC 00162

Nurses' Duties -- contd.
D. Information put on / Breakdown

1. On New Injuries sheet--Occupational injuries or Pending injuries
(at bottom of page) Injuries of Non-Ethyl Employees on plant
Off Plant injuries

- a. Shift and name of person typing
- b. List in red TEL exposures. Example: Time, Badge number, name, TEL exposure, foremans name.
- c. On Non-Ethyl Employees. Time, Name, Company, nature of injury, foreman.
- d. Off plant injuries. Badge number, Dept. name, nature of injury as stated on the 196 received from the Main Gate.

e. Occupational or Pending Occupational injuries

Time, badge number, sections where works, nature of injury, in parenthesis put foreman's name, if partial duty given put in red after foreman's name, place occurred, retreat date, if made pending or home comp, put in red in retreat column.

2. On Retreat sheet -- Occupational or pending occupational retreatments

- a. Shift and name of person typing
- b. Time, badge number, section where works, patient's name, reported, redressed or retreat and indicate area of body involved, retreat date or if finalized.
 1. Under nature of injury
 - a. If you final injury, put "OK injury of" (date)
 - b. If duty status changed, put as partial, full, modified regular work
 - c. Reopened cases -- example: Reopen case of (date), retreat left knee.
 - d. Patient placed on occupational absence or pending occ. abs. Example: Retreat left knee - occ. abs. as of date, type in red, in retreat column occ. absence or pending occ. absence.
 - e. Patient returned to work after occupational absence or Pending occ. Example: OK for partial or full duty after occ. absence as of (date). In retreat column, put date you told patient to report for retreatment.

E-06226

ETC 00163

ETHYL CORPORATION

INTER-OFFICE

To All Medical Department Personnel ADDRESS
FROM F.M. Buckingham, M.D. ADDRESS
SUBJECT "Off Plant Injury" Reporting DATE 1-5-83

Effective immediately, (1-6-83), all off plant injuries are to be listed on the Daily Medical Breakdown, at the bottom of the page. List the Badge Number, Department, Name and nature of injury as stated on the 196 received from the Main Gate.

The 196's will be picked up at 7:00 A.M. each day and all reported "Off Plant Injuries" are to be listed on the Daily Medical Breakdown prior to distribution.

E-06227

ETC 00164

MEDICAL DIRECTIVES

Medical Directives are written procedures, approved and signed by the physician responsible for the medical direction of the employee health program. Medical Directives serve as the medical authorization for the nurse in giving emergency care to employees for occupational and non-occupational injuries and illnesses.

It would be impossible to include in this Manual all the types of illnesses and injuries encountered in industry for which procedures will be required.

The procedures given are designed to help the nurse function with professional ethics within the framework of established Company policies. The nurse should bear in mind at all times that she is legally required to perform duties assumed by her in carrying out the physician's order in a competent manner and that she may be personally responsible for wrongful acts of negligence even if performed under the authority of a physician. The occupational health nurse must strive constantly to retain the role of nurse and not to assume responsibility outside the range of her professional training and experience. She must use judgment as to what she will undertake. If doubt exists, a physician should be consulted, an Ethyl physician for occupational cases or for questions of Company policy, the patient's private physician for non-occupational conditions.

F-06228

ETC 00165

MEDICAL DIRECTIVES AND NURSING PROCEDURES FOR
EMERGENCY CARE OF OCCUPATIONAL AND
NONOCCUPATIONAL INJURIES
AND ILLNESSES

NAME AND ADDRESS OF COMPANY

ETHYL CORPORATION

P. O. Box 341, Baton Rouge, Louisiana 70821

NAME AND ADDRESS OF PHYSICIAN

Carl B. Myers, M.D.

P. O. Box 341, Baton Rouge, Louisiana 70821

NAME OF NURSE IN CHARGE

Wanda Spiers, R.N., C.O.H.N.

APPROVED:

Date

Signature

M.D.

REVIEWED AND UP-DATED:

Date

Signature

M.D.

Date

Signature

M.D.

F-06229

ETC 00166

MEDICAL DIRECTIVES AND NURSING PROCEDURES

General Procedures

1. Observe the symptoms and determine the need for treatment.
2. Record the presenting complaint, the pertinent medical history and the appearance of the patient.
3. Take temperature, pulse, respiration, and blood pressure when indicated.
4. Repetitive treatment for non-occupational conditions should be discouraged.
5. When referring an employee (at his request) to a physician or dentist, always present more than one name and let the patient make his choice.
6. The Medical Department shall provide essential emergency care for non-occupational injuries and refer the employee to his personal physician for definitive treatment.
7. The nurse should be very careful not to be drawn into making remarks about the merits or demerits of any given diagnosis, plan of treatment or personal or professional attributes of any physician.
8. Do not dispense medicine to a patient who is actually under the care of a physician for the condition concerned.
9. Dressings applied by an outside physician are not to be changed without the written request of the physician unless there is direct evidence of a pressing need for changing. If a dressing is changed, only a sterile, dry dressing with no medication is to be applied unless specifically instructed otherwise by a physician.
10. No narcotics, sedatives, antibiotics or other prescription medicines are to be given to a patient without specific orders from an Ethyl physician.
11. Ordinarily a patient is not to remain at Medical longer than 30 minutes (one hour maximum). Should a patient be unable to return to work at the end of this period, he should be sent home or placed under other medical care.

General Procedures -- contd.

12. Injections will be given only by R.N's.
13. Properly label all drugs dispensed with name, date, directions, dispensed by, and stickers as appropriate, such as: "For External Use Only," "POISON," "Shake Well."
14. Excusing personal illness for prearranged appointments:
 - a. Employee to be excused by Day Nurse, Registered, or Assistant to Plant Physicians, if either is available.
 - b. Medical certification will be forthcoming only if appointment cannot be arranged outside of working hours, and if for non-routine medical matter.
15. Injuries received while playing ball on Ethyl-sponsored teams are non-occupational and should be handled as such.
16. Injuries occurring on parking lots outside Ethyl gates are not occupational injuries unless employee is on a job and working outside gates.
17. Pending injuries: Safety is to be immediately called if case presents during regular hours.
 - a. Injuries reported more than 3 days late.
 - b. Back and knee conditions where no visible sign of injury is noted and/or when no accident occurred.
 - c. When in doubt as to whether injury is plant connected.
18. Broken teeth sustained while eating -- make pending injury.
19. Do not dispense medicines such as Phemerol, Tincture Benzoin, tubes of Neosporin for employees to have on hand at work site or to take home.
20. X-ray and laboratory examinations requested by employees for non-occupational illness or injury will not be done at Plant Medical unless specifically ordered by Plant physicians.
21. Employees are not be allowed to look at their records. These records are for the use and guidance of the Medical staff and are not the property of the employees. This department will comply with the new OSHA Standard, 29CFR 1910.20, Employee's Right to access, in a timely, but orderly manner. See guidelines to be followed.

E-06231

ETC 00168

General Procedures -- contd.

22. Foremen or other members of Supervision are to be told ONLY estimated date of return or date patient is expected to report to Medical on employees off on personal illness.
23. Do not discuss patients with other employees or with anyone outside the Medical Department. Supervision may be given the information recorded on the Injury Slip and information related to anticipated return to work, including restrictions if any, for occupational cases.
24. Confidential information, which may consist of results of examinations, laboratory work, and other procedures, or physician notes contained in the Medical record, must be kept absolutely private and confidential. If any doubt about the proper ethical handling of information exists, refer the matter to a plant physician.
25. Do not dispense medicine to employees off from work due to personal illness.
26. Do not remove sutures unless ordered to do so by Plant Physician. If occupational, have patient report when the Plant Physician is in. If non-occupational, refer the patient to his personal physician.
27. Controlled drugs are not to be dispensed without specific order of a physician and, when so, to be entered in the Controlled Drug Record as well as on the blue card.
28. When necessary to call a physician on occupational illness or injury, call in the following order: Dr. Buckingham, 923-2592; Dr. C. Myers 925-9317; Dr. W. Hulon 293-3353 ; Dr. G. Meyers 924-8060 . Note that Drs. Gil Meyers and Hulon are to be called only if plant physicians are unavailable.
29. Do not call a plant physician regarding personal illness. Exception -- he is to be notified of deaths.
30. Do not take the responsibility for a condition; if you are in doubt, call the doctor on all medical-related problems.
31. For administrative policy and procedure, contact Miss Spiers or Mr. Bruton.
32. Do not give diathermy treatment without written order from personal physician or specific order from an Ethyl physician.

General Procedures -- contd.

33. X-rays on occupational injuries or illnesses are to be ordered by the physician, only.
34. Returning to work after occupational illness or injury (occupational absence).
 - a. Employee to be returned by Day Nurse, registered or Assistant to Plant Physicians. If comes at start of A shift, have wait for Day Nurse.
 - b. If there are no return slips on patients chart or on spindle in Dispensary and no write-up on Medical Treatment Report. saying patient can return, call physician on call for permission to return patient.
35. Personal drugs are not to be ordered through Davis Wholesale by employees.
36. Personal prescriptions for employees will not be filled in Dispensary.
37. Controlled Drugs may not be dispensed or administered without written order of the Plant Physician, except that in emergency situations, upon oral prescription reduced promptly to writing. Exception to the above, Quiagel PG, Parepectolin and Darvon may be dispensed per standing orders
38. Treatments, such as hot packs or whirlpool, are to be given only one time daily and for no longer than 20 minutes.
39. The Registered Nurses will handle all Partial Duty recommendations and reviews when on duty. At other times, the nurses on duty may recommend Partial Duty for only the period of time not covered by the RNs. In most cases this should not be for more than one (1) day or a weekend. Employees will be instructed to come back for review during the RNs' working hours. Physicians will review all Partial Duty recommendations requiring more than one working week.

Partial Duty will:

 1. Specify clearly the reason
 2. Be recorded with appropriate information on the Medical Progress Record.
 - (a) Date
 - (b) Time in.
 - (c) Reason for.
 - (d) Foreman notified.
 3. Be recorded on the First Aid Performance sheet (under "Recommend No Overtime") for physician review each workday.

ETHYL CORPORATION

INTER-OFFICE

To Site Medical Departments ADDRESS *BRP*

FROM G. B. Meyers ADDRESS Baton Rouge

SUBJECT Pseudofolliculitis Barbae -
Respirator Usage DATE November 17, 1982

The following states the policy we have jointly developed with Toxicology and Industrial Hygiene for people complaining of "shaving bumps". If you have any questions, please contact Corporate Medical.

Pseudofolliculitis barbae of the beard (ingrown hairs) results when stiff hair tips penetrate into the skin provoking small pustules. The pustules are easily cut during shaving.

An individual alleging pseudofolliculitis should report to the Medical Department for a physician examination. If the diagnosis is confirmed, the company physician will inform the foreman in writing of the diagnosis. This will authorize the foreman to permit the individual to grow a beard no greater than a quarter of an inch in length. The beard may be trimmed with a pair of small scissors or special razor. The employee must then pass a respirator qualitative fit test administered by a person specially trained in respirator fitting. The result must show that the seal of the respirator is adequate to provide the protection needed. Quantitative fit testing is satisfactory at those locations where it is used instead of the qualitative test. Supervision must assure that the beard is kept trimmed not to exceed one quarter inch.

G. B. Meyers
G. B. Meyers

GBM:es

E-06234

ETC 00171

PLANT AMBULANCE

Phone: 3118 - 2614

Location: Main Gate

Security is responsible for maintenance of ambulance and for driving on calls. Oxygen tanks in ambulance are replaced by Security.

Calls for ambulance will be received in Medical. Ask caller for location at which ambulance is needed and ascertain nature of emergency. Call Main Gate for ambulance, give location needed. Get emergency bag from O.R. and wait outside. There should be someone waiting in the area to direct you to the patient. Respiratory protection devices (masks) are kept in the ambulance for your use if going into area where needed. The guard will get the stretcher; the guard and men in the area will put the patient on stretcher and into ambulance under your direction. Be sure to check to see that stretcher is properly fastened with bracket on side. If you need additional help getting the patient out of the ambulance at Medical, have someone from the area come with you. Have the guard stay with you if assistance is needed in the Medical Dept.

Medical approval for payment of outside ambulance bill will be given if it is necessary to transport patients to hospitals or physician's office. Copy of bill is to be retained and given to C. Bruton or W. Spiers.

E-06235

ETC 00172

If necessary to send patient to hospital in ambulance:

1. Call for outside ambulance.
2. Notify Main Gate that ambulance will be coming in.
3. If medicine was given to patient, record with time given on tag and tie to shirt where it can easily be seen. Also, tell ambulance attendant.

When guards are no longer needed, give them:

1. Patient's name, badge number and complaint.
2. Clean stretcher from Ward.
3. One Medical Service Slip if the patient is excused.

Make write-up on blue dispensary card, record in detail:

1. Time of call and location.
2. Symptoms
3. Vital signs
4. Time and name of physician called.
5. Rx given.

Record ambulance run on Shift Performance Sheet (note time and location).

E-06236

In some instances where speed in getting a patient to the hospital is of utmost importance, the Plant ambulance may be used to take the patient to the hospital. Always transport directly to hospital Emergency Room in Plant ambulance if CPR is being administered. If a situation is serious enough to require the Company ambulance to leave the Plant with a patient, a nurse, shift nurse or M.D. ordinarily should accompany the patient (unless other injured employee, etc., make the presence of the nurse in the Medical Department seem to be the more prudent decision).

MEDICAL DIRECTIVES AND NURSING PROCEDURES

Emergency Situations

The nurse in industry must be able to function in any emergency situation. She is expected to have professional competence and skill and use good judgment at all times.

General Principles Applicable in All Emergency Situations:

1. Think clearly.
2. Do first things first.
3. Do no more than is actually needed.

General Procedures Applicable in Serious Emergency Situations:

1. Restore breathing and maintain open airway.
2. Control bleeding.
3. Prevent and treat for shock (see shock).
4. Call a physician.
5. Provide the physician with as much history and information as possible about the injury or illness, including temperature, pulse, blood pressure, etc.
Arrange for follow-up care and record all pertinent data.
6. Prevent infection and further injury.

Additional Medical Directives Applicable in Emergency Situations:

Hemorrhage:

1. Call the physician.
2. Expose the wound.
3. Remove loose, surface foreign matter.
4. Apply firm pressure over sterile gauze directly over bleeding.

E-06237

ETC 00174

MEDICAL DIRECTIVES AND NURSING PROCEDURES

Emergency Situations

site. Avoid use of a tourniquet if possible. If direct pressure does not control bleeding from an extremity, use a blood pressure cuff as a tourniquet.

Remember:

1. A tourniquet must be released every 15 minutes.
2. No dressing should be applied which would conceal the tourniquet.
3. Any person assuming care of the patient should be informed of the presence of the tourniquet.

Asphyxia: Cessation of breathing

1. Mouth - to - mouth resuscitation (12 - 15 inflations per minute) at once and maintained until breathing is restored or a physician directs otherwise.
2. Notify a physician.

Shock: Symptoms of shock following injury are pallor, perspiration, rapid thready pulse.

1. Notify physician.
2. Remove cause for shock, if possible (control hemorrhage, relieve pain by medication as ordered by a physician for the specific case).
3. Keep patient warm, dry, on his back with head low.

Unconsciousness: Fainting produces unconsciousness of short duration.

Pallor, shallow breathing, slow and weak pulse are usually present.

1. Keep lying down until fully recovered.

F-06238

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MEDICAL DIRECTIVES AND NURSING PROCEDURES

Emergency Situations

2. Loosen clothing.

3. Use ammonia inhalants.

If other signs are present or if unconsciousness persist longer than a few minutes, call a physician.

Do not leave patient unattended.

Open airway.

Give nothing by mouth to an unconscious patient.

E-06239

ETC 00176

Witnessed Cardiac ArrestHave Ethyl Physician notified

1. Open airway.
2. Check for carotid pulse.
3. Deliver a blow to mid sternum (within first 30 seconds).
4. Ventilate four times by mouth - to - mouth technique.
5. Recheck for pulse, if still absent, begin external cardiac compression at 60/minutes with two ventilations after each 15 compressions.
If two people use 1 to 5 rate.
6. Continue resuscitation without interruption
7. Transport to nearest hospital as fast as possible in Company ambulance.

DATASCOPE DEFIBRILLATOR

TO BE USED BY PHYSICIANS ONLY!

MEDICAL DIRECTIVES AND NURSING PROCEDURES

Acute Abdominal Injuries

Trauma to the external abdominal wall may result in injury to underlying organs, even with little evidence of damage. Until seen by a physician, obviously severe or suspected internal abdominal injuries should be cared for as follows:

External Abdominal Injury

1. Keep employee flat and quiet.
2. Control bleeding and cover open wounds.
3. If internal organs are exposed, cover with sterile moist bandage to avoid contamination.
4. Do not remove penetrating object.
5. Give nothing by mouth.
6. Treat for shock and avoid unnecessary handling.
7. Contact the plant physician-if cannot contact, then any appropriate physician listed on consultant's list.
8. Arrange for emergency transportation.

Possible Internal Abdominal Injury

1. Keep employee flat and quiet.
2. Give nothing by mouth.
3. Treat for shock and avoid unnecessary handling.
4. Contact the Plant Physician. If cannot contact, then any appropriate physician listed on consultant's list.
5. Arrange for emergency transportation.

Additional Medical Directives and/or Specific Medications

F-100-241

MEDICAL DIRECTIVES AND NURSING PROCEDURES

Severe Chest Pain

1. Absolute rest in a position of comfort.
2. Place in Emergency surgery room.
3. Check pulse, blood pressure and respiration.
4. Make EKG.
5. Connect heart monitor.
6. Have Plant physician see patient.
7. Start Oxygen.
8. Notify personal physician.
9. Arrange for ambulance.

Sprains and Strains of Extremities

1. Obtain accurate history and record.
2. Elevate and apply Ice cap for 30 minutes.
3. Have physician see patient.
4. If x-ray needed (Dr. order only) notify technician.
5. Apply ace wrap.
6. Give Aspirin tabs (dispense 8) signify two every four hrs. as needed for pain.

Strain in Groin

If occupational in origin:

1. Obtain an accurate and detailed history and record on Medical Treatment Report.
2. Have physician see patient.

Non-occupational in origin:

1. Advise patient to see his personal physician.

Hives

1. Give Benadryl 25mg. caps (dispense 3) signify one t.i.d.
2. See private physician if symptoms persist or reoccur.
3. Warn patient of sedative side effect of medication.

Immediate Care of Major Burns

1. Remove clothing quickly.
2. Cover with burn sheet.
3. DO NOT IMMERSE OR APPLY ICE WATER OVER BURN. COLD MAY INTENSIFY SHOCK.
4. Maintain airway and administer oxygen.
5. Nothing by mouth.
6. Notify the Burn Unit at the Baton Rouge General Hospital prior to transfer. Phone number 387-7717.

Burns

Record type, degree and extent (Use "Rule of Nines")

1. Immerse in cool water (50-60° F.) until pain ceases.
2. With sterile thumb forceps removed dead tissue from the burn surface.
3. Clean thoroughly with soap and water, pat dry with sterile gauze.
4. Shave surrounding area if indicated.
5. Apply Silvadene , adaptic and sterile dressing.
6. Advise to keep wound dry and to report daily for dressing change.

Additional Medical Directives and/or Specific Medications.

Have physician see patient on all electrical burns, all third degree burns and all burns if large % of the body surface involved. On shift, notify Plant Physician.

Record evaluation of wound healing daily.

Notify plant physician if wound appears infected.

Eschar will be debrided by the plant physician.

Evaluating Wound Healing

Such evaluation depends on the answers to the following questions:

SIZE _____ Is the wound diminishing? Enlarging?
Healing peripherally?

DEPTH _____ Is it flat? Indurated?

ODOR _____ Is there a necrotic odor?

Exudate _____ Is it purulent? Thin? Viscid?

APPEARANCE _____ Is the wound clean? Epithelizing? Crusting?

MEDICAL DIRECTIVES AND NURSING PROCEDURES

Lacerations

1. Scrub the wound thoroughly with soap and water and shave area if necessary.
2. Clean and dry wound and surrounding area with alcohol.
3. Apply Tincture Phemeral and sterile dressing.

Additional Medical Directives and/or Specific Medication.

1. If laceration is deep, have doctor see patient.
2. If excessive bleeding, apply sterile pressure dressing and have doctor see patient.
3. Some lacerations may be closed with Steri-Strip skin closures.

Fractures

1. Treat for shock and avoid unnecessary handling.
2. Immobilize part.
3. Have physician see patient
4. ~~_____~~
5. Arrange for transportation.

indigestion

1. ~~Di-Gel tablets signify 1 or 2 tablets, chew as needed (dispense 8)~~

~~Additional Medications and/or Specific Medications~~

1. Creamalin tablets signify 2 tablets - chew or swallow with water as needed (dispense 8)
2. Citrocarbonate 1 - 2 teaspoons. Stir in glass of water, take while foaming.

MEDICAL DIRECTIVES AND NURSING PROCEDURES

Insect Bites or Stings

1. Use Sting - Kill swab
Crush swab and immediately apply solution to affected area. Rub in with finger.
2. Apply cold compresses 20 minutes.
3. Give Chlortrimeton 4 mg. one tablet.
4. In case of acute reaction
 - a. Non-occupational - call personal physician immediately.
 - b. Occupational - call plant physician immediately.

Chafing, "Jockey itch", Prickly Heat

1. Instruct to clean and dry affected area.
2. Apply Caldesene powder, Desenex powder, or Vaseline Petroleum Jelly to affected areas twice daily.

Sunburn

1. Dermaplast spray - one time to affected area.
2. Refer to personal physician for further treatment.

Additional Directives

-]. Nupercainal ointment to affected area.

Poison Ivy or Oak

1. Caladryl lotion- apply to the affected area three or four times daily.
2. Advise to consult personal physician if condition persists.

MEDICAL DIRECTIVES AND NURSING PROCEDURES

Dysmenorrhea

1. Take a history with emphasis on frequency, duration, associated symptoms, medication used.
2. Give the patient a mild analgesic.
3. If cramps are severe, have the employee lie down with heat to the abdomen.
4. If the patient is not able to return to work in 30 minutes, she should be sent home.
5. Refer to private physician for any further treatment.

Headache

1. Take history. If accompanied by dizziness, nausea, vomiting, stiff neck, history of recurrence, general malaise or other symptoms, advise to see personal physician. Be alert that headache may be caused by exposure to toxic substances on the job.
2. If no other symptoms other than simple headache, give two Aspirin, Bufferin, or APC tablets.
3. If severe and past history indicates ASA ineffective, give Darvon-65 tablets, one p.o. stat only.
4. If allergic to Aspirin - give tylenol tablets $\bar{11}$.

Respiratory Irritation or Infection

1. Take history, temperature and pulse.
2. If condition, as far as nurse can determine, is mild, the following medications may be given:
 - a. Common cold symptoms: Cold tabs #1 sig 1 t.i.d. (dispense 12) or Dasin Capsules two stat, then one every 3 - 4 hours (dispense 8).
 - b. Cough: Quatussin-Cough Syrup one teaspoon every 3 - 4 hours as needed (dispense 2 oz.).
 - c. Sore throat: Cepacol Lozenges (dispense 1 - 2 packages) or Chloraseptic spray (stat dose in Medical).
3. Counsel employee regarding rest, diet and fluids.
4. If temperature is over 100° F., send patient home and advise to contact his private physician.

MEDICAL DIRECTIVES AND NURSING PROCEDURES

Bite Wounds

Animal Bites

1. Scrub the wound thoroughly with soap and water.
2. Rinse thoroughly with running water.
3. Sterile Dressing.
4. Determine tetanus immunization status.
5. Refer to private physician.

Boils and Local Skin Infections

1. Check temperature. Note history of duration of infection.
2. If of minor nature:
 - a. Apply hot soaks of epsom salts for twenty minutes b.i.d.
 - b. If draining, ~~Triple antibiotic ointment~~, dressing.
3. Any infection near a joint and above the neck should be referred to private physician.
Also if lesion is large or seems to be spreading or if several lesions are present or lesions appear frequently, should be referred to private physician.
4. Do Not squeeze or open lesion.
5. Protect your own hands from direct contact with the lesion or the exudate contained therein.

Diarrhea

1. Take history, temperature, and pulse.
2. If employee has a fever of 100° or over or a history of abdominal pain, refer him to personal physician.
3. If there is no elevation in temperature, give 30 cc. of Parepectalin.
4. Advise the patient to eat a bland diet and to eliminate coffee.

Additional Medical Directives and/or Medications

1. Quiagel 30 cc. initially, repeat 1 - 2 tablespoons after each loose bowel movement.

MEDICAL DIRECTIVES AND NURSING PROCEDURES

Dry Skin

1. Nivea cream, apply small amount 2 or 3 times daily.
Dispense small amount in round tin.

Fever Blisters (Herpes Simplex)

1. Apply tincture of Benzoin with cotton applicator - do no dispense.

Additional Medical Directives and/or Medications

1. Apply ~~Triple antibiotic oint.~~ - dispense small amount in round tin and instruct to apply several times a day.
2. If blisters increase, persist, or reoccur frequently, advise to consult with personal physician.

Sore Throat

1. Take temperature, if has fever and/or if exudate in posterior pharynx or on tonsils, refer to his personal physician.
2. When complaints do not indicate need for immediate medical attention:
 - a. Give Cepacol lozenges, dispense 1-2 packages.
 - b. Aspirin, gr X

Sinus or Stopped-up Nose

1. Privine Nasal Spray (stat dose in Medical).
2. Give Allerfrin tablets, one t.i.d. (dispense 6 tablets).

Influenza

Complaints of generalized malaise, muscular aching, sore throat, if temperature is over 100 degrees F.:

1. Send home.
2. Refer to his personal physician.

If temperature is less than 100 degrees:

1. Give Cold Tabs #1 sig (1) t.i.d. (dispense 12)

Earache

If eardrum is not perforated:

1. Instill warm Auralgan drops, plug loosely with cotton.
2. Advise patient to see his personal physician.
3. Do not issue drops to take out.

E-06248

ETC 00185

MEDICAL DIRECTIVES AND NURSING PROCEDURES

Ear Wax

Do not irrigate if there is any evidence of infection or if known perforation in eardrum. Advise patient to consult his private physician for this procedure.

If neither abnormality present:

- 1.) Lavage with warm water, directing stream to side of canal, if pain is experienced or if wax will not come out, advise patient to consult his personal physician for removal.

Furuncle in Ear Canal

Advise patient to see his personal physician.

Nausea and Vomiting

- 1) Give Emetrol, 30 cc. This may be repeated in 15 minutes, if needed. Never dilute Emetrol and instruct patient not to drink fluids immediately before or after taking a dose.

Athletes Foot

- 1) Wash and dry infected areas morning and evening.
- 2) Give Desenex Powder and ointment.
 - a) Dust powder liberally every day rubbing powder gently on the skin.
 - b) Apply ointment to affected areas every night before retiring.

Additional Medical Directives and/or Specific Medications

- 1) Lavender lotion - apply one time daily - dispense one oz.
- 2) If condition does not improve or if it becomes worse, discontinue use and consult personal physician.

Hemorrhoids

- 1) Give one tube of Nupercainal ointment. Instruct not more than one tube should be applied in 24 hours and not for prolong use.
- 2) Advise hot sitz bath at home.
- 3) Instruct to consult personal physician if symptoms increase, persist, or reoccur frequently.

F-06249

ETC 00186

MEDICAL DIRECTIVES AND NURSING PROCEDURES

Conjunctivitis

1. Murine drops for "tired eyes" - squeeze two or more drops into each eye.
2. Bleph - 10 - if photophobia or exudate present, 1 or 2 drops into lower conjunctival sac every 2 to 3 hr. during the day for one day only.
3. Advise to see personal physician if symptoms persist.

Arc Burn of Eyes

Latent period between burn and onset of symptoms.

1. Pontocaine drops - one time only (explain depresses healing process).
2. Cold compresses.
3. Neodecadron drops every 2 hrs. during the day for one day only.
4. Aspirin tabs two for pain.

Additional Medical Directives and/or Specific Medications

1. Bleph 10 - one or two drops every 2 hours during the day for one day only.

Chemical Irritations and Burns of Eye

1. Pontocaine drops one or two.
2. Irrigate 10 - 15 minutes with Saline solution if mild.
3. For severe burn irrigate 30 minutes.
4. Get visual acuity test.
5. Stain with Fluor-I-Strip.
6. Have physician see patient.

Eye Abrasions

1. Get vision acuity test.
2. Pontocaine drops one or two.
3. Have physician see patient.

Sudden Loss of Vision (Possible occlusion of vessel)

1. Get vision acuity test
2. Take accurate history and record
3. Have physician see patient.

E-06250

ETC 00187

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MEDICAL DIRECTIVES AND NURSING PROCEDURES

Hordeolum (sty)

1. Hot compresses, 20 minutes q.i.d.
2. Bleph 10-signify one or two drops ever 3 hours during day.

Blisters on Eyelids (cause unknown)

1. Break blister with applicator.

Blunt Trauma to Eye

1. Keep patient still and quiet.
2. Refer immediately to ophthalmologist.

Chalzions (Granuloma of internal sebaceous glands of internal eyelid)

1. If inflamed-hot compresses, 20 minutes four times a day.
2. Advise patient to contact ophthalmologist.

Spontaneous Subconjunctival Hemorrhage

No treatment necessary

Foreign Body of the EYE

1. Pontocaine drops one or two (if involuntary spasm of the patients eyelids makes examination difficult).
2. Both lids are everted and the entire conjunctiva and cornea are inspected with a binocular loupe.
3. Conjunctival or corneal FB's are flushed out with a stream of Dacriose Solution or wiped out with a sterile cotton applicator moistened with Dacriose Solution.
4. Following removal of the object, irrigate conjunctival sac with Dacriose.
5. If no FB is noted, stain eye with Fluor-I-Strip, wash excess out with Dacriose Solution, abrasions will stain green.
6. Do not attempt to remove an embedded corneal FB, have physician see patient.
7. If rust ring remains after removal of a corneal FB, have the physician see the patient.
8. Refer to patient's personal physician if embedded FB is not occupational in origin.
9. Make Medical Treatment Report if alleged and no FB found, put on Daily Breakdown as new injury. Issue Safety and Foreman's copies as for all new injuries.
10. DO NOT USE EYE SPUD.

Friction Blisters

- A. Alleged to be occupational
 1. Obtain an accurate history, record on the Medical Treatment report and make "Pending"
 2. If infection is present, have physician see the patient.
 3. Cleanse with soap and water.
 4. Apply tincture benzoin and sterile dressing.
 5. If blister is broken, apply triple antibiotic ointment and sterile dressing.
- B. Non-occupational
 1. Treat as above.
 2. Advise to consult personal physician if appears to be infected.

E-06252

ETC 00189

MEDICAL DIRECTIVES AND NURSING PROCEDURES

Toothache

1. Give Aspirin or Darvon Compound tablets two stat.
2. If caused by cavity, apply oil of cloves to cavity with piece of cotton.
3. Refer to personal physician for any further treatment.

Nose Bleed - Epistaxis

1. Have patient pinch nose firmly for 5 minutes, by the clock.
2. If bleeding persists, refer to personal physician.

Back Injuries and Back Complaints

Back injuries or complaints may not be occupational in origin.

If non-occupational, refer to personal physician for any substantial complaints. When a plant physician is not in, make all alleged injuries "Pending".

Alleged Occupational Injuries

A. When plant physician is in:

1. Obtain an accurate and detailed history.
(As much as possible of the data should be recorded in the employee's own words.)
2. Put employee in exam room and have him undress.
3. Notify the doctor.

Asthma

Usually the employee will identify himself as an asthmatic.

1. Do not treat.
2. Excuse P.I. to see personal physician.
3. If in immediate distress:
 - a. Notify plant physician.
 - b. Call his physician.
 - c. Transport to hospital emergency room.

E-06253

ETC 00190

ON ALL ALLEGED ILLNESSES SAID BY PATIENT TO BE RELATED TO HEAT ON JOB, ISSUE INJURY SLIP. IF NOT SEEN BY A PHYSICIAN, SLIP TO READ "POSSIBLE HEAT CRAMPS" OR "POSSIBLE HEAT EXHAUSTION."

Heat Exhaustion

Symptoms of heat exhaustion are cramps of abdomen or skeletal muscles, profuse perspiration, weakness, headache, dizziness, rapid heart rate, nausea and vomiting, and no significant elevation of body temperature.

1. Rest in ward.
2. Check ORAL TEMPERATURE , pulse, respiration and blood pressure.
3. One glass of Gatorade to sip slowly.

Additional Medical Directives and/or Medications:

1. Give sips of cool salty water (one teaspoon to a glass of water).

Heat Stroke

Medical emergency requiring immediate recognition and vigorous treatment. Symptoms are markedly elevated temperature (usually 105-106), the skin is dry, pulse very rapid and shallow with hypotension, and rapid respiration. May exhibit either a deep coma or seizures. Diarrhea and vomiting may occur.

1. Check RECTAL temperature, pulse, respiration, blood pressure.
2. Restore normo thermia (ice caps, alcohol sponge of body).
3. Administer oxygen.
4. Transfer to hospital emergency room as soon as possible.

Heat Cramps

Characterized by spasm of voluntary muscles. The spasm can be painful and usually involves the extremities and the abdomen.

1. Check oral temperature, pulse, respiration, blood pressure.
2. Oral administration of 1 glass of Gatorade to sip slowly.
3. Rest in ward.

Head Injuries

1. Stop bleeding
2. Have rest in bed with ice cap to head 30 minutes
3. Take blood pressure, pulse, and respiration
4. Record neurological observations
 - a. Level of consciousness
 - b. Pupillary reaction
5. Have physician see patient if indicated.

Abrasions

1. Clean thoroughly with Betadine surgical scrub.
2. Apply Triple Antibiotic Ointment and sterile dressing.

Tar Burns

1. Remove tar with mineral oil or degreaser. Cold soak until pain subsides.
2. Clean with soap and water.
3. Apply Triple antibiotic ointment, adaptic, and sterile dressing.

Alloy Burn (lead-sodium alloy)

1. Wash thoroughly with soap and water.
2. Apply Triple antibiotic ointment and sterile dressing.

Aluminum Alkyl Burns

These compounds burn on contact with air, so they cause burns when they contact skin. Although these burns are almost always shallow, they are immediately painful and often the burned skin will turn white. These burns are never as bad as they first appear to be.

1. Wash with soap and water.
2. Apply cold water compresses until pain ceases.
3. Silvadene, adaptic and sterile dressing.

E-06255

ETC 00192

Permanganate Burn

Permanganate solutions used on this plant usually cause very shallow burns and may only leave a brownish stain.

1. Wash with soap and water.
2. Apply Nivea cream
3. Tell patient stain will wear off in time.

Sodium Burn

Sodium burns when it contacts water and causes deep burns when it contacts the skin.

1. Remove any sodium from wound with forcep
2. Wash thoroughly with soap and water.
3. Apply cold compresses until pain ceases.
4. ~~Neosporin~~ ^{SILVADENE}, adaptic, and sterile dressing.

Sulfuric Acid (Battery Acid, Oil of Vitriol)

Immediate and thorough washing with lots of water and soap. Sulfuric acid causes a chemical burn which (after thorough washing) is treated like any other burn.

Procedure for Suturing

1. Have doctor see patient to determine if suturing necessary.
2. Shave skin.
3. Clean wound thoroughly with Betadine Surgical Scrub, rinse off with water and dry with sterile gauze.
4. Put Barrier drape on Mayo stand, empty onto stand with sterile technique, wound closure instrument tray, eye towel, pack of sterile 3 x 3 sponges, and suture of operator's choice.
5. Set sterile gloves ~~out~~ out for operator.
6. Have Xylocaine and syringe with needle out for operator.
7. Do not leave room during suturing unless so directed by physician.
8. Put dressing on according to operator's directions. Instruct to keep dry.
9. Have patient report following day for examination of repaired wound by physician.

E-06257

ETC 00194

MEDICAL DIRECTIVES AND NURSING PROCEDURESPossible Alcohol Intoxication

If presented with an employee who is supposedly under the influence of alcohol, function only as an observer.

1. Record your observations of the actions of the employee and how he responds in ordinary conversation.
2. Do not interpret your observations.
3. Do not state an opinion as to whether the individual is "drunk" or under the influence of alcohol.
4. Employee's supervisor is to determine whether or not the employee can do his work satisfactorily.
5. Do not excuse personal illness, this is a disciplinary problem to be handled by employee's supervisor.
6. If to be sent home by supervisor, and you feel employee is unable to take himself home safely, advise the supervisor to arrange for transportation.
7. Do not draw a blood sample unless specifically ordered by Ethyl physician.
8. If Ethyl physician orders blood sample, have patient sign permission request form.
9. Notify Ethyl physician of all such incidents.

INSTRUCTIONS FOR COLLECTING BLOOD FOR ALCOHOL

1. Disposable syringes and needles and grey-topped vacuum test tubes for collecting blood are on the 2nd shelf from top of sterile linen cabinet.
2. Before collecting blood rub site to be punctured with ether (do not use alcohol sponge) and let dry before touching needle to skin.
3. Draw 10 cc. of blood.
4. Insert needle through grey rubber stopper of test tube and allow vacuum in tube to pull blood from syringe. Do not allow air into tube by removing the stopper before or after filling tube with blood.
5. Immediately mix blood with powder in tube by inverting test tube at least 10 times. Do not remove stopper.
6. On slip of paper write name, badge number, date and time. Wrap slip around blood tube and wrap rubber band around tightly to secure label.
7. Put test tube in standing position in wooden block.
8. Put blood in your refrigerator and leave note for Laboratory that blood was collected for test.

F-06259

ETC 00196

Date: _____

I hereby request and give permission for blood to be drawn so that a blood alcohol determination may be made on my blood. I fully understand this test is capable of indicating whether I am under the influence of alcohol. I further agree in giving my permission that the result and the interpretation of the result will be given both to me and to my supervision.

WITNESS:

Ethyl Corporation
Corporate Medical Department
Baton Rouge, Louisiana

Medical Directive Number: 05-001

Subject: Emergency Cardiac Care

Issued: December 1, 1977

Applies to:

Effective: December 1, 1977

- ☒ Corporate Activities
- ☒ Domestic Field Sites
- ☒ Domestic Affiliates
- ☐ International

PURPOSE AND PROCEDURE

To assist in the care of patients with cardiac emergencies. Site Physicians will be responsible for the procedure in their clinics. Sites without monitor-defibrillators will be limited to basic life support and drugs approved by the Site Physician.

Note: This directive is not intended to be a complete treatise on the subject, but is to serve as an aid to help us with our forgetfulness and difficulty remembering details we will rarely use.

CONTENTS

- . Introduction and explanation of emergency cardiac care applicable to Ethyl Clinics.
- . Emergency Cardiac Care by the Nurse.
- . Emergency Cardiac Care by the Physician.
- . Life Support Summary.
- . Major Drugs Summary.
- . Samples of Arrhythmias.
- . JAMA Standards for CPR as a reference book.
- . Emergency Cardiac Care (under separ. cover) for Site Medical Departments

E-06261

ETC 00198

EMERGENCY CARDIAC CARE
CORPORATE MEDICAL DEPARTMENT
ETHYL CORPORATION

INTRODUCTION

About one million persons in the United States experience acute myocardial infarction each year. More than 650,000 die annually from ischemic heart disease. About 350,000 of these deaths occur outside the hospital, usually within two hours after the onset of symptoms. A proportionate number of Ethyl employees will have a heart attack on the job. It is our job to prevent sudden death from heart attack where possible by prompt appropriate treatment.

Emergency cardiac care includes:

1. Recognizing early warning signs of heart attacks, preventing complications, reassuring and stabilizing the victim, and moving him to a hospital without delay.
2. Providing immediate basic life support at the scene, as needed.
3. Providing advanced life support as quickly as possible, as needed.
4. Transferring the stabilized victim to a continued cardiac care facility.

Emergency transportation alone, without life support, does not constitute emergency cardiac care. The victim must be stabilized at the scene and maintained during transportation to the site of continuing care. The degree of treatment is determined by the patient's clinical state and may range from simple reassurance to cardiac defibrillation.

LIFE SUPPORT

Basic Life Support

Basic life support is an emergency first aid procedure that incorporates the ability to recognize respiratory and cardiac arrest and to apply adequate cardiopulmonary resuscitation. Basic life support must be instituted within seconds to prevent biologic death.

Advanced Life Support

Advanced life support includes basic life support plus cardiac monitoring, intravenous infusions, use of airway adjuncts, drug administration, defibrillation, and establishment of such postresuscitative care as is deemed necessary. Advanced life support requires medical direction and adequate facilities.

ETC 00199

F-06262

SUDDEN DEATH

Sudden death occurs abruptly and unexpectedly. There are two stages:

1. **Clinical death:** The cells of the brain metabolize aerobically. Should delivery of oxygen to the brain cease, as in absence of effective ventilation or circulation, the brain cells are irreversibly damaged within 4 to 6 minutes in the adult. (The brain cells of infants and children are more resilient and may remain viable as long as 8 to 10 minutes in the absence of oxygen.) This 4 to 6 minute period after cessation of effective ventilation and circulation is referred to as clinical death. The individual appears dead, yet reversal of all morbid symptoms is possible, since brain cells can remain viable if delivery of oxygen is reinstituted.
2. **Biological death:** The second stage of death is irreversible and exists when such changes have taken place in the brain cells that their function cannot return. Other tissues in the body, such as heart, lungs, liver, and kidneys can metabolize anaerobically for 15 to 20 minutes after biologic death has occurred. With resuscitative efforts the heart and respiratory functions may return but not conscious, voluntary cerebral function. Following biologic death, the victim may survive for many days or months without hope of recovery.

The physiology of sudden death and its treatment may be better understood by considering the sequela to ventilatory and circulatory failure.

Failure of Ventilation

When respirations cease, there is no exchange of gases between the lungs and the bloodstream. Carbon dioxide accumulates producing respiratory acidosis; oxygen is not supplied, the tissues become hypoxic, anaerobic metabolism commences, and lactic acidosis results.

Response to this loss of vital function is immediate. There is strong activation of the nervous system resulting in restlessness, increased pulse and respiration, and peripheral vascular constriction - all aimed at preserving the oxygen supply to the brain. When affected by hypoxia and acidosis, the heart is unable to function normally, resulting in arrhythmias, which reduce effective blood circulation. Initially, arrhythmias may simply impair the pumping action of the heart, but if these persist or are severe enough, they can cause total cessation of cardiac action. Thus the ultimate result of cessation of oxygen interchange in respiratory or ventilatory arrest is cardiac arrest.

Circulatory Failure

Cessation of effective pumping action of the heart prevents adequate perfusion of the tissues since cardiac output is reduced. If there is disruption of the heart's rhythmical, electrical activity (which precedes mechanical contraction) and a severe arrhythmia ensues, effective pumping action of the heart will be impaired or may cease entirely, resulting in cardiac arrest.

ETC 00200

MECHANISMS OF CARDIAC ARREST

Ventricular Standstill

In ventricular standstill there is no electrical activity and, hence, no mechanical contraction. This is seen on an EKG by the absence of all but a straight, undisturbed line.

Ventricular Fibrillation

In ventricular fibrillation the depolarization, or electrical activity, in the ventricle is totally disorganized so that different areas of the ventricular myocardium are depolarized at different times. Therefore, the mechanical ability is disturbed and contractions of the heart cannot occur.

MANAGEMENT OF ARREST

It is essential that the initial diagnosis of cessation of vital function be made promptly. An estimated 4 to 6 minutes are available before biologic death occurs. It is necessary, therefore, in adults, to institute resuscitative measures within 3 to 4 minutes; otherwise, effective restoration to responsible life may not be possible.

Diagnosis

Respiratory inadequacy may be caused by obstruction of the airway or respiratory failure. An obstructed airway can be recognized by noisy, labored breathing and excessive respiratory efforts. Respiratory failure is characterized by minimal or absent respiratory effort, failure of the chest to move, and inability to detect air movement through nose or mouth. If only breathing is inadequate or absent, rescue breathing may be all that is necessary to restore the patient.

Opening the airway and restoring breathing are the basic steps of artificial ventilation and should be applied initially in emergency resuscitation.

Airway

The first step in successful resuscitation is to open the airway. This is done easily and quickly by hyperextending the head as far as possible. The person is positioned on his/her back and the rescuer places one hand under the neck and the other on the person's forehead. The rescuer then lifts the neck and tilts the head backward. This hyperextension of the neck lifts the tongue away from the back of the throat, thus relieving this anatomic obstruction. The head should be maintained in this position at all times. Should there be obvious foreign material in the throat, remove this immediately with the fingers or suction. The first ventilatory effort will determine whether or not further obstruction exists. If maximum extension of the head fails to adequately open the airway, forward displacement of the jaw may achieve the necessary patency.

ETC 00201

Breathing

If after opening the airway the person does not resume spontaneous breathing, begin artificial ventilation by mouth-to-mouth or mouth-to-nose resuscitation.

Mouth-to-mouth resuscitation. Mouth-to-mouth artificial ventilation is an effective means of providing needed oxygen. The body only extracts about a quarter of the oxygen inhaled from the ambient air, which leaves about 16% oxygen content in exhaled air. When performing artificial ventilation, the rescuer takes a deep breath and may provide the victim with as much as 18% oxygen. This concentration of oxygen is entirely adequate. Make no attempt to remove firmly fitting dentures; they will help to provide an airtight seal. If dentures are loose, remove them.

After achieving an airway with exaggerated neck extension, take a deep breath, make an airtight seal by pinching the victim's nose, place your mouth closely over the victim's mouth, and exhale deeply and quickly. If desired, a thin layer of gauze or a handkerchief may be used to cover the victim's mouth; this will not interfere with the oxygen input. Initially, give four deep breaths. In between breaths remove your mouth and allow the victim to exhale passively. After the initial four breaths, give one ventilation every 5 seconds - approximately 12 times per minute - until spontaneous breathing resumes.

Adequate ventilation is ensured by seeing the chest rise and fall, noting the resistance of the lungs as they expand, and hearing or feeling air escape during exhalation.

Stomach distension. Rescue breathing can cause stomach distension. This is frequently seen in children, but is not unusual in adults. It occurs most often when excessive pressures are used for inflation or if the airway is obstructed. Stomach distension can be dangerous because it may (1) reduce lung volume by elevating the diaphragm, (2) promote regurgitation, and (3) cause vagal tone which may result in bradyarrhythmias after resuscitation. Firm but gentle pressure should be instituted over the epigastrium with the patient's head turned to the side.

Circulation

Having established an airway and delivered four breaths, the next approach is to check circulation and heart action. This can be done by palpating for the carotid pulse. With the tips of the index and middle fingers of one hand, gently locate the patient's trachea and slide your fingers laterally into the groove between the trachea and the muscles at the side of the neck. If present, the carotid will be felt. The pulse area should be "felt" rather than compressed.

The carotid is the pulse to be checked for several reasons. The peripheral circulation may not be adequate to produce a radial pulse; the femoral pulse is inaccessible except in the hospital situations since the person is usually dressed. The neck area of the carotid pulse is immediately accessible. The carotids are the first arteries to arise from the aorta and, therefore, they are more central and frequently will persist when other pulses are no longer palpable. The absence or questionable presence of a carotid pulse is an indication for starting external cardiac compression.

Precordial thump. This maneuver is recommended only when the arrest is witnessed. It is not recommended for children.

A single, quick precordial thump is delivered by raising the fist 6 to 10 inches and delivering a blow to the midsternum. This may restore an effective rhythm in cases of heart block, ventricular tachycardia, or ventricular fibrillation of recent onset; i.e., within the first 30 to 60 seconds of cardiac arrest.

In the resuscitative procedure the time of delivery of the thump varies. In the monitored patient, it is the initial maneuver of life support; that is, it is delivered immediately when arrest is diagnosed. In the witnessed arrest of an unmonitored patient, an airway is established, breathing commenced, absence of pulse determined, and then the precordial thump is delivered.

No time should be lost assessing the effect of the precordial thump or in delivering repeated thumps. One is all that is recommended.

External cardiac compression. External cardiac compression must always be accompanied by artificial ventilation. For external compression to be effective, the patient must be on a firm surface. The aim is to depress the sternum 1 1/2 to 2 inches so that the heart is compressed between the sternum and the spine. If the patient is in a bed, a wide board should be inserted under the chest, but compression should not be delayed while waiting for such a board.

Position yourself to one side of the patient in close contact. Place the long axis of the heel of one hand parallel to and over the long axis of the lower half of the sternum. Great care must be taken not to place the hand over the tip of the sternum. Place the other hand on top of the first with the fingers interlaced. Then moving forward so that the shoulders are directly above the patient's sternum and keeping your arms straight, exert pressure almost vertically downward to move the lower sternum 1 1/2 to 2 inches in the adult. The compressions should be regular, smooth, and uninterrupted, with the moments of relaxation and compression being of equal duration. The hands should not be lifted from the chest during relaxation.

The present preferred compression rate is 60 per minute, which maintains blood flow and allows cardiac refill. With two rescuers, breaths should be interposed every 5 seconds without any interruption of the rhythm of compression. The ratio is five compressions to one breath.

Nothing should interrupt external cardiac compression for longer than 5 seconds with two exceptions: (1) Endotracheal intubation should never require interruptions of longer than 15 seconds. (2) Interruptions of up to 15 seconds may be absolutely necessary when transporting the patient.

A single rescuer must perform both artificial ventilation and compression using a 15 to 2 ratio. This consists of two very quick lung inflations after every fifteen compressions. Because of these interruptions to ventilate the patient, the rescuer must compress at a faster rate - at least 80 compressions per minute - to achieve the actual compression rate of 60 per minute.

Pupils. Pupils should be checked every 5 minutes during cardiopulmonary resuscitation, since they can indicate that oxygenated blood is reaching the patient's brain. Change in pupil size indicates adequate oxygenation. If pupils remain fixed, either constricted or dilated (do not react to light), serious brain damage may have occurred or may be imminent. Ingestion or topical use of drugs or age can change normal pupillary reaction, for example, morphine can cause constriction, and atropine dilation, of the pupils.

Checking pulses. The carotid pulse should be palpated periodically during compression to check effectiveness of compression. A pulse should be felt with each compression. Compression should be stopped very briefly after one minute to ascertain if spontaneous effective heartbeat has returned. This should be checked every 5 minutes after commencing compression.

Complications. Complications can occur from improperly performed external cardiac compression. Even with correct technique, it is inevitable that rib fractures will occur in some patients. Other complications include fracture of the sternum, pneumothorax, hemothorax, lung contusions, laceration of the liver, and fat emboli. However, complications can be minimized by careful observance of correct technique. Remember:

1. Never interrupt external cardiac compression for longer than 5 seconds, except for endotracheal insertion and transportation.
2. Never compress over the xiphoid process, since this can cause laceration of the liver.
3. The heel of the hand should remain in constant contact with the lower half of the sternum, and the rescuer's fingers should never touch the patient's ribs when compressing.
4. Never use sudden or jerky movements to compress the chest.
5. Never compress the abdomen and chest simultaneously.

ETC 00204

A maximum sense of urgency should continue throughout the procedure. In arrest the most important aspect in diagnosis is time. Delay in commencing resuscitation is the single most disastrous factor. Arrest of vital function is an emergency with a time limit of approximately 3 minutes in which to commence resuscitation. Results are poor if the full 6 minutes have elapsed before beginning. Interruptions should be eliminated unless essential to resuscitation. This feeling of urgency should possess the rescuer until spontaneous breathing and a strong palpable pulse have been restored.

Basic life support should be continued until the patient recovers or can be transferred to a hospital or until the pupils have been fixed and dilated for 15 to 30 minutes and the victim has remained deeply unconscious with absence of spontaneous respiration and heartbeat.

ADVANCED LIFE SUPPORT

Action

It is essential that the defibrillator be available and in perfect working order. Personnel should be entirely familiar with the machine. They should check it weekly for function and be certain that the necessary adjunctive equipment is present.

If the patient arrests in the department and two rescuers are available, one establishes an airway and the other prepares to defibrillate immediately. The rationale: 75% of those who arrest are in ventricular fibrillation rather than standstill. The speed with which ventricular fibrillation is terminated has a distinct bearing upon the outcome. A prompt application of electrical shock to the fibrillating ventricle can return the patient to normal heartbeat within seconds, often precluding the need for any other cardiopulmonary resuscitative measures.

Defibrillation

Defibrillation is the treatment for ventricular fibrillation. When electrodes are correctly placed on the chest and the machine is activated, there is an instantaneous discharge of a dense field of current through the heart. This momentarily stops all electrical activity in the heart. One hopes that when it starts again, a more acceptable pacemaker will be in control. Most tachyarrhythmias are believed to be self-perpetuating; thus interruption of their action stops them.

ETC 00205

F-06268

Procedure:

1. The diagnosis is determined by - an unconscious patient without a palpable pulse or a picture of ventricular fibrillation on the monitor.
2. The machine should not be synchronized since there is no R wave. Hence, the synchronizer switch must be off; otherwise, there will be no delivery of current.
3. Defibrillation should be carried out within 30 seconds, if possible.
4. Upon diagnosis, turn on the machine and charge it to 400 watt-seconds while moving to the patient's side. Position the defibrillator comfortably close to the patient.
5. If electrode paste is used, prepare paddles by covering the face of them completely with a thin layer. It is not recommended to place paste on the chest since this can be messy or inadequate.
6. Dry the patient's chest to remove any perspiration.
7. The position of electrodes on the chest should be such that the heart is encompassed. The usual position for anterior paddles is just below the right clavicle to the right of the sternum and below the apex of the heart to the left of the mid-clavicular line.
8. A firm pressure on the paddles is used so that the skin is smoothed out, and skin burning and dissipation of electrical current avoided. Once correct position is achieved, pause a moment to see that all is as it should be.
9. "Everyone stand away." This instruction should be given by the person delivering the charge, who should also take care not to touch the patient.

Properly functioning equipment and a complete supply of drugs must be available. This must be checked frequently. The fundamentals of CPR must be thoroughly understood by all personnel. If the first "shock" does not convert the ventricular fibrillation, repeat twice; then go immediately to CPR. A frequent cause of failure to defibrillate, if the machinery is functioning, is acidosis.

ETC 00206

Cardiac Monitoring

The patient, if not already attached to a cardiac monitor, should have electrocardiographic monitoring established as soon as possible. The patient who arrests is particularly vulnerable to cardiac electrical instability for several hours following arrest. Personnel performing advanced life support should know arrhythmia recognition and treatment. It is important that lethal or potentially lethal arrhythmias be terminated quickly. The recognition and treatment of the early warning signs of such arrhythmias can prevent their occurrence.

Cardiac monitoring is so desirable in the arrested person that a monitor-defibrillator with EKG electrode-defibrillator paddles is recommended since, immediately upon contact with the chest, the paddles will detect the cardiac rhythm.

Intravenous Therapy

An intravenous route for administration of drugs should be established. This should be accomplished as soon as possible as a routine part of the procedure. The intravenous equipment should be firmly taped and capable of withstanding the other arrest procedures (e.g., defibrillation) and not become dislodged from the vein. Consequently, indwelling catheters are much preferred to needles for these infusions. The solution recommended is 5% dextrose and water, which is infused at a rate sufficient to keep the vein patent. All medications to be infused should be hung in tandem to this main line and controlled scrupulously.

Essential Drugs

Certain drugs are considered of critical importance. The essential drugs include: Oxygen, sodium bicarbonate, epinephrine, atropine sulfate, lidocaine, morphine sulfate, and calcium chloride.

Sodium bicarbonate. Metabolic acidosis is the first problem demanding correction, and sodium bicarbonate should be given first. In the presence of acidosis, the myocardium responds poorly to catecholamines. The early and regular administration of sodium bicarbonate can return the pH to normal and enable the myocardium to respond to the circulating and administered catecholamines. The recommended dosage 1 mEq/kg of sodium bicarbonate from syringes containing 50 ml of a 7.5% solution (44.6 mEq) should be given immediately. This should be repeated in 10 minutes if the patient remains unresponsive. (Example: The patient who weighs 70 kg will receive approximately 75 ml of the above solution initially and again in 10 minutes.) In another 10 minutes give half the initial dose if patient is still unresponsive.

Epinephrine. Although epinephrine can produce lethal ventricular arrhythmias, it has been shown to be effective in the following:

1. Enhancing ventricular fibrillation and thus effectiveness of defibrillation
2. Restoring electrical activity in standstill
3. Improving contractility in electromechanical dissociation

Epinephrine exerts a strongly positive inotropic effect on the heart, improves automaticity, and elevates perfusion pressure. Because of its dramatic effects, it should be handled with caution. A 1:1,000 solution (1 ml ampule) should be diluted to 1:10,000 by the addition of 9 to 10 ml of normal saline. Five milliliters of this solution should be given by direct intravenous injection every 5 minutes during resuscitation. The intracardiac approach is not recommended, it is fraught with danger and, even if efficiently accomplished, is of questionable value.

Atropine sulfate. One of the most valuable drugs available for treating slow rhythms or heart block, particularly when hypotension is present, is atropine. Slow rhythms are often caused by stimulation of the vagus nerve. Atropine blocks the action of the vagus nerve and acetylcholine at the cell level, thereby allowing greater sympathetic control and thus increasing the heart rate. A dose of 0.5 mg is given at 5 minute intervals to a total dose of 2 mg. If preferred, the entire 2 mg may be given initially. In cardiac arrest it is used to treat standstill and is given directly intravenously.

Lidocaine. Lidocaine is a valuable antiarrhythmic agent, which reduces the automaticity of the ventricle by increasing the stimulation threshold of the ventricle. Its effect is immediate and of short duration. When given in therapeutic doses, it neither affects myocardial contractility nor produces hypotension to the same extent as other antiarrhythmic drugs. But it can cause central nervous system irritability and convulsions and may cause hypotension in large doses. Lidocaine is particularly effective in controlling multifocal, premature, ventricular ectopic beats and ventricular tachycardia. It is of no value in standstill and should not be used. Because of its short duration, lidocaine is usually given intravenously as a bolus of 50 to 100 mg and may be repeated. This should be followed by intravenous infusion of up to 4 mg per minute while ventricular arrhythmias persist; this dosage is then reduced to 1 to 2 mg per minute for the 24 hours following arrest from ventricular fibrillation to prevent further ventricular irritability.

Morphine sulfate. Morphine is not indicated in the cardiopulmonary emergency, but is of the first magnitude in treating pulmonary edema. It is also important for patients with myocardial infarction for the relief of pain. Morphine reduces venous return by vasodilation and reduces anxiety and respiratory rate, all desirable in the patient with pulmonary edema.

Calcium chloride. Calcium increases myocardial contractility, prolongs systole, and increases ventricular automaticity. It is worth noting that sinus impulse formation can be suppressed and sudden death can occur in the fully digitalized patient following intravenous administration of calcium. In profound cardiovascular collapse and in standstill, it is useful. Calcium must not be administered together with sodium bicarbonate, since this mixture results in the precipitation of calcium carbonate. Large doses of calcium, when repeated, may produce dangerous blood levels. Recommended doses are 5 ml of 10% calcium chloride intravenously at 10 minute intervals during standstill in the non-digitalized patient. (Calcium gluconate 10 ml of 10% solution Q.10. min) may be substituted for calcium chloride).

Care must be taken that calcium does not extravasate since tissue sloughing will result.

Oxygen. Supplemental oxygen should be used as soon as available. Because of the intrapulmonary shunting and ventilation-perfusion abnormalities associated with low cardiac output, marked divergence occurs between alveolar and arterial oxygen tension; hypoxemia and thus metabolic acidosis ensue. These two conditions make resuscitation difficult, if not impossible.

When to Stop Life Support

Basic and advanced life support should be continued until the patient is restored to responsible life or until cerebral death is evidenced by:

1. Deep unconsciousness
2. Widely dilated and fixed pupils for a period of 15-30 minutes.
3. Absence of spontaneous ventilation
4. Myocardial death as evidenced by progressive widening and slowing of QRS complex

Life support should not be begun if it is known for certain that arrest has been present for more than 10 minutes (except in cases of drowning or in the very young).

ETC 00209

E-06272

Reference:

Sproul, C.W.; Mullanney, P.J.: Emergency Care Assessment and Intervention, St. Louis: C. V. Mosby Co., 1974, pp 315-331.

EMERGENCY CARDIAC CARE BY THE NURSE

Management of myocardial infarction by the nurse consists of:

1. Absolute rest in a position of comfort.
2. Blood pressure and pulse.
3. Electrocardiogram if there is someone present to interpret it.
4. Oxygen by mask or nasal catheter (8 liters per minute), as needed.
5. a) Morphine sulfate 15 mg (1 ml) I.M. or Demerol, 100 mg (2 ml) I.M. for pain.
b) Lidocaine I.M. 300 mg (3 ml) I.M. in deltoid for PVCs (premature ventricular contractions) more than six a minute, or in pairs.
c) Atropine sulfate 2 mg (4 ml) in deltoid for sinus bradycardia (pulse under 40).
d) Aramine 2-10 mg (0.2-1 cc) I.M. for maintaining diastolic 90-100 mm Hg.
6. Start I.V. with 5% dextrose in water if indicated.
7. Cardiopulmonary resuscitation.
8. Transportation to continued care facility.

BASIC LIFE SUPPORT

Basic Life Support consists of cardiopulmonary resuscitation (CPR) i.e. opening and maintaining a patent airway, providing artificial ventilation by means of rescue breathing, and providing artificial circulation by means of external cardiac compression.

Cardiopulmonary resuscitation is started as quickly as possible in the following order:

1. Immediately call for help. ETC 00210
2. Tilt the head to open the airway and simultaneously palpate the carotid pulse.

If the pulse is absent, give a precordial thump if indicated.

If the victim is not breathing, give four quick, full lung inflations.

If pulse and breathing are not immediately restored, begin CPR:

One rescuer: 15 chest compressions (at 80/min) to 2 lung inflations.

Two rescuers: 60 chest compressions (at 60/min) to 12 lung inflations.

3. The major emphasis of emergency cardiac care is life support through stabilization of the victim at the scene. Stabilization must be maintained during transport of the victim to the hospital.

Precordial Thump

It must be emphasized strongly that no time should be lost in waiting to assess the results of the precordial thump or to deliver repeated precordial thumps. Give only one precordial thump and begin CPR.

In delivering the precordial thump:

1. Deliver a sharp, quick single blow over the mid-portion of the sternum, hitting with the bottom, fleshy portion of the fist struck from 8 to 10 inches over the chest.
2. Deliver the thump within the first minute after cardiac arrest.
3. If there is not immediate response, begin basic life support at once.

EMERGENCY CARDIAC CARE BY THE PHYSICIAN

When a physician is in attendance, MI is treated as follows:

1. Absolute rest in a position of comfort.
2. Connect heart monitor.
3. Blood pressure, pulse, EKG.
4. Oxygen.
5. Start I.V. with 5% Dextrose in water.
6. For pain Morphine sulfate 3-4.5 mg I.V. Q.5-30 prn (15 mg/ml diluted to 5 ml = 3 mg/ml) or Demerol 100-200 mg I.M.

ARRHYTHMIAS

- I. PVC's (> 6/min or in pairs) give lidocaine (Xylocaine 2% or 20 mg/ml) 50-100 mg I.V. bolus slowly. May repeat in 3-5 min. if necessary. Begin drip 250 mg in 250 D5W (1 mg/ml at 1 to 4 mg/min or 15-60 mm/min)
- II. VENTRICULAR TACHYCARDIA (150-250) with good vital signs but in short bursts - handle as in PVC's.
- III. SINUS BRADYCARDIA (UNDER 40) Atropine sulfate 0.5 mg (1 ml of 1/120 gr/ml) I.V. bolus Q.5 min x 4 maximum until pulse = 60.
- IV. VENTRICULAR FIBRILLATION
 1. Life threatening act quickly.
 2. Signs: Unconscious, cyanotic, no pulse or respirations.

Monitor - fine or coarse (> 150 irregular) fibrillatory waves without identifiable QRS complexes.
 3. Precordial thump - once and hard.
 4. Defibrillation.

ETC 00212

E-06275

5. CPR

- a) Airway - clear and maintain
- b) Breathing mouth to mouth or ambu bag $\bar{c}$ O_2 (12/min)
- c) Circulation - Feel for carotid pulse if absent begin external cardiac massage (60 compressions/min)

Note: One rescuer 15 chest compressions at 80/min to 2 quick lung inflations

6. Drugs.

- a) I.V. infusion D5W.
- b) Epinephrine - Dilute 1 ml (1:1000) adrenalin to 10 cc (1:10,000). Give 5 ml I.V. bolus every 5 min during resuscitation.
- c) Sodium bicarbonate 75 ml of 7.5% solution I.V. bolus immediately after defibrillation. Repeat 75 ml bicarbonate bolus in 10 min if effective circulation not restored. Repeat 35 ml bolus in another 10 min if still unresponsive.
- d) Calcium chloride 2.5-5 ml of 10% solution I.V. bolus Q.10.min x 3 maximum. Do not administer simultaneously with bicarbonate because mixture gives precipitate.

Do not give to digitalized patients.

- e) Aramine (metaraminol) I.V. bolus 2-5 mg (0.2-0.5 ml) for hypotension followed by I.V. infusion 7.5-50 mg (0.75-5.0 ml) in 250 cc D5W. Maintain diastolic 90-100 mm Hg or 40 mm below usual pressure.

7. Stabilize and transfer to continued care facility.

V. CARDIAC STANDSTILL

- 1. Life threatening act quickly.
- 2. Signs: Unconscious, cyanotic, no pulse or respirations.

Monitor - No electrical activity. Straight undisturbed line.

- 3. Precordial thump - once and hard.
- 4. Defibrillation.

ETC 00213

5. CPR

- a) Airway - clear and maintain.
- b) Breathing mouth to mouth to ambu bag $\bar{c}$ O_2 (12/min).
- c) Circulation - Feel for carotid pulse if absent begin external cardiac massage (60 compressions/min).

Note: One rescuer 15 chest compressions at 80/min to 2 quick lung inflations.

6. Drugs

- a) I.V. infusion D5W.
- b) Atropine 2 mg (4 ml) I.V. bolus stat.
- c) Epinephrine - Dilute 1 ml (1:1000) adrenalin to 10 cc (1:10,000). Give 5 ml I.V. bolus every 5 min during resuscitation.
- d) Sodium bicarbonate 75 ml of 7.5% solution I.V. bolus immediately after defibrillation. Repeat 75 ml bicarbonate bolus in 10 min if effective circulation not restored. Repeat 35 ml bolus in another 10 min if still unresponsive.
- e) Calcium chloride 2.5-5 ml of 10% solution I.V. bolus Q.10.min x 3 maximum. Do not administer simultaneously with bicarbonate because mixture gives precipitate.

Do not give to digitalized patients.

- f) Aramine (metaraminol) I.V. bolus 2-5 mg (0.2-0.5 ml) for hypotension followed by I.V. infusion 7.5-50 mg (0.75-5.0 ml) in 250 cc D5W. Maintain diastolic 90-100 mm Hg or 40 mm below usual pressure.

7. Stabilize and transfer to continued care facility.

LIFE SUPPORT SUMMARY

Basic Life Support: ABCs of Resuscitation

1. Diagnose cessation of ventilation.
2. Open and maintain airway by hyperextension of head and neck.
3. Ventilate with four quick, deep breaths.
4. Feel for carotid pulse.
5. If pulse is absent give one quick, precordial thump with the fleshy part of closed fist.
6. Check carotid pulse.
7. If pulse remains absent commence external cardiac compression. Find correct pressure point (lower one half of sternum) and place heel of hand on long axis of sternum. Do not lift hands during compression. Do not allow fingers to touch victim's chest. Give sixty compressions per minute: Ratio with two rescuers: 5 compressions to 1 breath with one rescuer, 15 compressions to 2 breaths. Rate of compression with two rescuers: one compression per second. With one rescuer the rate is 80 compressions per minute to allow for time lost during ventilation.
8. Check pupils for reaction.
9. Do not interrupt external cardiac compression for longer than 5 seconds.
10. Check carotid pulse regularly for effectiveness.

Advanced Life Support

1. Defibrillate as soon as possible.
2. Attach to cardiac monitor.
3. If defibrillation fails continue CPR (basic life support).
4. Obtain an intravenous lifeline.
5. Give sodium bicarbonate, calcium chloride, and epinephrine (separately, flushing between).
6. Check carotid pulse, monitor, and pupils.
7. Defibrillate as indicated.
8. Continue drug administration as indicated to correct acidosis and maintain adequate cardiac rhythm.
9. Continue to evaluate effectiveness by pupil and pulse checks until patient is restored.

ETC 00215

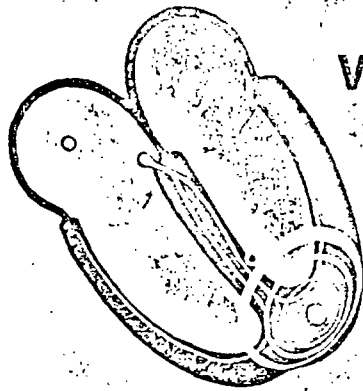
F-06278

EMERGENCY CARDIAC CARE
MAJOR DRUGS COMMONLY USED IN MI AND CPR

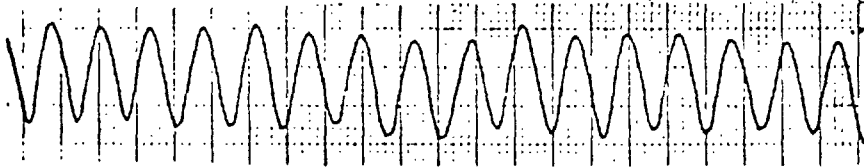
Drug	Indication	Dose		Remarks
		I.M.	I.V.	
Dextrose 5% in water	Establish I.V.	A—	250 ml	Use I.V. catheter
Epinephrine (Adrenalin) 1:1000	1. Cardiac standstill 2. Ventricular fibrillation	1.0 ml (1:100)	Caution: Dilute. Bolus 5.0 ml (1:10,000) Q.5 min during CPR	For 1:10,000 dilute 1 ml 1:1000 c 9-10 ml water
Sodium bicarbonate 7.5% solution	Acidosis from absent function circulation	—	Bolus 75 ml Q.10 min x 2 plus 35 ml once during CPR	Do not give simultaneously with calcium chloride. Flush I.V. tubes
Calcium chloride 10% solution	1. Cardiac standstill 2. Ventricular fibrillation	—	Bolus 2.5-5.0 ml Q.10 min x 3 during CPR	Do not give simultaneously with sodium bicarbonate. Flush I.V. tubes. Do not give digitalized patient.
Aramine (metaraminol bitartrate) 10 mg/ml	Hypotension a. < 90-100 mm Hg - systolic b. > 40 mm under usual in hypertensive - diastolic	0.2-1.0 ml	Bolus 0.2-0.5 ml Q.5-10 min Infusion 10 ml/250 D5W	Titrate infusion by diastolic pressure. Full effect begins 1-2 min I.V. — 10 min I.M.
Atropine sulfate 1/120 gr (0.5 mg)/ml	Sinus bradycardia under 40/min Cardiac standstill	4.0 ml 4.0 ml	Bolus 1.0 ml Q.5 min. x 4 max Bolus 2 ml once	I.M. in deltoid I.M. in deltoid
Lidocaine (Xylocaine) I.V. 20 mg/ml I.M. 100 mg/ml	Ventricular tachycardia 150-250 Premature Ventricular Contractions PVCs > 6/min or PVCs in pairs	3.0 ml of 100 mg/ml	Bolus 2.5-5 ml slowly Repeat 3-5 min once if necessary Infusion 12.5 ml/250 ml D5W at 15-60 ml/min	I.M. in deltoid with 100 mg/ml I.V. use 20 mg/ml
Morphine sulfate 15 mg/ml	Pain	1.0 ml (15mg/ml)	Caution: Dilute Bolus 1-1.5 ml (3 mg/ml) Q.5-30 min prn	For I.V. dilute 1 ml (15 mg) to 5 ml equals 3 mg/ml
Demerol 50 mg/ml	Pain	1.0-2.0 ml	—	—

ETC 00216

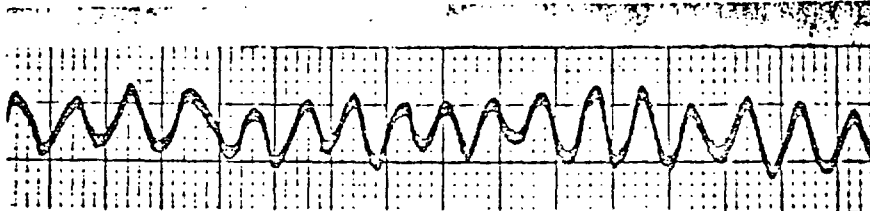
SAMPLES OF ARRHYTHMIAS



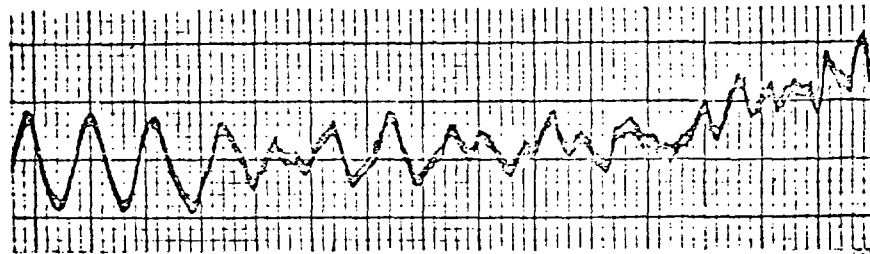
**Ventricular
Flutter**



Ventricular Flutter is produced by a single ventricular ectopic focus firing at a rate of 200-300/min. Notice the smooth sine wave appearance.



Ventricular Flutter



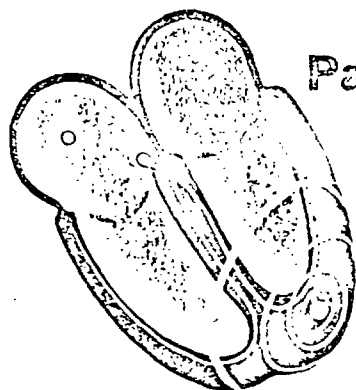
... Into Ventricular Fibrillation

True Ventricular Flutter almost invariably becomes Ventricular Fibrillation requiring cardio-pulmonary resuscitation and defibrillation. During Ventricular Flutter the ventricles are contracting at about 300 per minute. There is no effective cardiac output. Ventricular Fibrillation results as the many ventricular ectopic foci try to compensate.

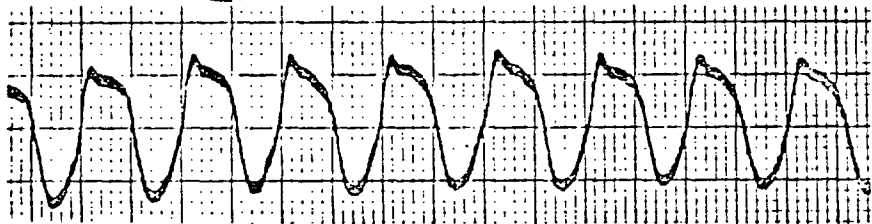
Reference:

ETC 00217

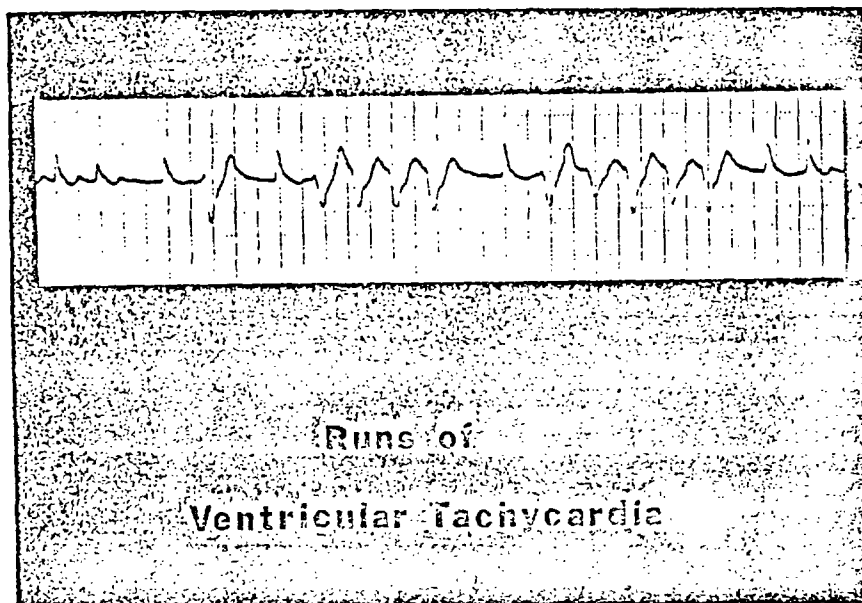
Dubin, D: Rapid Interpretation of EKG's, Tampa: Cover Publishing Co., 1970, pp 114 and 115.



Paroxysmal Ventricular Tachycardia



Paroxysmal *Ventricular Tachycardia* is initiated by a ventricular ectopic pacemaker. It has a characteristic pattern. Ventricular rate 150-250. Appears like run of PVC's.



Runs of Ventricular Tachycardia

Runs of Paroxysmal Ventricular Tachycardia may signify coronary artery disease. This rapid ventricular rate is really too fast for the heart to function effectively, so it should be treated quickly with Xylocaine.

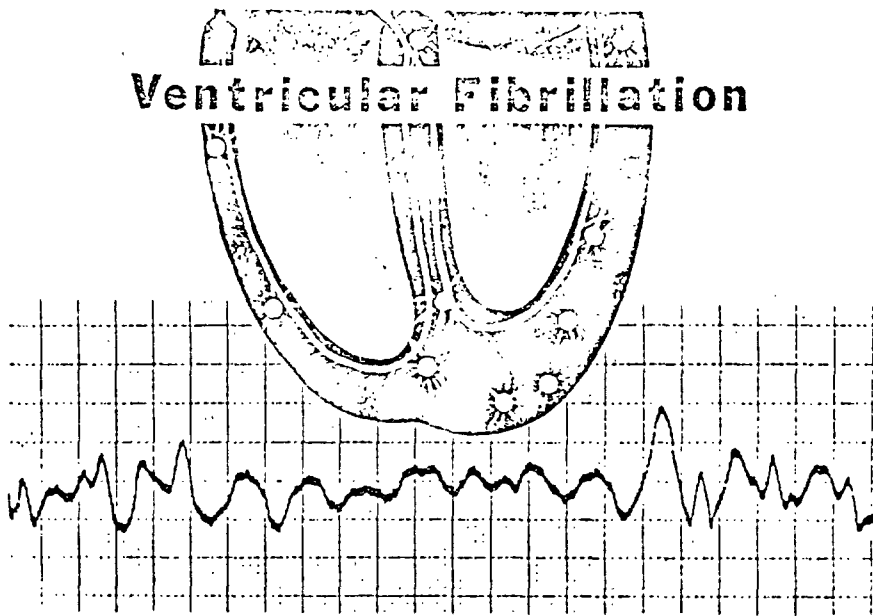
ETC 00218

E-06281

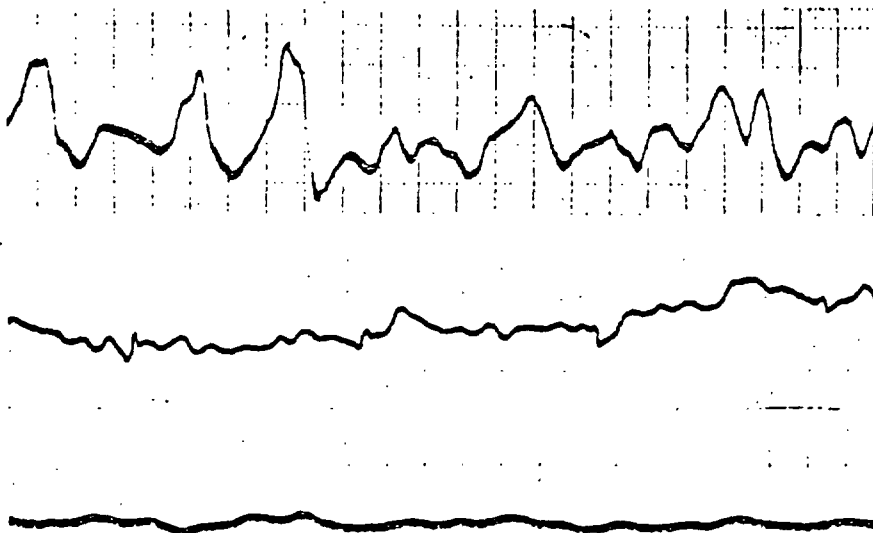
Reference:

Dubin, D: Rapid Interpretation of EKG's, Tampa: Cover Publishing Co., 1970, pp 109 and 111.

Ventricular Fibrillation



Ventricular Fibrillation is created by stimuli from many ventricular ectopic foci causing a chaotic twitching of the ventricles.



Ventricular fibrillation is easily recognized by its totally irregular appearance. If you do recognize any repetition of pattern or regularity of deflections, you probably are not dealing with ventricular fibrillation.

These three strips are a continuous tracing of the same patient's dying heart. Notice how the amplitudes of the deflections becomes less as the heart dies.

ETC 00219

Reference:

E-06282

Dubin, D: Rapid Interpretation of EKG's, Tampa: Cover Publishing Co., 1970, pp 118 and 119.

Medical Directives
Equipment

ETC 00220

F-06283

STERILIZATION PROCEDURES

I. Cold Sterilization

- A. Chlorophenyl will be used as the disinfecting solution for metallic instruments.
 - 1. Procedure: Instruments will be thoroughly cleansed with soap and water, will be free from blood and other debris before immersion into this solution. Common vegetative bacteria (except for tubercle bacilli) are destroyed in five minutes, but instruments should be immersed for not less than fifteen minutes for adequate safety.
- B. Aqueous Zepherin 1:5000 to be used in thermometers and as dip solution for throat and nasal spray nozzles.

II. Sterilization by Autoclaving

- A. General Rules
 - 1. All articles to be sterilized must be cleaned and in good condition.
 - 2. Articles to be autoclaved must be wrapped in autoclave paper, double muslin covers or placed in metal or glass container.
 - 3. Packages and containers must be dated, labeled, and initialed after each autoclaving.
- B. Autoclave time -- 30 minutes.

ETC 00221

E-06284

DIRECTIONS FOR USE OF DIATHERMY

Self-timing has simplified the diathermy treatment procedure -- simple 10-step, push-button controls let you pre-select the output, and automatic tuning takes over to maintain the selected level.

1. Press minimum output Control Switch.
2. Turn on the Main Switch and allow at least 10 seconds for warm-up time.
3. Have patient remove all metallic objects and clothing from treatment area.
4. Place double thickness terry towel over area to be treated.
5. Apply the applicator.
6. Turn the Timer Switch to 10-15 minutes.
7. Press the Number 2 Button. The meter reading should increase. Advance to required dosage.
8. Advise patient that only a pleasant sensation of warmth should be felt during treatment, and that any burning or painful sensations should be reported at once.

Treatment may be contraindicated in the following conditions:

1. Acute inflammatory processes, such as cellulitis.
2. Where there may be a tendency to hemorrhage, as gastric ulcer.
3. Ischemic tissues.
4. Impaired circulation (peripheral vascular diseases).
5. Edematous tissues.
6. Pregnancy (through abdomen or lower back).
7. On patients with cardiac pacemakers.
8. Over adhesive tape.
9. Over known areas of metallic implants.

INSTRUCTIONS FOR NEBULIZING A BRONCHIAL DILATOR DRUG (AEROLONE
COMPOUND) IN CONJUNCTION WITH THE PNEOPHORE

1. Must be ordered by Plant Physician.
2. Leave the cap off.
3. Put patient in upright position; mask in vertical position.
4. Instill 1/2 cc. of Aerolone Compound in nebulizer.
5. Check pulse rate.
6. Turn nebulizer valve 160° counter-clockwise.
7. Check pulse rate occasionally. Normally the entire 1/2 cc.
of solution can be nebulized and oxygen continued thereafter
as may be indicated.
8. If pulse rate increases by 20 - STOP MEDICATION.

NOTES:

DO NOT use nebulizer in heart cases.

ETC 00223

E-06286

65

Directions for use of Manual Nebulizer

1. Must be ordered by Plant Physician.
2. Remove the cork from the mouthpiece, and pour a sufficient but small amount of medication into the nebulizer.
3. Insert the mouthpiece far enough into the mouth so that the mist reaches the throat with gentle force.
4. Inhale deeply through the mouth and, at the same time, press the hand bulb with the entire hand.
5. Breathe out and repeat the process until 6 to 10 inhalations have been taken.
6. Repeat the treatment every 15 minutes as necessary.

ETC 00224

F-06287

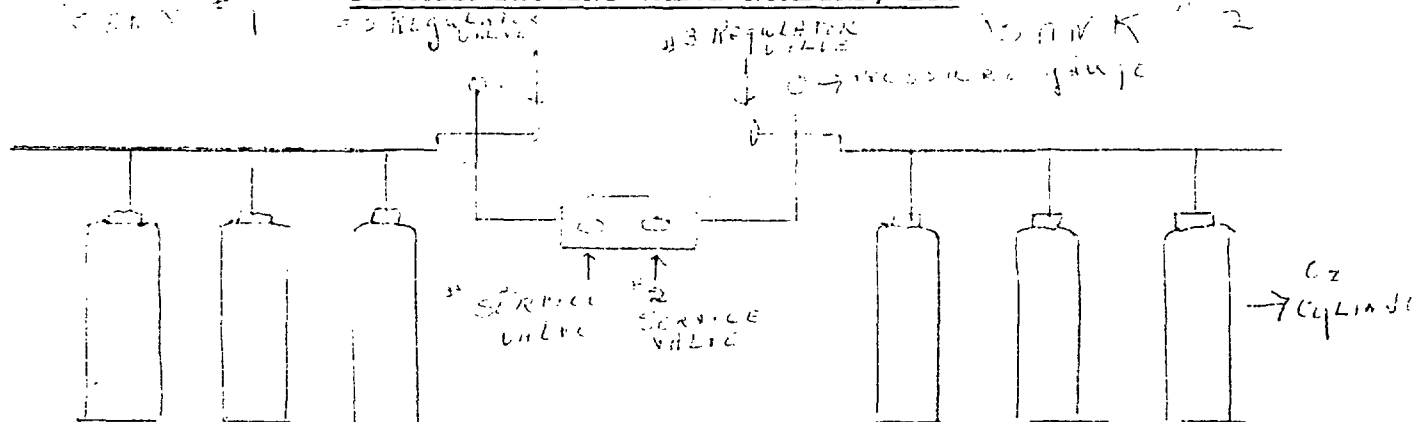
Procedure to follow if necessary to change O₂ banks on shift

1. Turn off valves on empty bank at top of all three cylinders.
2. Turn off Service Valve (No. 2).
3. Turn Regulator Valve (No. 3) counter clockwise -- to take pressure off system.

To cut on new bank

1. Open valves at top of all three cylinders.
2. Open Service Valve (No. 2).
3. Turn regulator valve clockwise to 28 or 30 lbs. of pressure.

DIAGRAM SHOWING VALVE NUMBERS, ETC.



ETC 00225

F-06288

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DIRECTIONS FOR USE OF ULTRASOUND

Treatments may be given by Charge Nurse and shift nurses.

1. Turn generator on.
2. Position patient in a comfortable position.
3. Instruct that any feeling of burning or pain should be mentioned.
4. Apply gel by spreading generously over both, part to be treated and the sound head.
5. Move applicator in circular, overlapping strokes or by to-and-fro strokes.
6. Treatment will be ordered by Plant Physician and will be for 7 minutes, unless otherwise specified by M.D.

Underwater Application

Used when irregular areas of the body offer a poor surface for contact.

1. Part to be treated and the transducer are submerged in water.
2. Move transducer over the area, keeping the head approximately $\frac{1}{2}$ -1" away from the part.
3. Wipe air bubbles away as they appear so as to ensure proper transmission of energy to the tissues.

ETC 00226

F-06289

Directions for Use of Whirlpool

1. Temperature of the water should be 105° to 110°.
2. Position jet nozzle to direct water directly onto the part being treated.
3. Duration of treatment 20 minutes

To fill tank

1. Open main water valve.
2. Adjust mixing valve to proper temperature setting. Watch temperature gauge as the tank fills.
3. Fill tank to within five inches of the top.
4. Place patient in position.
5. Turn motor switch on

NOTE:

Never turn motor switch on to operate turbine ejector pump unless the pump is completely submerged in water.

ETC 00227

F-06290

INSTRUCTIONS FOR USE OF HYDROCOLLATOR

Operation

1. The unit is turned on and off with a Toggle Switch located on the control panel at the lower rear of the unit.
2. The thermostat has been preset at the factory to normal operating temperature. Do not adjust. Notify supervisor if adjustment is needed.
3. Only the front and rear sections of the steam pack rack can be adapted to contain the neck contour pad.
4. Submerge the pack into the water of the tank so that the rectangular sections are standing vertically and the loops are sticking above the water for easy removal. Always keep water level over top of pack.
5. Replace pack in tank after use -- do not allow to dry out.
6. Check water level daily.

Safety Instructions

1. Never put your hands directly into the water. The temperature of the water is approximately 160 degrees Fahrenheit and can cause skin burns.
2. Be especially careful when inserting or removing the steam pack. Splashing or dripping of water 160 degrees could cause burns.
3. Always use the loops on corners of steam pack for inserting into and removing out of the water.

Application of the Steam Pack

Steam packs may be applied without an order from a physician.

1. Place six layers of toweling on the area to be treated.
2. Never lay the patient on the steam pack. Always apply the pack to the patient.
3. Remove the steam pack and wrap it in one layer of toweling before placing it on the layers of towels.
4. Cover the steam pack with a layer of toweling to minimize heat loss.

ETC 00228

...USE OF HYDROCOLLATOR - contd.

5. During treatment, check the condition of the patient on the treated area.
6. Always have patient inform you if pack is too hot.
7. Exercise caution when applying pack to thin skin or "bony areas."
8. Never lay one pack on top of another.
9. Do not use packs directly over cuts and abrasions.
10. Do not use packs in conjunction with skin balms and linaments.

ETC 00229

F-06292

Chemical Hazards

ETC 00230

F-06293

69

Chemical Hazards

1. Obtain a complete history
 - a. How long the possible exposure lasted?
 - b. How long ago did it occur?
 - c. Was there any coughing, choking, nausea or headache at the time of or shortly after exposure?
 - d. Did an undue degree of lassitude come on after exposure?
 - e. What was the chemical? If employee doesn't know, get this information from his foreman.
2. Record signs and symptoms
3. Notify plant physician.

ETC 00231

F-06294

ANILINE

Aniline is highly toxic. Immediate and thorough washing with lots of water and soap. It is important that no tiny spots of aniline remain on the skin or scalp. Special attention should be given the areas around the fingernails and toenails, using a brush if possible. Contaminated clothes should be washed before wearing again, or destroyed if badly contaminated. Shoes and gloves should be burned. Oxygen should be given if skin or lips are blue. Plant Medical Director is to be notified of all aniline exposures.

Aniline changes hemoglobin to methemoglobin so the blood cannot carry enough oxygen. Moderate exposure may cause only a bluish or blackish discoloration of lips, cheeks, fingernails or ears. In more severe cases there may be headache, weakness, or irritability. If exposure continues, drowsiness, shortness of breath, unconsciousness or even death can occur.

The symptoms described clear in a few hours if absorption is promptly stopped by thorough bathing and removal from odors. If the bathing is not absolutely thorough, the patient's condition will worsen for several hours.

The patient must be warned to drink no alcohol and to take no headache pills except plain aspirin.

ETC 00232

E-06295

BENZENE

HEALTH HAZARDS:

The principal hazard is from inhalation of vapors of benzene.

CONTACT WITH SKIN AND MUCOUS MEMBRANES:

Clothing contaminated with benzene should be removed immediately.

CONTACT WITH THE EYES:

If liquid benzene enters the eyes, flush thoroughly with plenty of water for at least 15 minutes. If irritation persists, secure medical attention.

TAKEN INTERNALLY:

There is no specific antidote for benzene poisoning. Do not induce vomiting. Call a physician. Keep patient warm and quiet.

INHALATION:

In case of unusual exposure, call a physician immediately. To prevent collapse, the patient should lie down without a pillow and be kept quiet and warm.

If patient is unconscious, and oxygen inhalation apparatus is available, oxygen should be administered but only by a person authorized for such duty by a physician.

ETC 00233

E-06296

CAUSTIC POTASH

72

HAZARDS:

Marked corrosive action results from contact with all tissues of the body.

GENERAL PLAN:

Speed in removing caustic potash is of primary importance.

Refer the injured persons to a physician even when the injury appears to be slight. Give the physician a detailed account of the accident.

GENERAL FIRST AID:

Irrigation and prolonged application of water to the affected areas should be continued for as long as one to two hours. If 5 per cent ammonium chloride or 5 per cent zinc chloride solutions are on hand, wash the affected areas promptly and thoroughly with these solutions. However, if they are not immediately available, no time should be lost awaiting them, but copious amounts of water should be used. No oil or ointment of any kind should be applied to burned areas within the first 24 hours after contact, and subsequently without the sanction of the attending physician. A physician should be called at the earliest possible moment.

CONTACT WITH EYES:

Eyes should be irrigated immediately with copious amounts of water for a minimum of 15 minutes. The eye lids should be held apart during the irrigation to ensure contact with the water with all the tissues of the surface of the eye and lids. A physician, preferably an eye specialist, should be called at the first possible moment. If a physician is not immediately available, the irrigation should be continued for a second period of 15 minutes. After the first 15 minute period of irrigation is completed, it is permissible as a first aid measure to instill 2 or 3 drops of an 0.5% pontocaine solution or an equally effective aqueous topical anaesthetic. No oils or oily ointments should be instilled unless ordered by the physician.

TAKEN INTERNALLY:

F-06297

Ingestion of caustic potash causes severe burns of the mucous membranes of the mouth, throat, esophagus and stomach. Here, chemical neutralization may be attempted. Dilute vinegar or a 5% solution of ammonium chloride may be administered freely if at hand. If they are not immediately at hand, the patient should be encouraged to drink a large quantity of water without delay. After free caustic potash has been diluted with water or chemically neutralized, whites of eggs or mineral oil may be administered. A stomach tube should not be inserted except by the attending physician.

ETC 00234

MEDICAL DIRECTIVES AND NURSING PROCEDURES

Chlorine Exposure

Chlorine is a highly irritant gas, and combines readily with moisture to liberate nascent oxygen, and to form hydrochloric acid. Chlorine is so irritant that it may give rise to reflex spasm of the glottis, so that no further penetration of the lungs can take place. If it gains entry to the bronchi, it produces a necrosis of the bronchial epithelium. Inflammation of the eye, nose and throat, after exposure may be intense. If the bronchial tubes are involved, pain and a sense of constriction in the chest develop. Pulmonary edema will follow a heavy exposure.

1. Take history, pulse, and respiration.
2. Administer O₂ by I.P.P.B. with sterile water or saline (10-15 cc) in Nebulizer.
 - a. Have patient sit directly in front of and facing the unit in a straight-backed chair.
 - b. Instruct to breathe slowly and deeply during treatment.
3. If not improved in 30 minutes (or if clinically worse or in severe distress at an earlier time), notify Plant Physician.
4. If improved in 30 minutes:
 - a. Give Orthoxicol cough syrup (dispense 2 oz.) instruct to take one teaspoon every 3-4 hours as needed for cough.
 - b. Allow to return to work.
 - c. Reassurance — Lots of this, especially if this is patient's first experience with chlorine, Stay calm and stay near the patient. He needs to know his condition will improve gradually. Call the doctor if you feel the patient is not doing well.

ETC 00235

MEDICAL DIRECTIVES AND NURSING PROCEDURES

CHLORINE EXPOSURES

Bronkosol will be available for you to administer by IPPB upon orders of the Ethyl physician. This should only be requested for other-than-mild exposures.

Before requesting an order, ascertain any history of hypertension, cardiac arrhythmias, hyperthyroidism or acute myocardial injury to relate to the Ethyl physician. The Ethyl physician will then decide what dose should be given.

ETC 00236

5-06299

INSTRUCTIONS TO NURSES - CYANIDE POISONING

(Includes Acrylonitrile)

Become thoroughly familiar with the attached instructions "First Aid for Cyanide Poisoning". These instructions have been made available to the workers in the cyanide areas.

Cyanides are very rapid in their effects, killing instantly if present in sufficient amounts. It is this speed of action, rather than the smallness of the fatal dose, which has given cyanide the reputation as the most powerful common poison. On the other hand, in sublethal doses, cyanides are rapidly detoxified by the body. If a victim can be kept alive for a while after exposure, complete recovery may be expected.

When the special alarm rings indicating a cyanide emergency, immediately gather your equipment and prepare to board the ambulance. At the scene of the emergency, make certain that the appropriate procedures as outlined in "First Aid For Cyanide Poisoning" are being properly carried out. Assume care of the patient(s) and continue necessary first aid as indicated as the patient is transported to Plant Medical. Any person who works with cyanide or is in the vicinity of a cyanide release and is suddenly taken ill should be managed as if poisoned by cyanide. This includes, for example, such a person if he has suffered a fall and is unconscious.

If a physician is not present at Plant Medical to assume direction of treatment, and such direction seems indicated, telephone the on-call physician and inform him of the nature of the emergency.

If the physician is to come to Plant Medical, continue the appropriate treatment as outlined in "First Aid For Cyanide Poisoning" until he arrives, unless the physician specifically directs otherwise.

If the patient is to be taken to the hospital or the physician's office on an emergency basis, accompany the patient, continue first aid as indicated and be certain to carry a complete Cyanide Antidote Package (Eli Lilly) for each patient. Remain with the patient until the physician assumes his care.

Be aware that a patient poisoned by cyanide may be conscious but confused, disoriented and agitated. Sufficient personnel should be made available to control such a patient. Do not keep persons needed to control the cyanide release from returning to their duties. Secure from elsewhere the assistance that might be needed to help restrain such a patient.

The following guides may be of use:

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Any person thought to have swallowed cyanide should be seen by a physician.

Any person who has been rendered unconscious by cyanide, even momentarily, should be seen by a physician.

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A physician should be contacted by telephone before releasing any patient who has had any symptoms possibly related to cyanide exposure.

Any person thought to have been exposed to cyanide should be kept under observation at Plant Medical for at least 2 hours. If no symptoms have been present, the patient may then be allowed to return to work.

Acrylonitrile cannot be removed from leather and can cause skin burns - so remove and discard contaminated shoes.

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FIRST AID FOR CYANIDE POISONING
(including acrylonitrile)

Note: Administer emergency first aid immediately. Don't leave patient to seek help. You need that time to give first aid.

Toxicity

Poisoning can occur by breathing cyanide-contaminated air, by absorption of vapor and liquid cyanide through the skin and by swallowing cyanide.

If a person works with cyanide or is in the vicinity of a cyanide release and is suddenly taken ill, cyanide poisoning should immediately be suspected. The earlier symptoms of cyanide poisoning may be weakness, dizziness, headache and occasionally nausea and vomiting. In more serious cases there is usually violent breathing and weakness which may progress to unconsciousness, violent convulsions and paralysis.

General Instruction for All Conditions

- A. Walk, carry or drag the patient to fresh air, upwind.
- B. Have the patient lie down; if clothing contaminated, deluge with large quantities of water, remove all clothing and wash the skin thoroughly.
- C. If amyl nitrite pearls are used, keep them away from you own nose and mouth. Otherwise you may inhale enough amyl nitrite to become dizzy and unable to give proper help to the patient.
- D. In every case of cyanide poisoning notify Plant Medical immediately for medical treatment.
- E. Never give liquids to an unconscious patient.
- F. Do not give mouth to mouth artificial respiration to a cyanide patient.

First Aid of Cyanide Patients who are not Breathing

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- A. Start artificial respiration immediately using the bag and mask from the cyanide first aid locker.
- B. Crush an amyl nitrite pearl (from cyanide first aid locker) and put it in mask. Continue to inflate patient's lungs with bag for about 20 seconds, then remove (retain) pearl and continue artificial respiration for about 40 seconds, then repeat with same pearl in mask, etc. for a total of 5 minutes. The pearl is then exhausted and should be discarded.
- C. If the patient begins breathing on his own, place the amyl nitrite pearl in a cloth (as a handkerchief) and hold it lightly over his nose at the same intervals and for the same length of time as if giving artificial respiration.
- D. If the patient recovers consciousness, discontinue amyl nitrite. Resume amyl nitrite should the patient lapse back into unconsciousness. Continue to observe patient constantly.
- E. After the first amyl nitrite pearl is exhausted, if further amyl nitrite is needed (i.e., if patient still not conscious), crush

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another pearl, administering to patient for 20 seconds at 2 to 3 minute intervals thereafter. This can be done for as long as 1/2 hour (using fresh pearls about every 5 minutes), by which time medical assistance should be available. Discontinue if patient recovers consciousness.

First Aid for Cyanide Patients who are Breathing

- A. If the patient is conscious, do not give any medication. Keep patient under close observation, however.
- B. If patient is (or becomes) unconscious or has marked breathing difficulty, crush an amyl nitrite pearl (from cyanide first aid locker) in a cloth (as a handkerchief) and hold lightly over patient's nose for 20 seconds of every minute for 5 minutes. Give artificial respiration (as described in previous section) should the patient stop breathing.
- C. If the patient recovers consciousness and experiences relief from breathing difficulty, discontinue amyl nitrite but continue to observe patient constantly.
- D. Resume amyl nitrite if unconsciousness recurs, giving for 20 seconds every 2 to 3 minutes. Discontinue if patient again recovers consciousness.

First Aid for Person Who Has Swallowed Cyanide

- A. If patient is conscious, give patient about one pint of 1% sodium thiosulfate solution (from cyanide first aid locker) by mouth. Repeat until vomit fluid is clear.
- B. Crush an amyl nitrite pearl (from cyanide first aid locker) in a cloth (as a handkerchief) and hold lightly over patient's nose for 20 seconds of every minute for 5 minutes. Pearl is exhausted and should be discarded after this.
- C. If patient is conscious after this, do not give more amyl nitrite. Continue to observe the patient constantly.
- D. If the patient lapses into unconsciousness again (or remains unconscious), crush another amyl nitrite pearl and administer as above for about 20 seconds every 2 to 3 minutes. Discontinue if patient recovers consciousness.

Diazomethane

R & D personnel may present with exposure to this material. Emergency treatment of respiratory symptoms is as for chlorine exposure. The physician on call should be contacted for further instructions.

Skin exposure may result in a delayed severe skin irritation, so even minor exposures should be asked to return for repeat evaluation.

DEA (Diethylaniline)

DEA has an effect like aniline only it is less toxic. However, patient should be handled as for aniline, since it is always possible there may be some aniline in the DEA.

DOWTHERM

Dowtherm has strong odor. Is not especially poisonous but should be washed off with soap and water and clothes changed.

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ETHYL CHLORIDE

GENERAL:

Ethyl chloride presents some hazard through inhalation because of its narcotic and anaesthetic action. It is slightly irritating to mucous membrane, - it may be absorbed to some extent through the skin, and may also have some local effect on the skin through its refrigerant effect, which under some conditions can produce frost bite. When inhaled it is rapidly absorbed, but is also rapidly eliminated. No form of chronic poisoning has been reported.

When ethyl chloride is decomposed by heat, hydrochloric acid may be one of the decomposition products. This, if inhaled, is a very active irritant to the respiratory mucous membrane.

FIRST AID:

If the exposure has been extreme and extended, the victim is unconscious and breathing has stopped, artificial respiration should be started immediately. Call a physician at once. Oxygen should be administered. If ethyl chloride may have been decomposed by heat with the formation of hydrochloric acid, there may develop severe lung congestion. After such exposure inhalation of 100% oxygen is indicated.

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ETHYLENE

HEALTH HAZARD:

The liquid may be absorbed through the skin, causing systemic toxicity, CNS depression, kidney and liver damage.

SKIN:

Wash exposed areas.

EYES:

Flush with water.

INGESTION:

Induce vomiting. Call a physician.

INHALATION:

Remove patient to uncontaminated air at once. If breathing has stopped, administer artificial respiration. Call a physician. Can cause pulmonary oedema.

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ETHYLENE DIBROMIDE

HAZARDS:

Causes irritation of all exposed tissues, respiratory tract, skin and eye. Death can occur from skin absorption. Acute toxicity equivalent to that of carbon tetrachloride or methyl bromide. May produce vesiculation on skin contact and very probably if confined under any skin covering.

FIRST AID:

Exposed skin must be washed promptly with an abundance of soap and water. If cyanotic, administer oxygen.

SPECIAL MEDICAL PROCEDURES:

Keep patient under medical observation for at least 48 hours. Appreciable skin exposure may result in not only inflamed, sensitive areas, but considerable vesiculation. A 48-hour medical observation period for delayed systemic or cutaneous effects is advised.

NOTE: Shoes exposed to concentrations greater than 3.4% should be destroyed.

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F-06307

ETHYLENE DICHLORIDE

GENERAL:

Most important in the case of any poisoning is quick removal from exposure. In the case of ethylene dichloride poisoning, this means first removing the patient from the contaminated atmosphere and, insofar as possible, removing the ethylene dichloride from the patient's respiratory tract, skin, or gastro-intestinal tract.

Keep the patient quiet and comfortably warm. Call a physician immediately.

INHALATION:

In case breathing has stopped, effective artificial respiration should be started immediately. Oxygen should be administered. If the patient is conscious, hot tea or coffee may be given as a stimulant.

SKIN:

All contaminated clothing should be removed at once. All affected areas should be washed thoroughly with warm water and soap. After this an ointment containing lanolin should be applied in order to replace the natural skin oils. For serious or persistent cases of skin trouble, and for signs and symptoms of generalized poisoning, a physician should be consulted.

CONTACT WITH EYES:

If liquid ethylene dichloride has entered the eyes, they should be washed promptly with copious quantities of water for at least 15 minutes. Ethylene dichloride vapour can produce injury to the eyes if the exposure is intense or prolonged to higher concentrations. Eyes should be irrigated for vapour in the same manner as for the liquid. Medical attention should be obtained in all these contacts with the eyes.

INGESTION:

If a person has swallowed ethylene dichloride, he should be induced to vomit. This procedure should be repeated at least three times and then followed by the administration of a tablespoon of epsom salts. A physician should be called at once.

Ethyl Corporation

Corporate Medical Department

Baton Rouge, Louisiana

Applies to:

- ☒ Corporate Activities
- ☒ Domestic Field Sites
- ☒ Domestic Affiliates
- ☐ International

Guide Number: 03-007

Subject: Hydrofluoric Acid and
Related Materials

1. Workers Medical
Surveillance
2. Emergency
Treatment

Issued: October 17, 1979

Effective: October 17, 1979

PURPOSE

- . To establish guidelines to protect the health of employees exposed to hydrofluoric acid and related materials

RESPONSIBILITIES

Toxicology and Industrial
Hygiene Department

- . Conduct periodic surveys of operations producing or handling hydrofluoric acid and related materials
- . Report findings and recommendations to Plant Manager, Plant Medical Department and Corporate Medical Department.

Medical Department

- . Provide pre-placement and periodic physical and laboratory examinations on hydrofluoric acid and related materials workers where indicated.
- . Determine who qualifies for periodic medical surveillance examination.
- . Provide for emergency treatment of employees who may have an accidental exposure.

Local Management

- . Identify employees with potential hydrofluoric acid and related materials exposure.
- . Notify eligible employees to report for pre-placement and periodic examinations.

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RESPONSIBILITIES (continued)

Local Management (continued)

- . Inform Medical Department and Toxicology and Industrial Hygiene Department of any contemplated or implemented change in handling or processing hydrofluoric acid and related materials.
- . Maintain an emergency hydrofluoric acid and related materials kits for first aid and medical personnel.
- . Arrange for more definitive care when indicated.

BACKGROUND

- . Hydrofluoric acid (HF) and related materials (act like or produce hydrofluoric acid) have the potential to produce severe and painful skin burns and severe pulmonary edema. Skin contact with high concentrations will cause burns immediately and severe deep burns within hours because fluorides penetrate to seek bone. Inhalation of high concentrations will cause pulmonary edema immediately. Low concentrations can cause severe skin injury within 24 hours if not treated early. Low concentrations produce no immediate symptoms; therefore, it is important to remember 'exposed skin that is wet should be treated as an HF exposure'.
- . Immediate and adequate treatment can reduce HF injury to a minimum.
- . Chronic exposure to excessive concentrations of fluoride over a period of years results in increased radiographic density of bone and eventually may cause crippling fluorosis (weakened bone due to deposition of fluoride). Fluorosis does not occur at the OSHA threshold limit standards for the workplace.

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SYMPTOMS OF EXPOSURE

- . Burns may occur without symptoms when exposed skin is wet.
- . Mild irritation of the eyes, nose and respiratory tract.
- . Stinging of exposed skin.
- . Mild to severe deep burns of the skin.
- . Choking and coughing.
- . Shortness of breath and cyanosis (blue lips and nail beds).
- . Pulmonary edema (wet lungs).

TREATMENT

- . A hydrofluoric acid and related materials first aid kit shall be maintained in the immediate work area for first aid and medical personnel. The label, instructions and contents are listed in Appendix A.
- . The HF Treatment Kit shall accompany an employee being sent to a physician for HF exposure. Information for medical personnel is listed in Appendix B.

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LABEL FOR OUTSIDE OF FIRST AID KIT FOR
HYDROFLUORIC ACID (HF) AND RELATED MATERIALS

Contents:

First Aid Instructions for Hydrofluoric Acid
Information for Medical Personnel (Physician Use Only)
Zephiran chloride 0.13% solution, aqueous - 2 gallons
Zephiran chloride 0.13% solution is made by adding 1 ounce
17% stock solution to 1 gallon water
Gauze pads, 20 4" x 4"
Calcium gluconate 3% in petrolatum
Calcium gluconate USP ampules, 10 ml, 10% w/v, 4 ampules
(Physician Use Only)
Moisturized oxygen with mask. Location _____

NOTICE

IF INDIVIDUAL IS TRANSPORTED TO MEDICAL
PERSONNEL FOR TREATMENT, TAKE ALONG THE
HYDROFLUORIC ACID TREATMENT KIT.

For additional medical information, contact:

Gilbert B. Meyers, M.D.
Corporate Medical Director
Ethyl Corporation
451 Florida Boulevard
Baton Rouge, Louisiana 70801
Telephone - 504/388-7651
Home Telephone - 504/924-8060

or

Walter C. Hulon, M.D.
Assistant Medical Director
Ethyl Corporation
451 Florida Boulevard
Baton Rouge, Louisiana 70801
Telephone - 504/388-8175
Home Telephone - 504/275-6391

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FIRST AID INSTRUCTIONS FOR HYDROFLUORIC ACID (HF)

AND RELATED MATERIALS CONTACT

Skin Contact:

1. Remove from contaminated area.
2. Flush immediately with copious amounts of water for 15 minutes.
3. Remove contaminated clothing while under the shower, including shoes.
4. Cover contact areas with gauze dressings soaked with 0.13% zephiran solution from the first aid kit.
5. Transport patient to physician, continuously keeping the gauze soaked with zephiran solution.
6. Be sure to take the Hydrofluoric Acid Treatment Kit with patient to physician.

NOTE: Skin contact with HF may not have any apparent evidence of exposure for several hours. Therefore, it is imperative that first aid be administered for suspected exposure because a very weak solution of HF can cause severe burns if in contact with skin for a protracted period of time.

7. For superficial fume burns of exposed skin, calcium gluconate 3% in petrolatum can be applied.

Eye Contact:

1. Significant HF contact with the eye will cause immediate symptoms of slight irritation to severe pain.
2. Remove employee from contaminated area.
3. Immediately begin eye irrigation with copious amount of plain water for at least 15 minutes. Use a gentle force to avoid injuring the eye.
4. The lids should be held opened by gently separating the eyelid with the fingers.
5. After irrigation for 15 minutes, apply compress wet with 0.13% zephiran solution to the closed eye.
6. Transport the employee to a physician as soon as possible while continuing the wet compresses.
7. Take the Hydrofluoric Acid Treatment Kit with the employee.

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Inhalation:

1. Inhalation of HF fumes of significant concentration will cause respiratory irritation such as coughing, choking, shortness of breath and may cause pulmonary edema and possible death within hours.
2. Immediately remove employee from contaminated area.
3. If there is difficult breathing, coughing or choking, give moisturized oxygen by mask.
4. Wash face as soon as possible with 0.13% zephiran solution in order to prevent any latent facial burns.
5. Transport to a physician immediately.

Ingestion:

1. Since HF is very irritating to the mucous membranes of the mouth and pharynx in small amounts, only minimal amounts are usually ingested.
2. Encourage employee to rinse the mouth with cold or ice water and to drink as much water as possible.
3. DO NOT ENCOURAGE VOMITING.
4. Milk or mineral oil may be given for a soothing effect.
5. Refer for medical treatment.

WARNING FOR ATTENDING PHYSICIAN:

THIS PATIENT HAS BEEN EXPOSED TO HYDROFLUORIC ACID.

BE AWARE OF THE FOLLOWING:

MODE OF CONTACT

1. Inhalation

Delayed pulmonary edema (6-8 hours after exposure).

2. Skin Contact

(a) Small area, (1")

Fluoride ion penetrates to the bone. Inject, (intra dermal and subcutaneous) area around burn with 10% Calcium gluconate.

(b) Large Area, (>2% BSA)

Severe unpredictable hypocalcemia with possible fatal cardiac arrhythmia - monitor vital signs & serum calcium and have I.V. Calcium solution ready for use.

CONTACT ETHYL PHYSICIAN

Appendix B

INFORMATION FOR MEDICAL PERSONNEL

Hydrofluoric acid (HF) and related materials have the potential to cause painful and severe burns of the skin, eyes, lungs and mucous membranes. The success in treatment of these burns is dependent on the speed of treatment. The trauma of the exposure can be reduced to a minimum if the correct treatment is given quickly.

ZEPHIRAN CHLORIDE SOLUTION

1. Aqueous zephiran chloride solution can be obtained as a 0.13% solution in one-gallon bottles (Winthrop).
2. Aqueous zephiran chloride solution 0.13% can also be made from 17% stock aqueous zephiran chloride solution by using one ounce of 17% zephiran to one gallon of water.

SKIN

The patient should arrive with 0.13% aqueous zephiran solution compresses on the affected area. Remove the compresses to assess the burn. If all the acid has not been neutralized, the skin will be marble-white. If all acid has been neutralized, the skin will be a pinkish color. However, treatment should continue for a minimum of 30 minutes after the skin becomes pinkish.

If the affected area lends itself to immersion, then immerse the area in ice cold 0.13% aqueous zephiran solution 5 to 10 minutes, remove 3 to 5 minutes and immerse again. (This is to prevent injury due to the cold solution.) For areas that cannot be immersed, use compresses soaked in ice cold 0.13% zephiran solution and irrigate frequently.

In most cases, this process will relieve pain and reduce the burn trauma to a minimum. Again, caution is to be used to prevent harm to skin or tissues due to the cold solution.

Calcium Gluconate Infiltration

If the burns appear to be deep, or if there is exquisite pain, the painful areas should be cautiously injected with 10% calcium gluconate. The calcium gluconate injections should be in small quantities in order not to distend the tissues and be injected through a 30-gauge needle. The calcium gluconate is infiltrated directly into the affected dermis and subcutaneous tissue through use of a technique similar to the infiltration of a local anesthetic agent. Approximately 0.5 ml of calcium gluconate/cm of burned surface area is a rough guide to the

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usual effective dose. The infiltration is carried 0.5 cm away from the margin of the obviously injured tissue into the surrounding, apparently uninjured, area.

Local Anesthesia

Block anesthesia can be used if necessary. If anesthesia is not used, the patient's pain may be used as a monitor for the smallest effective amount of calcium gluconate. Furthermore, the patient can accurately localize the areas requiring treatment.

Debridement

HF burns that develop over a period of time, 24 hours plus or minus 2 hours, are usually accompanied by purulent, tense blisters which are generally quite painful. In such cases, the physician should debride the blisters.

After the calcium gluconate injection, the burnt area of patients with severe burns may be carefully debrided. The physician should not hesitate to remove the fingernail if there is any question of serious subungual exposure.

Aftercare

If an extensive debridement is performed, the patient should probably be hospitalized. The hand should be dressed in a soft, bulky dressing, elevated and observed carefully for the next 48 hours. If the pain recurs, additional calcium gluconate injections should be given.

EYES

The patient should have had his eyes flushed with water before his arrival. If there is pain, Pontocaine 0.5% ophthalmic drops can be instilled in order to evaluate the trauma. The eyes should be irrigated again with the eyes open for a minimum of 15 minutes. The patient should be referred immediately to an ophthalmologist.

Zephiran chloride solution 0.05% can be used to irrigate the eye in order to neutralize the acid. (A 0.05% solution can be made by using 1/2 ounce 17% stock solution in one gallon of water, or by diluting the 0.13% solution with equal amount of water.)

LUNGS

Patients that have inhaled moderate amounts of hydrofluoric acid are at a high risk of developing either immediate or delayed pulmonary edema. The patient should have moisturized

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oxygen continued as long as necessary. Close observation should be continued for 24-48 hours. The patient should be treated as an acute adult respiratory distress syndrome if pulmonary edema develops.

MOUTH AND GI SYSTEM

If ingestion has occurred, it will usually be only a minimal amount because of the highly irritating effect of HF. The patient should drink large amounts of water. Milk or mineral oil may be given for a soothing effect. Try to avoid having the patient vomit.

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DRUGS USED FOR HF EXPOSURE

Zephiran chloride (Winthrop) (benzalkonium chloride) supplied as:

1. Aqueous solution of 0.13% zephiran chloride in pint and gallon bottles
2. Aqueous stock solution of 17% zephiran chloride used to make the 0.13% and 0.05% solution

3% calcium gluconate in petrolatum

10% calcium gluconate for injection

Pontacaine 0.5% ophthalmic drops

Mineral oil

References:

Chemical Hazards of the Workplace, Nick H. Proctor, Ph.D. and James P. Hughes, M.D., J. B. Lippincott Company, 1978, pp. 290-293.

Hydrofluoric Acid Burn Management, Medical Series Bulletin No. 17-70, Industrial Hygiene Foundation of America, Pittsburgh, Pennsylvania.

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MEDICAL DIRECTIVES AND NURSING PROCEDURES

Contact With Fluoride or Hydrofluoric Acid

1. Area personnel have instructions for immediate first aid procedures. These include the following:
 - a. Immediately put under a shower of water and remove clothing.
 - b. Notify Medical.
 - c. Immerse part in iced solution of Magnesium Sulfate
if Torso involved, compresses should be applied.
 - d. Remove to Medical.
 - e. If the eyes are involved, either by hydrofluoric acid or concentrations of vapor - irrigate immediately with copious amount of water for 15 minutes.
 - f. If exposed to gaseous hydrofluoric acid, carry at once into uncontaminated atmosphere. Do Not allow to walk. If breathing has stopped, apply artificial respiration and call for ambulance.
2. Check to see if area personnel did immediate first aid procedures and if done adequately.
3. Skin contact - continue immersing or compresses of iced or saturated solution of Magnesium Sulfate for 30 minutes.
4. Call Plant Physician.
5. Eye involvement - instill ophthalmic drops and irrigate with water for 15 minutes.
6. Gaseous exposure - Oxygen by resuscitator if necessary.
7. Have calcium gluconate, 10% ready for physician should he elect to use, together with a 10 cc syringe and a 21 gauge needle.

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HYDROCHLORIC ACID, AQUEOUS
HYDROGEN CHLORIDE, ANHYDROUS

GENERAL:

Speed in removing hydrochloric acid from the skin or eyes is of primary importance in all cases of contact with hydrochloric acid in any form.

SKIN CONTACT:

It is essential that all affected body surfaces be washed with copious quantities of running water for a sufficient time to remove all hydrochloric acid. No attempt should be made to neutralize the acid with alkaline solutions.

It should be borne in mind that in cases of severe or extensive burns, shock symptoms may occur at any time.

CONTACT WITH EYES:

Even minute quantities of hydrochloric acid should be immediately irrigated with copious quantities of running water for at least 15 minutes. A physician, preferably an eye specialist, should be called at the first possible moment. If a physician is not immediately available, the eye irrigation should be continued for a second period of 15 minutes. After the first period of irrigation is completed, it is permissible as a first aid measure to instill into the eye 2 or 3 drops of an 0.5% solution of pontocaine or other equally effective aqueous topical anaesthetic. No oils or oily ointments should be instilled unless ordered by the physician.

INHALATION:

In the rare event that a worker is overcome by hydrogen chloride, as from a sudden leak, oxygen should be administered, along with artificial respiration if breathing has stopped.

INGESTION:

Immediately give copious amounts of lime water or milk of magnesia. Use plain water if these are not readily available. Do not use sodium bicarbonate. The patient may be expected to vomit spontaneously, but no attempt should be made to induce vomiting. Do not attempt to use a stomach tube. Summon a physician at once.

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HYDROGEN SULFIDE

Extremely toxic substance (rotten-egg odor).

Signs and Symptoms:

Eye, throat and lung irritation with possible pulmonary edema, cough, frothy sputum, cyanosis, nausea, abdominal cramps, headache, nervousness, sweating, elevated blood pressure, and irrational and combative behavior.

Inhalation

1. Artificial respiration if breathing has stopped.
2. Oxygen inhalation
3. Notify Plant Physician

Eye Contact

1. Instill Dorsacaine drops and irrigate with Saline solution for 15 minutes.
2. Notify Plant Physician.

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METHYL CHLORIDE

HAZARDS:

Methyl chloride seldom causes any local irritation, but when inhaled may cause dizziness, staggering gait, drowsiness and, in severe exposures, unconsciousness and death. Repeated exposures which do not at once cause serious symptoms may be followed after a few days by more severe effects. If not fatal, recovery is usually slow.

GENERAL PRINCIPLES FOR ACUTE EXPOSURES:

Give oxygen. If respiration has stopped, start artificial respiration at once. If the patient is conscious, hot tea or coffee may be given as a stimulant. Adrenalin should not be given in a case of methyl chloride poisoning.

A physician should be called immediately.

SUGGESTIONS FOR MEDICAL TREATMENT:

Some cases of methyl chloride poisoning are drowsy, depressed or even unconscious. Use of adrenalin as a stimulant is not advisable in such cases. Other patients may show excitement and even convulsion. Chloral or chloroform as a sedative is contraindicated in methyl chloride cases.

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F-06323

TREATMENT

Background

- Organophosphates are permanent inhibitors of acetylcholinesterase. They are rapidly absorbed into the body by ingestion, through skin including the eye (even more rapidly through cuts, abrasions, areas of dermatitis, etc.), and by inhalation. Organophosphates may be direct or delayed enzyme inhibitors depending on whether the compound itself is active or whether it must be metabolized to another compound to become active. (1)
- Diagnosis of organophosphate poisoning may also be confirmed by a therapeutic trial with atropine, which is specific and effective. Marked improvement after a single dose of pralidoxime chloride (2-PAM chloride) (Protopam Chloride) is also diagnostic of poisoning. (1)
- Onset of symptoms more than 12 hours after the termination of exposure excludes the diagnosis of organophosphate poisoning. (1)
- Chronic exposure to some organophosphates may cause peripheral neuropathy.
- An emergency organophosphate poisoning antidote kit for first aid personnel should be maintained in the immediate work area.

Emergency Treatment of Poisoning by First Aid Personnel

Symptoms of Poisoning

Earliest symptoms usually include:

- Weakness
- Unsteadiness
- Blurred vision
- Headache
- Nausea
- Feeling of tightness in chest
- Constriction of throat

These may be quickly followed by:

- Vomiting
- Abdominal cramps
- Diarrhea
- Profuse perspiration
- Salivation
- Watering of eyes
- Difficulty in breathing
- Curvature of the extremities

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TREATMENT (continued)

Emergency Treatment of Poisoning by First Aid Personnel (continued)

Symptoms of Poisoning (continued)

By this time, the pupils of the eyes are usually pinpoint and nonreactive, and there is evidence of accumulation of secretions in the respiratory passages.

In severe cases, coma and convulsions may follow.

Immediate Treatment

- . Terminate the exposure.
- . Support respiration.
- . Administer atropine. (See Below)
- . Notify the Medical Department if it is open. If possible, victim should be taken to the Medical Department. If the Medical Department is closed, summon ambulance and call hospital to tell them poisoning case is on the way.

Termination of Exposure

- . The rescuer should take precautions against self-contamination by wearing rubber gloves.
- . Remove patient to an area where further exposure is impossible.

Contaminated Clothing

- . Remove contaminated clothing from patient. Place in plastic bag.

Eye Contact

- . If chemical comes in contact with eye, the eye should be irrigated immediately to prevent absorption. Eyelids should be held open and water poured directly onto eyeball.

Skin Contact

- . As soon as possible, the patient should be bathed with copious amounts of water and soap. Scrub under the nails well and wash the hair if contaminated. (2)

Ingestion

- . If the victim is conscious, immediately have him drink several glasses of water or milk and induce vomiting by having him place his finger down his throat.

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TREATMENT (continued)

Emergency Treatment of Poisoning by First Aid Personnel (continued)

Inhalation

- . Support respiration.

Supporting Respiration

- . Removal of bronchial and salivary secretions may be necessary. Place patient in prone position with head to one side. Elevate foot of stretcher. If airway obstruction occurs, loosen collar, elevate jaw, pull tongue forward and clear mucus with gauze-covered fingers, or, if possible, by suction.
- . Give oxygen as needed.
- . If patient is not breathing, artificial respiration must be begun at once and continued until he breathes or until he reaches the hospital and is turned over to hospital personnel.

Administration of Atropine

- . An injection of 2 mg of atropine (one Auto-Injector) should be given intramuscularly as soon as it is believed that insecticide poisoning has occurred. IF CYANOSIS (BLUISH LIPS OR FINGERNAIL BEDS) IS PRESENT, DO NOT GIVE ATROPINE UNTIL THIS HAS CLEARED. Give oxygen.
- . Remember that giving this 2 mg of atropine unnecessarily is not dangerous, but to delay if it is needed could be fatal.

Note:

Usually AtroPen Auto-Injectors are available. Each is a self-contained unit for the automatic administration of 2 mg atropine sulfate. If the Auto-Injector is not available, 2 mg is equivalent to three 1/100 gr or five 1/150 gr atropine sulfate tablets.

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- . If signs of recovery or symptoms of atropinization (see below) have not occurred within 10 minutes, a second injection of 2 mg atropine

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TREATMENT (continued)

Emergency Treatment of Poisoning by First Aid Personnel (continued)

Symptoms of Atropinization (Mild)

- . Dryness of mouth and throat.
- . Slight flushing of skin.
- . Slight difficulty in swallowing
- . Rapid pulse.
- . Pupils of eyes slightly dilated.
(With full atropinization, will
be widely dilated.)
- . May be mild drowsiness.
- . May be slowness of memory and
recall.
- . May be blurring of near vision.

Physician Treatment of Poisoning

Antidote Kit

- . An emergency organophosphate
poisoning antidote kit for medical
personnel should be maintained in
the Medical Department.

Contaminated Clothing

- . Remove clothing and any contamination.
Dispose of contaminated clothing in
plastic bags.

Supporting Respiration

- . Institute resuscitation by mouth
to mouth or other acceptable pro-
cedures, if indicated. Remove
bronchial secretions from airways.
- . Give oxygen as needed.
- . Give pralidoxime chloride (2-PAM
or Protopam Chloride), 2.5 gm in
100 cc of sterilized water, intra-
venously, slowly in from 15 to 30
minutes or by deep intramuscular
injection of 1 gram in 3 cc of dis-
tilled water. Repeat every half
hour if respiration weakens or
muscle fasciculation or convulsions
occur.
- . DO NOT GIVE ATROPINE IN THE PRESENCE
OF CYANOSIS AS THIS MAY PRECIPITATE
VENTRICULAR FIBRILLATION.
- . Administer atropine, 2 mg intra-
muscularly or intravenously.
Repeat dose every three to eight
minutes until signs of atropiniza-
tion occur.

ETC 00264

TREATMENT (continued)

Physician Treatment of
Poisoning (continued)

Convulsions

- . If intractable convulsions (unresponsive to antidotes) occur in severe poisoning, causes unrelated to direct organophosphate action may be responsible: head trauma, cerebral anoxia, mixed poisoning. Although not thoroughly tested in these circumstances, DIAZEPAM (Valium) (5-10 mg for adults) is probably a safe and reliable anticonvulsant. (2)

CAUTION:

Be prepared to assist pulmonary ventilation mechanically if respiration is depressed, and to counteract hypotensive reactions. (2)

Hospitalization

- . ANY PATIENT ILL ENOUGH TO RECEIVE EVEN ONE DOSE OF ATROPINE SHOULD BE PLACED UNDER HOSPITAL OBSERVATION FOR AT LEAST 24 HOURS.

Hospital Kit

- . An emergency organophosphate poisoning antidote kit containing Protopam Chloride vials and instructions for its use should accompany the employee to the hospital when feasible.

REFERENCES

- (1) Diagnosis and Treatment of Poisoning by Pesticides. U.S. EPA Office of Pesticide Programs, Washington, D.C. 20460. 1973, pp. 2-3.
- (2) Recognition and Management of Pesticide Poisonings. U.S. EPA Office of Pesticide Programs, Washington, D.C. 20460. Aug., 1977, pp. 4-8.

VENDORS

Survival Technology, Inc., 7801 Woodmont Avenue, Bethesda, Maryland 20014, ATTN: Mr. E. Bartner, phone - 301/654-2303.

Atropine Auto-Injectors are available in a kit called "Insecticide Kit" containing 5 auto-injectors + 1 trainer, 2 mg atropine each, \$35.00 per kit, prescription must accompany purchase order.

ETC 00265

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F-06328

ORGANOPHOSPHATES (DECTP and DMCTP)

67

Signs and Symptoms

Constriction of pupils, headache, vertigo, blurred vision, lacrimation, salivation, sweating, muscular weakness, ataxia, dyspnea, diarrhea, vomiting, pulmonary edema and loss of consciousness.

Skin

Remove all contaminated clothing and shower 5 minutes. Additional shower for 15 minutes after comes to Medical.

Eyes

Irrigate with normal Saline 15 minutes.

Ingestion

Give 1 oz. Syrup of Ipecac followed by massive ingestion of water to induce vomiting.

Inhalation

If breathing has stopped administer artificial respiration.

Call a physician.

For Massive Exposures

1. Transport in Plant ambulance, accompanied by nurse, to hospital emergency room along with treatment kit.
2. Notify Plant Physician on call.

A qualitative (screening) blood test kit is available. Six units of this test will be kept with other emergency supplies at all times (storage area of Surgery Room). A demonstration test will be run by the Medical Assistant for all nursing personnel. This test is intended to be used at Plant Medical when ordered by a Plant Physician in order to provide a (qualitative) confirmation of exposure in questionable cases. It will not be used for cases in which the nature and extent of an exposure already have been confirmed.

ETC 00266

F-06329

ORGANOPHOSPHATES

DR-2 PROJECT

A Pilot Plant project is now under way where the compound DR-2 is being purified for a customer. Employees probably will present themselves stating they've been exposed to DR-2.

DR-2 is a mild organophosphate. The symptoms and treatment for organophosphates (cholinesterase inhibitors) are outlined in the nursing guideline.

Probably no treatment will be necessary other than a follow-up blood test for RBC and plasma cholinesterase levels.

We do not anticipate problems with poisoning or acute toxicity but, the employees are very apprehensive and anxious about their well being and should be reassured.

The whole group has been counseled and informed by Len Guretsky, Tommy Roberts and me. They will be, and are, very knowledgeable now about exposures, toxicity, symptoms, what to expect and watch for and treatment. They have been told to especially watch the pupils of the eyes -- real pinpoint pupils are a positive sign of intoxication, requiring Atropine antidote. Be certain you know how to use the auto injectors of pre-measured doses of Atropine which are available.

If Atropine is required, give it immediately, then call the Ethyl physician.

As usual, if there are any questions, call the Ethyl physician.

ETC 00267

E-06330

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PHENOL (CARBOLIC ACID)

HEALTH HAZARDS:

Phenol is highly hazardous and exerts a local corrosive effect. It is readily absorbed through the skin, mucous membranes, gastrointestinal and respiratory tracts. Death may occur in a short time after skin contact to solutions containing high concentrations.

GENERAL PRINCIPLES:

In case of skin or eye exposure, the chemical must be removed immediately or severe injury may result.

CONTACT WITH SKIN

Time is of the utmost importance

Quart containers of decontamination solvent are located in the Medical Dept. emergency room.

1. Treat immediately with decontamination solvent (contains two parts polyethylene glycol 300 and one part 95% ethanol) Pour solvent onto contaminated area and swab with clean towel. Repeat at least twice or until area is clean.
2. Above to be followed by routine treatment as for any chemical burn.

CONTACT WITH THE EYES:

If phenol in either the solid, liquid or vapour form enters the eyes, they should be irrigated immediately and copiously with water for at least 15 minutes. The eye lids should be held apart during the irrigation to ensure the removal of the chemical from all the tissues of the eye surfaces and lids. A physician, preferably an eye specialist should be called at the first possible moment. If a physician is not immediately available, the irrigation should be continued for a further 15 minute interval. After the first 15 minute period of irrigation and if pain is still present, it is permissible as a first aid measure to instill 2 or 3 drops of a 0.5% pontocaine solution or an equally effective aqueous topical anaesthetic. No oils or oily ointments should be instilled unless ordered by a physician.

TAKEN INTERNALLY:

If a person has swallowed phenol, the injury that occurs will be due to corrosive action on the mouth, esophagus and stomach and to its systemic toxicity. The patient should instantly drink large quantities of water in order to reduce the concentration of the chemical. If vomiting does not occur spontaneously, induce vomiting. If the patient is in shock, has severe pain or is unconscious, vomiting should not be induced.

ETC 00268

Call a physician immediately.

F-06331

INHALATION:

Exposed persons should be removed from contamination immediately and a physician called. If breathing has ceased, artificial respiration should be initiated at once and oxygen administered.

Phosphonitrilic Chloride "Pinkle" PNCl_2

Vapor exposure

Eye and respiratory irritation
No residual effects
No dermal absorption

Contact with Eyes

Eye irritant which has a severe initial effect on the cornea and the conjunctiva with the latter being the more persistent

Dermal Contact

Dermal irritation - erythema with possibility of skin slough later.

Treatment

First Aid

Exposed skin must be washed promptly with an abundance of soap and water.

Eyes

Wash immediately with saline solution for 15 minutes. Call a physician.

ETC 00269

F-06332

TREATMENT OF PHOSPHORUS BURNS

First Aid Treatment

Phosphorus burns, which are classified as either second or third degree burns should be given first aid treatment appropriate to the type of phosphorus contact.

Skin Contact

- . Immediately place the patient under a cool water shower, flush eyes thoroughly with plenty of water, and remove contaminated clothing.
- . Keep burned area wet by immersing in cold water, or by applying cold water compresses.
- . Apply a saturated solution of sodium bicarbonate to the burned skin area either by compress or by soaking, or
- . Apply a dressing with "Vaseline" or an approved ointment if the burned area is small and pain subsides.
- . Get medical assistance.

Eye Contact

- . Flush the eye immediately with plain water. Continue the procedure until the patient can be examined by a physician.

Medical Treatment

Employer-~~exposure~~ designated medical facilities should examine and treat all cases of phosphorus burns.

- . Debride the burned area of phosphorus particles and dirt by surgical techniques when such debridement is indicated.
- . Clean the skin with cold water containing an antiseptic such as hexachlorophene (PHISOHex).
- . Soak burned area with saturated sodium bicarbonate solution for at least 30 minutes. Apply saturated sodium bicarbonate in lanolin on

Medical Treatment
(continued)

sterile dressing. Leave dressing in place for 24 hours.

- . If preferred, apply a 3% hydrogen peroxide solution. Keep the solution in contact with the burn for at least 20 minutes to oxidize the phosphorus.
- . Apply a sterile "Vaseline" or anti-biotic dressing after pain subsides.
- . Provide follow-up treatment, as needed, under the attending physician's direction.

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ORGANIC LEAD EXPOSURES

1. Record on Medical Treatment Report all basic information. Follow procedure as listed on the Lead Exposure Report form, using it as a guide.
2. Ensure that all information is accurate and complete.
3. Copies of Medical Treatment Report will be distributed as marked (Safety and Superviosr's Form). Place Medical copy on Medical Director's desk.
4. List badge number and name on Shift Performance sheet.
5. Type on Daily Breakdown on New Injuries sheet (on shift that exposure occurred) in red as follows: "The following had possible organic lead exposure:".

Badge Number and Name

Call the Plant Physician if:

1. Respiratory exposure (no mask) for longer than 15 minutes.
2. Respiratory exposure of any duration if elevated temperature (stem^A, fire, etc.) involved.
3. Skin (any amount) WETTED BY LIQUID TEL or TML or sludge for more than 15 minutes.
4. Skin area of greater than 20% (use "rule of 9s," as for burns) wetted by liquid TEL or TML, sludge or contaminated water for any length of time.
5. Contaminated material in eye (follow emergency treatment outlined below).
6. Contaminated material in mouth, whether or not thought to have swallowed (if swallowed, follow emergency treatment outlined below).
7. Contaminated material in wound (follow emergency treatment outlined below).

ETC 00272

Organic Lead Exposure - contd.

8. Patient has symptoms claimed due to, and/or with recent history of, unusual exposure.
9. Any exposure with peculiar or unusual circumstances.

Emergency Treatment by Nurse:

Eye -- Lavage as for caustic material. Call Plant Physicians to see if any special additional treatment or instructions are indicated.

Ingestion -- Induce vomiting by giving 15 ml Syrup of Ipecac by mouth. After vomiting, give 30 ml activated charcoal by mouth. Call Plant Physician for further instructions.

Contaminated Wound -- Immediately and thoroughly wash and scrub wound with kerosene, followed by thorough scrubbing with soapy water (if severity or location of wound seems to be contraindication, withhold this treatment pending advice from Plant Physician -- immediately life-threatening circumstances as severe bleeding, airway obstruction, shock, take precedence and should be controlled first). Call Plant Physician regarding further treatment.

ETC 00273

TEL EXPOSURES

I. Beside the accuracy of obtaining a history of the accident (blown disc, fired or no fire, etc.), it is equally important to record accurately the type of personal protective equipment worn at the time of the alleged exposure. Not only is it important to know if respiratory protective equipment was worn and how long the exposure prior to putting on the protective equipment, it is also important to know the type, i.e.:

1. Face mask -- double or single cannister?
2. How long since filter changed?
- or
3. Full-face, fresh-air mask?
- or
4. Protective clothing -- gloves, boots, slickers?

Please record the above information accurately. "Wore respirator" in response to the question is not an adequate history.

II. When an industrial hygienist is requested by Supervision at the scene of an accident, please follow the procedure below:

FIRST CALL Mr. Tommy Roberts -- home phone 357-4174.

Mr. Roberts will notify a technician, if necessary. However, if Mr. Roberts is unavailable, then notify either Mr. Maples or Mr. Kennedy, one of whom will be available at all times. Again, Mr. Roberts gets first call.

ETC 00274

F-06337

TEL Exposures -- contd.

TEL Employees Involved in Clean-up

1. If wearing cannister mask, report TEL exposure in the usual manner.
2. If wearing fresh-air mask, boots, slicker, and gloves, do not report as TEL exposure.

ETC 00275

F-06338

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Report on Lead Exposure

Employee's Name _____

Badge Number _____

Home Address _____

Telephone Number _____

If no telephone, how can be contacted:

Date and Time Exposure Reported _____ a.m.; p.m.

Date and Time Exposure Occurred _____ a.m.; p.m.

Site (in plant) of Exposure _____

Name of Foreman or Other Member of Supervision Having Knowledge
of Exposure Circumstances:

Material(s) To Which Exposed:

Liquid TEL

Liquid TML

Liquid, Mixed or Unknown (Specify)

Vapor ("smell")

Disc Blow Material

(Disc Blow fired, did not fire, unknown)

Sludge

Contaminated Water

Other (Specify) _____

Describe Incident _____

ETC 00276

Report on Lead Exposure

2.

Respiratory Exposure

Duration, Without Mask _____

Duration, With Mask (air supply or other - Specify)

Skin Exposure

Duration (Time Before Washed Off) _____

Area of Skin (Describe portion of Body Involved and Estimated % of
Total Body Involved [use "rule of 9's" as for burns]):

Other Route of Exposure

Ingestion (Estimate Amount) (Take Prescribed Emergency Action)

(Notify Plant Physician) _____

Decontamination Done Prior to Reporting to Medical (Describe) _____

Symptoms: _____

Physical Findings: _____

ETC 00277

F-06340

Report on Lead Exposure

3.

Action Taken:

- () Returned to work
- () Sent home
- () Sent to hospital _____
Name of hospital
- () Sent to outside M.D. _____
Name of M.D.
- () Plant Physician called

Name of M.D.

Date and time called

Signature of Nurse

Disposition After Review by M.D.:

- () No action needed
- () Spot urine next scheduled lead check
- () Call in for spot urine
 () send routine
 () send urgent
- () Call in to see M.D.
- () Other (Specify) _____

Date

Signature of M.D.

ETC 00278

E-06341

SODIUM HYDROXIDE (CAUSTIC SODA)

HAZARDS:

This material is strongly corrosive to all body tissues.

EYES:

Wash with copious amounts of water for 15 minutes.

Call a physician.

SKIN:

Speed in removing caustic from the skin is very important. If deep burn results, call a physician.

INGESTION:

Do NOT induce vomiting. Call a physician. Give diluted vinegar, lemon or orange juice. Also give demulcents: milk, olive oil or egg white.

ETC 00279

E-06342

TOLUENE

Acute toxic symptoms generally are the result of inhalation of vapor and acute exposure may cause headache, nausea, giddiness and loss of consciousness. It causes local irritative effect upon nose, throat and eyes, and may also produce dermatitis on sustained or intermittent skin contact with liquid.

FIRST AID

Inhalation -- If the exposure has been extreme, the victim is unconscious and breathing has stopped, artificial respiration should be started immediately. Call a physician. Administer oxygen.

Taken Internally -- Induce vomiting.

Contact With Skin -- Causes temporary burning-stinging sensation. Remove contaminated clothing, shower immediately, apply Nivea cream.

Contact With the Eyes -- May cause corneal burns. Irrigate with Saline Solution 15 minutes for vapor or for liquid.

ETC 00280

F-06343

91

TRICHLOROETHYLENE

May be harmful by inhalation, by prolonged or repeated contact with the skin or mucous membranes, or when taken by mouth.

Essentially an anesthetic, also will cause irritation of skin or respiratory tract.

INHALATION

Symptoms -- irritation of eyes, nose throat, then dizziness, nausea, vomiting and gradual suppression of consciousness.

First Aid -- Remove from contaminated atmosphere. If breathing has ceased, start artificial respiration. Administer oxygen. Keep patient quiet and warm. Call physician.

SKIN CONTACT -- drying effect.

Remove contaminated clothing. Wash affected areas thoroughly with soap and water. Apply Nivea cream.

EYE CONTACT

Wash promptly with water for 15 minutes

ETC 00281

F-06344

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VINYL CHLORIDE (CHLOROETHYLENE)

Primary health hazard is associated with excessive respiratory exposure.

Acute over exposure effects central nervous system producing intoxication and dulling of visual and auditory responses (light-headedness, some nausea).

FIRST AID

Inhalation -- Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call physician.

Skin Contact -- Immediately wash with soap and water. Clothing, including shoes, should not be worn again until dry.

Eye Contact -- Immediate irrigation for 15 minutes with water.

ETC 00282

E-06345

Immunizations &
Injections

ETC 00283

F-06346

Allergy Injections

Allergy injections will be administered, by R.N. day nurse to employees if they bring a written request from their private physician including medication and directions.

1. Be familiar with directions that come with vaccine.
2. Inject as prescribed - if in doubt about dose - ask.
3. Inject so that there is enough room above site to place tourniquet.
4. Reactions to watch for:
 - a. Dyspnea, prostration.
 - b. Immediate swelling and erythema at injection site.
 - c. Wheal and flare.
5. Call plant physician for emergency Rx -
6. Record all reactions.
7. Know where these are kept
 - a. Adrenalin
 - b. Tourniquet
 - c. Airway
 - d. Decadron for injection
 - e. Oxygen

Injections and Treatments

F-06347

R.N. on A Shift is to administer all injections to employees that are requested by their private physician. They must bring a written request and medication.

Diathermy and whirlpool treatments for non-occupational conditions will ETC 00284
be given if employee brings a written request from his personal physician.

IMMUNIZATIONS

Immunizations will be provided to employees who by reason of their occupation or job assignments, may be exposed to significant hazards.

Also to employees for vacation travel on request.

Immunizations are not to be given without a plant physician order.

Yellow fever vaccine is given at the Public Health Unit. Yellow fever vaccine and smallpox vaccine must be given on the same day or one month apart.

Smallpox, cholera and yellow fever vaccinations must bear an approved stamp from the health unit. After immunization certificate has been completed and signed by the physician, tell employee to take it to East Baton Rouge Parish Health Unit, 353 North 12th Street, to be stamped. Employees must be familiar with the package inserts prior to use or application of the medication involved.

Information concerning official immunization requirements for international travel may be obtained from East Baton Parish Health Unit. Phone: 343-7411.

Tetanus

1. Active - Primary immunization consists of three 0.5 ml injections of tetanus toxoid absorbed given I.M. The initial, repeated four to six weeks later, and the last, one year later. Routine 0.5 ml boosters should be given every 10 years. For significant "tetanus-prone" wounds, repetition of a booster is the safest course.

2. Passive

Required in absence of active immunization in a wound where the danger of tetanus is great - give tetanus immune globulin - human 250 units intramuscular.

Smallpox

1. Site of preference is region of insertion of deltoid muscle.

E-06348

ETC 00285

Disability Form
Procedures

ETC 00286

F-06349

MEDICAL TREATMENT REPORT

To be filled out for any injury or illness alleged or sustained by employees or non-employees on Company property.

1. Impression -- Both listed impressions on form to be filled in and to be the same. If a physician sees the patient, the 2nd impression on report is to be filled in by him. If nurse only sees patient, fill in both impressions. Shift nurses and R.N.s can record their impressions which are tantamount to an M.D. diagnosis.
2. Physical findings: Descriptive. Give the:
 - a. anatomical location
 - b. size
 - c. appearance
 - d. motion
 - e. restriction of movement, etc.
3. When a physician sees a patient, be sure he is given the chart to record his orders and comments.
4. Do not list allergies on Medical Treatment Report. These are to be listed on outside of charts.
5. Returned Consultation Report is to be clipped to Medical Treatment Report in order received.
6. When Medical Treatments Reports are made on sub-contractor personnel, advise the patient that if he has further difficulty, he should contact his Supervision for possible referral to his Company Physician. Note the fact that he has been notified of this in the remarks section of the Medical Treatment Report.

ETC 00287

Ethyl Corporation

Guide Number: 04-001

Corporate Medical Department

Baton Rouge, Louisiana

Subject: 1. Medical Treatment Report
2. Outpatient Consultation Report

Applies to:

Issued: December 15, 1977

☒ Corporate Activities

Effective: January 1, 1977

☒ Domestic Field Sites

☒ Domestic Affiliates

☐ International

PURPOSE

- . To provide a uniform means of recording and reporting injuries or illnesses which are occupational, pending occupational, or potential liability cases.
- . To provide a uniform means of referring patients for consultation at Company expense.

ACKGROUND

Any injury or illness arising out of or during the course of employment may be an occupational injury or illness. The Industrial Insurance Office decides if the Company is financially responsible for the cost of care.

Medical Treatment Report

The Medical Treatment Report provides a record of essential information on every occupational, pending occupational or potential liability case that is reported to a Site Medical Department. The quality of each Medical Treatment Report is of utmost importance because it is the permanent legal record of the case.

The Medical Treatment Report informs site safety, foreman/supervisor and Industrial Insurance Office (when required) that there has been an incident.

Any injury or illness alleged or sustained by a non-employee on Company property may be the basis for a liability claim against the Company. It is, therefore, imperative that the facts be recorded accurately on a Medical Treatment Report.

ETC 00288

BACKGROUND
(continued)

Outpatient Consultation
Report

The Outpatient Consultation Report is a practical, two-way written communication between the Site Medical Department and a consultant. It maintains Medical Department control of initial and follow-up consultations, provides chronological consultation reports and serves as an audit for consultant fees for service.

FORMS

- Medical Treatment Report
- Outpatient Consultation Report

ORIGINATING OFFICE

- Site Medical Departments

PROCEDURE - MEDICAL TREATMENT
REPORT

Preparation

- Prepare in triplicate for all cases reporting occupational, pending occupational or potential liability conditions. Complete all information requested on form. Ask patient to sign his first person statement. If patient refuses, write "Refused to sign" in place for signature.

Case Number

- Assign case number when lost time, outside expense or permanent disability is involved. Case numbers are provided by Industrial Insurance Office.

Distribution of Copies

Employee Cases

- Original to site employee medical file.
- First carbon to Site Safety Department.
- Second carbon to Supervisor/Foreman of employee.
- Machine copy of original to Industrial Insurance Office when required, i.e. lost time, outside expense, and/or permanent disability.

PROCEDURE - MEDICAL TREATMENT
REPORT (continued)

Contractor Cases

- . Original for Site Medical Department file.
- . First carbon to Site Safety Department when a contractor employee is seen for first aid.
- . Machine copy to contractor.
- . Second carbon destroyed.

Other Non-employee Cases

- . Original for Site Medical Department file.
- . First carbon to Site Safety Department in non-employee cases other than contractor ones.
- . Machine copy to Industrial Insurance Office.
- . Second carbon destroyed.

Progress Notes

- . Enter progress notes on the reverse side of the original.
- . Machine copy for Industrial Insurance Office as necessary to keep them posted of case status.

Discharge Date

- . Record date of discharge from treatment.
- . Send machine copy of discharge summary to Industrial Insurance Office if a copy of the original has been sent to them.

PROCEDURE - OUTPATIENT
CONSULTATION REPORT

Preparation

- . Prepare in triplicate for each visit to a consultant whether for an occupational, pending occupational or non-occupational case at Company expense.
- . Enter case number where applicable.

ETC 00290

PROCEDURE - OUTPATIENT
CONSULTATION REPORT
(continued)

Distribution of Copies

- . Original and two carbons to the consultant.
- . Consultant retains one carbon and returns original and one carbon to Medical.
- . Original to site employee medical file.
- . Carbon to Industrial Insurance Office in occupational or pending occupational cases.
- . Carbon destroyed in non-occupational outpatient consultations.

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ETC 00291

E-06354

ETHYL CORPORATION
MEDICAL DEPARTMENT
MEDICAL TREATMENT REPORT

CASE NO.

S.S. OR EMPLOYEE NUMBER

NAME

OCCUPATION

DEPARTMENT

SUPERVISOR

EXTENSION

HOME ADDRESS

AGE

SEX

☐ MALE

☐ FEMALE

MARITAL STATUS

☐ SINGLE

☐ MARRIED

☐ WIDOWED

☐ DIVORCED

HOME TELEPHONE

ONSET

LOCATION (BUILDING, FLOOR, SECTION, ETC.)

REPORTED TO MEDICAL

DATE

TIME

DATE

TIME

DISPOSITION

☐ REGULAR WORK

☐ MODIFIED

☐ REGULAR WORK

☐ RESTRICTED DUTY

☐ HOME

☐ CONSULTANT

☐ HOSPITAL

☐ OTHER

IF OTHER THAN REGULAR WORK, EXPLAIN:

IF REFERRED TO CONSULTANT OR HOSPITAL, PLEASE RECORD NAME AND ADDRESS:

IMPRESSION:

RETURN FOR ADDITIONAL TREATMENT

☐ NO

☐ YES

DATE

☐ FIRST AID

☐ ETHYL
PHYSICIAN

☐ PENDING

☐ LOST
TIME

☐ OTHER

SIGNATURE OF MEDICAL ATTENDANT

DISCHARGE DATE

DATES COPIES SENT TO INDUSTRIAL INSURANCE OFFICE

HISTORY OF COMPLAINTS (IN PATIENT'S OWN WORDS - WHAT, HOW, WHY)

EMPLOYEE'S SIGNATURE

PHYSICAL FINDINGS:

X-RAY DATES

IMPRESSION:

TREATMENT:

INJECTION
TETANUS
TOXOID

☐

HUMAN
GLOBULIN

☐

☐ NO

REMARKS:

ETC 00292

SIGNATURE OF MEDICAL ATTENDANT

MEDICAL DEPARTMENT COPY

E-06355

ETHYL CORPORATION
MEDICAL DEPARTMENT
OUTPATIENT CONSULTATION REPORT

CASE NO.

TO: NAME

ADDRESS

RE: EMPLOYEE'S NAME

ADDRESS

OUR EMPLOYEE IS REFERRED TO YOU FOR

☐ DIAGNOSIS ONLY

☐ DIAGNOSIS AND TREATMENT

DATE:

S.S. OR EMPLOYEE NUMBER

FOR COMPLAINTS REFERABLE TO:

M. D.

CONSULTANT: IN ADDITION TO A COMPLETE REPORT PLEASE RENDER THIS SUMMARY REPORT BELOW IMMEDIATELY.

HISTORY

FINDINGS

DIAGNOSIS

TREATMENT

RECOMMENDATIONS (CHECK WHERE APPLICABLE—DETAILS UNDER REMARKS)

- ☐ X-RAYS TO BE TAKEN AT ETHYL CORPORATION WHEN POSSIBLE (SPECIFY)
☐ PHYSIOTHERAPY TO BE GIVEN AT ETHYL CORPORATION WHEN POSSIBLE (SPECIFY)
☐ TO RETURN TO ETHYL CORPORATION FOR FURTHER CARE
☐ TO RETURN TO MY (OFFICE) (HOSPITAL) FOR FURTHER CARE

DATE

TIME

DISPOSITION

- ☐ MAY RETURN TO REGULAR WORK
☐ MAY RETURN TO LIMITED WORK (SPECIFY)
☐ HOME UNTIL _____ (APPROXIMATE DATE)
☐ ADMITTED TO _____ (HOSPITAL)
☐ OTHER (EXPLAIN)

DATE

M. D.

REMARKS:

E-06356

NOTE:

1. Ethyl will be responsible for payment only when each outpatient visit is authorized by this form.
2. You may retain the third copy of this report - please return the first two copies with the patient. If the patient is sent home or hospitalized please return the first two copies to us by mail and telephone the Medical Department.
3. Reports and bills should be submitted in duplicate to the Ethyl Medical Department

ETC 00293

MEDICAL PROGRESS RECORD

1. Do not put "See Lead Card," or list work-related injuries on Medical Progress Record.
2. Skip one line when recording on Medical Progress Record if patient has been returned after P.I. (line is to be used for recording certification).

E-06357

ETC 00294

Ethyl Corporati.

Corporate Medical Department

Baton Rouge, Louisiana

Applies to:

☒ Corporate Activities

☒ Domestic Field Sites

☒ Domestic Affiliates

☐ International

Guide Number: 04-002

Subject: Medical Progress Record

Issued: January 5, 1978

Effective: January 15, 1978

PURPOSE

To provide a uniform permanent individual employee record on non-occupational clinic visits, absences due to illness and other pertinent medical information.

BACKGROUND

Separation of non-occupational personal medical information helps preserve the individual employee's right to privacy for personal medical matters.

FORMS

Medical Progress Record

ORIGINATING OFFICE

Site Medical Departments

PREPARATION

An entry should be made by the medical attendant for each visit to the Medical Department which is not recorded on an Occupational Treatment Report. Each entry should be made in ink or typed and signed with attendant's initials and last name.

DISTRIBUTION

One copy only in employee's individual medical file.

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F-06358

ETC 00295

MEDICAL PROGRESS RECORD

S.S. OR EMPLOYEE NUMBER

NAME

REMARKS:

F-06359

S.S. OR EMPLOYEE NUMBER

MEDICAL DIRECTIVES AND NURSING PROCEDURES

Employee reported off with occupational or pending occupational injury:

- a. Guard will bring 196 from Main Gate
- b. Notify plant physician.
- c. Make entry on Medical Treatment Report - "196 received from Main Gate," reported Home Comp (or Pending Home Comp.) as of date and shift. Leave retreat column open.
- d. Attach 196 to Medical Treatment Report and leave for R.N. day nurse.
- e. Do not put on breakdown.

ABSENT EMPLOYEE REPORT				CALL OR NOTICE RECEIVED DATE:		TIME	
NAME			BADGE NUMBER		SECTION		
ADDRESS							
PHONE NO.		FIRST SCHEDULED SHIFT YOU EXPECT TO MISS SHIFT: DATE:					
REASON GIVEN FOR ABSENCE							
☐ Personal Illness ☐ Off-the-job Injury ☒ On-the-job Injury		ATTENDING PHYSICIAN		HOSPITAL			
☐ Death in Family		NAME OF DECEASED		RELATIONSHIP			
		FUNERAL HOME		BURIAL PLACE (CITY & STATE)		DATE TIME AM PM	
☐ Illness in Family		NAME OF PERSON ILL		RELATIONSHIP			
☐ Personal Business* ☐ Jury Duty ☐ Union Business ☐ Witness ☐ Election Commissioner ☐ Other*		*EXPLAIN: _____ _____ _____					
NAME OF FOREMAN/SUPERVISOR		MAIN GATE NOTIFIED BY		FOREMAN OR SUPERVISOR NOTIFIED			
				NAME		DATE TIME AM PM	
☐ Full Information not Available		SIGNATURE OF PERSON PREPARING REPORT					

Excusing for Personal Illness

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Procedure to follow when employee is excused for personal illness regardless if working regular shift or overtime shift:

1. Record on blue dispensary card
 - a. Symptoms - reason for excusing
 - b. Vital signs
 - c. Private physician, if patient plans to see one
 - d. Give a date to report to Plant Medical if not back to work (use your judgment, take into consideration severity of illness, scheduled days off, etc.).
2. Make three Medical Service Slips
 - a. One you keep and attach to blue card.
 - b. Give two to patient with instructions to give one to his foreman and one to the guard as he leaves.
3. Tell to make absentee at gate.
4. Ask if he needs transportation and if so
 - a. Call Main Gate and request they take employee home - give name, badge number and address.
 - b. Have employee report to Gate for transportation if able - if not, have guard pick him up at Medical.
5. If employee is acutely ill
 - a. Call private physician.
 - b. If to be sent to hospital, ask what mode of transportation.
 - c. If to go to hospital via ambulance
 1. Call ambulance service.
 2. Notify Main Gate ambulance is coming in.
 3. Notify foreman, ask him to send someone to get employee's street clothes.
 4. Make calls for employee regarding getting his car home - guards are not allowed to take employee's car home.

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Excusing For Personal Illness

- d. If can go in car to hospital or doctor's office
1. Call Main Gate for car
 2. Instruct employee he will be left by guard and must arrange his own transportation from there.

DUTY RELEASE/RETURN

This certificate to be presented to Foreman/Supervisor by employee

AME		S.S. OR EMPLOYEE NO		DATE	
RELEASE FROM DUTY	DATE	SENT TO		SUPERVISOR NOTIFIED (NAME)	☐ OCCUPATIONAL ☒ PERSONAL ☒ ILLNESS ☐ INJURY
	TIME AM PM	☒ HOME ☐ HOSPITAL ☐ PERSONAL PHYSICIAN			
RETURN TO DUTY	☐ FIT FOR REGULAR WORK ☐ MODIFIED REGULAR WORK ☐ RESTRICTED DUTY UNTIL _____ DATE				
	TEMPORARY DUTIES SHOULD NOT INCLUDE THE FOLLOWING				
	☐ CLIMBING STAIRS OR LADDERS ☐ WORK ABOVE FLOOR OR GROUND LEVEL ☐ WORK AROUND MOVING MACHINERY ☐ DRIVE COMPANY VEHICLE ☐ LIFT, PUSH, PULL OVER LBS. ☐ SHIFT WORK ☐ OVER TIME		EXPOSURE TO ☐ COLD ☐ VCM ☐ HEAT ☐ SOLVENTS ☐ WATER ☐ NOISE ☐ DAMPNESS ☐ DUST/FUMES ☐ LEAD ☐ OTHER		☐ WALKING OR STANDING OVER _____ % OF TIME ☐ KNEELING OVER _____ % OF TIME ☐ BENDING _____ % OF TIME ☐ EYE HAZARDOUS WORK ☐ USE OF _____ ☐ OTHER _____
	Employee on temporary work assignment should return to Medical for further classification when specified time has elapsed.				
REMARKS	FIRST DAY DISABILITY _____ FIRST DAY ABLE TO RESUME DUTIES _____ SHIFT _____ <i>Excused Personal Illness</i>				
CM 7803	SIGNATURE _____				

E-06362

ETC 00299

PROCEDURE FOR HANDLING RETURN TO WORK

A. After Personal Illness

1. Check list in dispensary of patients not to be returned without seeing plant physician - if on this list, do not return patient to work - hold for doctor; if on weekend, tell patient to report when doctor is in.
2. Do not issue a return to work slip in advance. Must be issued during shift employee is working on the day he returns. May be any time during that shift, but is preferred that he get it at the start of the shift.
3. Do not issue return to work slip if patient is back to work and forgot to get slip on day he returned, but leave note in disability wage box in dispensary with the following information:
 - a. Name
 - b. Badge Number
 - c. Nature of Illness
 - d. If private physician was seen, give name.
 - e. Date and shift he returned.
4. Only issue return to work slips for personal illness, NOT illness in family, personal business, etc.
5. Employee must appear in person to get return to work slip - do not send through the mail.
6. Procedure to follow in issuing slip
 - a. Obtain badge number
 - b. Check Medical Progress Record & Medical Treatment Report for duty status.
 - c. Make two medical service slips, one for the patient to take to his foreman and one for disability wage box in dispensary with the following information stapled to it on a separate piece of paper.
 1. Date
 2. Time In
 3. Badge Number
 4. Patient's Name

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ETC 00300

Procedure for handling return to work - (continued)

5. Nature of personal illness, question thoroughly.
Be specific.
6. If private physician was seen, give name.
7. Your name.
7. If employee has been off personal illness with a heart condition, surgery or long term illness or if questionable as to ability to work, hold for Plant Physician or doctor's assistant. If on shift, call Plant Physician.

DUTY RELEASE/RETURN

This certificate to be presented to Foreman/Supervisor by employee

NAME		S.S. OR EMPLOYEE NO		DATE	
RELEASE FROM DUTY	DATE	SENT TO ☐ HOME ☐ HOSPITAL ☐ PERSONAL PHYSICIAN		SUPERVISOR NOTIFIED (NAME)	☐ OCCUPATIONAL ☒ PERSONAL ☐ ILLNESS ☐ INJURY
	TIME AM PM				
RETURN TO DUTY	☒ FIT FOR REGULAR WORK ☐ MODIFIED REGULAR WORK ☐ RESTRICTED DUTY UNTIL _____ DATE				
	TEMPORARY DUTIES SHOULD NOT INCLUDE THE FOLLOWING				
	☐ CLIMBING STAIRS OR LADDERS ☐ WORK ABOVE FLOOR OR GROUND LEVEL ☐ WORK AROUND MOVING MACHINERY ☐ DRIVE COMPANY VEHICLE ☐ LIFT, PUSH, PULL OVER _____ LBS ☐ SHIFT WORK ☐ OVER TIME		EXPOSURE TO ☐ COLD ☐ VCM ☐ HEAT ☐ SOLVENTS ☐ WATER ☐ NOISE ☐ DAMPNESS ☐ DUST/FUMES ☐ LEAD ☐ OTHER _____ _____		
	☐ WALKING OR STANDING OVER _____ % OF TIME ☐ KNEELING OVER _____ % OF TIME ☐ BENDING _____ % OF TIME ☐ EYE HAZARDOUS WORK ☐ USE OF _____ ☐ OTHER _____				
<i>Employee on temporary work assignment should return to Medical for further classification when specified time has elapsed.</i>					
FIRST DAY DISABILITY		FIRST DAY ABLE TO RESUME DUTIES		SHIFT	
REMARKS SIGNATURE _____					

E-06364

ETC 00301

Excusing from Overtime

If employee has a valid medical reason

1. Write on blue card requested to be excused overtime shift today, reason and granted.
2. Make one Medical Service Slip and give to employee to take to his foreman with date and time. Under explanation, put "No overtime today only." Check under duty status column "other" and put advisory.
3. Put on shift performance sheet under "Subcontractor," badge number, name and granted.

If employee does not have a valid medical reason, follow same procedure as above.

EXCEPT

1. Tell him you cannot excuse him.
2. Write on blue card reason not granted.
3. Make Medical Service Slip and give to employee for foreman. Under explanation put, "Insufficient medical evidence to advise against overtime."
4. Put on shift performance sheet, "Refused."

Employee is to be excused from overtime prior to overtime shift only.

DECISION ON EXCUSING FROM OVERTIME TO BE MADE BY PLANT PHYSICIANS ONLY.

DUTY RELEASE/RETURN
This certificate to be presented to Foreman/Supervisor by employee

NAME _____		S.S. OR EMPLOYEE NO _____		DATE <u>Plus Time</u>	
EASE FROM DUTY	DATE _____	SENT TO	SUPERVISOR NOTIFIED	☐ OCCUPATIONAL ☐ PERSONAL ☐ ILLNESS ☐ INJURY	
	TIME _____ AM _____ PM _____	☐ HOME ☐ HOSPITAL ☐ PERSONAL PHYSICIAN	_____ (NAME)		
RETURN TO DUTY	☐ FIT FOR REGULAR WORK ☐ MODIFIED REGULAR WORK ☐ RESTRICTED DUTY UNTIL _____ DATE _____				
	TEMPORARY DUTIES SHOULD NOT INCLUDE THE FOLLOWING				
	☐ CLIMBING STAIRS OR LADDERS ☐ WORK ABOVE FLOOR OR GROUND LEVEL ☐ WORK AROUND MOVING MACHINERY ☐ DRIVE COMPANY VEHICLE ☐ LIFT, PUSH, PULL OVER _____ LBS ☐ SHIFT WORK ☐ OVER TIME		EXPOSURE TO ☐ COLD ☐ VCM ☐ HEAT ☐ SOLVENTS ☐ WATER ☐ NOISE ☐ DAMPNESS ☐ DUST/FUMES ☐ LEAD ☐ OTHER _____ _____ _____		
	☐ WALKING OR STANDING OVER _____ % OF TIME ☐ KNEELING OVER _____ % OF TIME ☐ BENDING _____ % OF TIME ☐ EYE HAZARDOUS WORK ☐ USE OF _____ _____ ☐ OTHER _____				
	Employee on temporary work assignment should return to Medical for further classification when specified time has elapsed FIRST DAY DISABILITY _____ FIRST DAY ABLE TO RESUME DUTIES _____ SHIFT _____				
REMARKS	<i>advising insufficient medical evidence to advise against overtime</i>				
CM 7803	SIGNATURE _____				

DUTY RELEASE/RETURN
This certificate to be presented to Foreman/Supervisor by employee

NAME _____		S.S. OR EMPLOYEE NO _____		DATE <u>Plus Time</u>	
RELEASE FROM DUTY	DATE _____	SENT TO	SUPERVISOR NOTIFIED	☐ OCCUPATIONAL ☐ PERSONAL ☐ ILLNESS ☐ INJURY	
	TIME _____ AM _____ PM _____	☐ HOME ☐ HOSPITAL ☐ PERSONAL PHYSICIAN	_____ (NAME)		
RETURN TO DUTY	☐ FIT FOR REGULAR WORK ☐ MODIFIED REGULAR WORK ☐ RESTRICTED DUTY UNTIL _____ DATE _____				
	TEMPORARY DUTIES SHOULD NOT INCLUDE THE FOLLOWING				
	☐ CLIMBING STAIRS OR LADDERS ☐ WORK ABOVE FLOOR OR GROUND LEVEL ☐ WORK AROUND MOVING MACHINERY ☐ DRIVE COMPANY VEHICLE ☐ LIFT, PUSH, PULL OVER _____ LBS ☐ SHIFT WORK ☐ OVER TIME		EXPOSURE TO ☐ COLD ☐ VCM ☐ HEAT ☐ SOLVENTS ☐ WATER ☐ NOISE ☐ DAMPNESS ☐ DUST/FUMES ☐ LEAD ☐ OTHER _____ _____ _____		
	☐ WALKING OR STANDING OVER _____ % OF TIME ☐ KNEELING OVER _____ % OF TIME ☐ BENDING _____ % OF TIME ☐ EYE HAZARDOUS WORK ☐ USE OF _____ _____ ☐ OTHER _____				
	Employee on temporary work assignment should return to Medical for further classification when specified time has elapsed FIRST DAY DISABILITY _____ FIRST DAY ABLE TO RESUME DUTIES _____ SHIFT _____				
REMARKS	<i>advising No overtime today only</i>				
CM 7803	SIGNATURE _____				

E-06366

ETC 00303

PROCEDURE TO FOLLOW IF NECESSARY TO SEND EMPLOYEE WITH
OCC INJURY TO A PHYSICIAN IN TOWN ON SHIFT

- 1) Call plant physician,
- 2) Call Main Gate for car - if patient will be gone for a short time,
have guard wait for him; if it's going to be longer, have guards return
and tell patient to call Medical when he is ready to return.
- 3) Give Outpatient Consultation Report to patient for doctor.
- 4) On MTR* write up and on shift performance sheet put doctor
contacted and time, time and place sent and how sent.
- 5) Be sure to note on MTR* if consult report was sent to doctor
and if patient returns with Consult Report filled in by doctor, attach
with paper clip to MTR* and leave in tray for Charge Nurse.
- 6) If patient is admitted to hospital or told by doctor not to return to work notify
plant physician and patient's foreman. Have patient report off occ. at
gate.

If admitted to hospital, tell him to notify plant medical when discharged.
Be sure he understands that fee will be paid by Industrial Insurance except for extra
telephone, television or other personal items and to deliver all bills forwarded
to him to Plant Medical.

If prescription is given patient, have him fill it at drug store and bill to
Ethyl or pay for it and he will be reimbursed - Bring bill to Plant Medical.

*MTR -- Medical Treatment Report

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Partial Duty

When plant physician is in Medical Department assignment or approval of assignment shall be exercised by the physician. On "A" shift reviewing shall be done by registered nurses only. At all other times, the decision may be made by the nurse on duty. The record should always specify clearly the reason for the partial duty and the stipulations of such duty should be itemized separately - as example:

Recommend the following Partial Duty

1. No heavy lifting - 50 lbs. maximum
2. No climbing other than ordinary stairs
3. Review (date _____)

On every occasion that an employee with partial duty is seen in the dispensary, check review date.

On each case, determine that the partial duty restrictions are necessary, are desired by the employee and are no more restrictive and of no longer duration than absolutely necessary.

Do not issue partial duty to an employee requesting permission to shower early for medical reasons, even though he may have a written request from his personal physician. Refer him to his supervision.

RETURNING TO PARTIAL DUTY AFTER PERSONAL ILLNESS

Find out what partial duty needed and for how long.

Call shift foreman, outline partial duty needed and time required.

If partial duty available

Make three Duty Release/Return slips.

Example: OK for partial duty after personal illness

- 1) Limited use right hand
- 2) Review date (tell employee to be sure and report for review on date listed).

Duty Release/Return slips go to the following.:

- 1) Patient (to take to his foreman).
- 2) Overtime clerks box in dispensary.
- 3) Wage Disability box in dispensary.

On Med. Progress record record condition requiring partial duty, name of foreman called and can use on the following partial duty.

Example: OK for partial duty after personal illness.

- 1) List restrictions
- 2) Review date

Stamp with partial duty red stamp

Return card to active partial duty file.

If no partial duty available

1. Have patient return home
2. Tell him date to report to Plant Medical
3. Make note and put in disability wage box - time in, condition requiring

E-06363

ETC 00306

partial duty, what shift suppose to work, if private physician was seen, foreman called (his name) and could not use on the following partial duty, list restrictions requested and date told to report.

DUTY RELEASE/RETURN
This certificate to be presented to Foreman/Supervisor by employee

NAME _____		SS OR EMPLOYEE NO _____		DATE _____	
RELEASE FROM DUTY	DATE _____	SENT TO ☐ HOME ☐ HOSPITAL ☐ PERSONAL PHYSICIAN		SUPERVISOR NOTIFIED _____ (NAME)	
	TIME _____ AM _____ PM				
☐ FIT FOR REGULAR WORK PARTIAL DUTY ☐ MODIFIED REGULAR WORK ☒ RESTRICTED DUTY UNTIL _____ DATE					
TEMPORARY DUTIES SHOULD NOT INCLUDE THE FOLLOWING					
RETURN TO DUTY	☐ CLIMBING STAIRS OR LADDERS ☐ WORK ABOVE FLOOR OR GROUND LEVEL ☐ WORK AROUND MOVING MACHINERY ☐ DRIVE COMPANY VEHICLE ☒ LIFT, PUSH, PULL OVER <u>35</u> LBS. ☐ SHIFT WORK ☐ OVER TIME		EXPOSURE TO ☐ COLD ☐ HEAT ☐ WATER ☐ DAMPNESS ☐ LEAD ☐ VCM ☐ SOLVENTS ☐ NOISE ☐ DUST/FUMES ☐ OTHER		☐ WALKING OR STANDING OVER _____ % OF TIME ☐ KNEELING OVER _____ % OF TIME ☐ BENDING _____ % OF TIME ☐ EYE HAZARDOUS WORK ☐ USE OF _____ ☐ OTHER _____
	Employee on temporary work assignment should return to Medical for further classification when specified time has elapsed.				
FIRST DAY DISABILITY _____		FIRST DAY ABLE TO RESUME DUTIES _____		SHIFT _____	
REMARKS _____ _____ _____					
CM 7803 _____					

E-06370
ETC 00307

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RETURNING TO DUTY AFTER WORK-RELATED ABSENCE

If there are no slips on patient's chart or on spindle in dispensary and no write-up on Medical Treatment Report saying patient can return, call physician on call for permission to return patient.

- 1) If medical service slips are on chart or spindle - give one to patient, one in disability wage box and one in overtime clerks box if on partial duty.
- 2) On Medical Treatment Report put date and time returned list OK for full duty after Occ. Abs. as of date and shift (tell patient) and put date to report in.
- 3) File Medical Treatment Report in active file if retreat date is given.

If injury is finalized at same time, OK injury of date, final and file back in patient's chart.

WHEN NOT TO ISSUE EXCUSE PERSONAL ILLNESS SLIP

- 1) If patient comes in at start of shift and has not started on job (even though he may have changed to work clothes and requests to be excused for personal illness - DO NOT ISSUE EXCUSE SLIP.
 - a) First explain to him he does not need slip since he has not started work, even though he may have clocked in already.
 - b) Pull MPR. Record request to be excused, why not necessary to issue slips - nature of illness, if plans to (continued next page)

see M.D., tell and record date to report in, file back in chart.

- c) Tell patient to report of personal illness at gate.
- d) Make note for disability office and put in box in dispensary with same information you put on blue card as time, date, shift expected to miss, nature of illness, M.D., date to report to Plant Medical.

2. If an employee has worked 24 consecutive hours and is unable to work his regularly scheduled shift because of fatigue, do not excuse personal illness. He is to be excused, if he so desires, by his foreman (Code 90).

F-06372

ETC 00309

Appointment with outside physician for occupational injury
during working hours -

- 1) Patient is to notify R.N. day nurse and foreman in advance.
- 2) Tell foreman to carry his time as visit to Plant Medical.
- 3) Provide transportation if needed (may use his car if he wishes).
- 4) Issue one Medical Service slip for guard "allow to pass".
- 5) Have patient report to Medical when he returns.

Consultations

Plant physician will order consultation. Day nurse R.N. will make appointment and fill out consult form and give to patient. Explain to patient fee will be paid by Plant Medical for consultation only - not treatment.

Records

Control Drugs

Record in book in dispensary all control drugs dispensed.

Crutches, Canes

Record in book in dispensary - may be issued for occupational and non-occupational conditions.

Treatments of Construction Workers, Visitors, etc.

Record in book in dispensary: Name, time in, condition, treatment given.

Fill out a Medical Treatment Report ~~to~~^{for} any injury or illness alleged or sustained by a non-employee on Company property.

Rules for Non-Occupational Disability

For the proper administration of the Accident and Sickness Benefit Plan, employees must comply with the following rules in order to be considered for benefits.

1. Report absence to the Main Gate as soon as is known will not be at work on next regularly scheduled shift.
2. If employee becomes ill at work, must check out through Medical and report absence to the Main Gate.
3. Report in person to Plant Medical the first day disability does not confine you to home or hospital unless otherwise instructed by Plant Medical. Reporting days are Monday through Friday, excluding Holidays, between the hours of 7:30 a.m. and 4:00 p.m.
4. Report any change of address during your disability to Plant Medical.
5. Notify Plant Medical of admittance to hospital.
6. Report to Plant Medical and receive a back-to-work slip on day you return to work.
7. If you are absent due to disability and are able to return to work, you must report in person to Plant Medical for a return to work slip before going on vacation, jury duty, etc.
8. Prearranged appointments for non-routine medical treatments, surgical procedures, emergency dental work and diagnostic procedures where actual disability does not exist must be scheduled outside of working hours. Disability benefits are not paid for routine, previously arranged medical and dental appointments.

E-06374

ETC 00311

Instructions to Nurses

1. Employees who must be returned by Physician or Assistant to Physician-put time in, name and badge number on Form 1332 (Disability Daily Sheet) and have employee wait in waiting room if they report before disability office is open.
2. Do not take information if employee reports to Medical on weekends, holidays, or when disability office is closed. Instruct them to report at the proper time.
3. When employees off on disability report to dispensary desk on "A" shift during week days, question if off on personal illness or occupational. If personal illness, refer to disability wage office. If clerk is not in the office, pull card and record time on daily sheet and place card in door box.
4. Information on the Disability Wage Cards must be kept strictly confidential. Foremen or other members of supervision are to be given only the estimated date of return or date patient is expected to report to Medical.

Disability wage
Office

F-06376

ETC 00313

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Work Schedule for Disability
Wage Office.

1. Pick up from Dispensary first thing each morning the following:
 - A. Medical Service Slips (Return to Work Slips)
 - B. Slips marked O.K. from Occupational Condition - These are sent to the Industrial Insurance office.
 - C. Dispensary Cards (Blue Cards) of employees who were excused because of Personal Illness.
 - D. Name sheet for employees waiting to see Disability Wage interviewer.
 - E. Pull "Daily Breakdown Report" from bulletin board.
2. In Disability Wage Office:
 - A. Pull Employee Disability card (White Card) who's name appears on name sheet and process for Disability Wage Interviewer to see.
 - B. Check Form 196 (Absence Report). All reports on management and confidentialia employees are set aside to be pick-up by Personnel after absence is typed on Employee Disability card.
 - C. Match up Form 196 with Employee Disability Card and return to work slip and Dispensary Record Card; then the Return to Work Slip with the Employee Disability Card from the active file.
 - (1) On Employee Disability card taken from active file type in RED:
 - (a) Current date.
 - (b) In caps: RETURN TO (the appropriate date (ie: FULL DUTY, PARTIAL DUTY or MODIFIED REGULAR WORK) and the date patient returned to work. Then any note from Dispensary, giving reason for being off. Make note of any comment made by patient's personal physician if he saw one. Then enter the initials of the person who initiated the Return to Work Slip followed by your initials in the right hand margin of the Disability Card. (All this is typed in red.)
 - (c) If Disability Wage Interviewer returns an employee to work this shift, this report is typed in black, noting the date, time in, followed by the report, followed on the same line in RED caps: RETURN TO (appropriate duty) as checked. If duty is Partial Duty issue slip to Dispensary for entry on patient's Dispensary card.

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ETC 00314

Work Schedule for Disability Wage Office (continued)

3. After all returns have been typed, go to master board and block out square in orange denoting that patient has returned to work and make a check mark opposite the day of the month returned. On the right side of the sheet, put the number of days missed. (This is applicable only to the current working month.)
4. File the Disability Wage cards back in the inactive file. (In badge number order)
5. Match up new 196's with the Disability Cards which have been pulled from the inactive files. Check address, phone number, work section and update the white card as indicated.
 - A. Skip one line between last illness. Type in RED - the current date and: ABS. REPT, date, FDD, date, Dr's name and notified by whom. If in hospital, so note and which one.
 - B. Place on Master board under section employee works; earliest FDD first. Then file all white cards in active file.
6. As patient reports to see the Disability Wage Interviewer, pull white card from active file, enter on Name Sheet and process for Interviewer. After Interviewer sees patient, type the write-up in black and if patient is given a slip to return to work at this time, notify the appropriate supervision of this fact.

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ETC 00315

Duties
al Assistant

F-06379

ETC 00316

MEDICAL ASSISTANT'S DUTIES

1. Collection and recording of certain information and collection of sample associated with lead check procedure.
- 2.
3. Operate electrocardiograph and take EKG.
4. Operate audiometer and take audiograms.
5. Operate sight screening apparatus.
6. Perform tonometry.
7. Assist in Disability Wage Office.
8. Process personnel for periodic or pre-placement examinations.
9. Collect and prepare specimens for transmittal to medical laboratory.
10. Assist physicians in the preparation for examination of individuals.
11. Calibrate audiometer once a week.

F-06380

ETC 00317

INSTRUCTIONS TO MEDICAL ASSISTANT

PREPLACEMENT AND PERIODIC EXAMINATIONS

- Height - to be recorded to nearest one-half inch. Height for men recorded with shoes on. Women wearing high heeled shoes should remove the shoes before height is taken.
- Weight - to be recorded to nearest pound. Weight is taken with usual indoor clothing (including shoes); men remove coat.
- Temperature - to be recorded in degrees Fahrenheit to nearest one-tenth degree. Thermometer under tongue for 3 minutes (use timer).
- Pulse - to be recorded in beats per minute.
- Blood Pressure - to be recorded in mm Hg. using mercury gravity manometer for determination. Patient to be supine with the forearm at heart level (if sitting or other position, so specify). Inflate cuff of sphygmomanometer to about 30 mm Hg. above point at which the radial pulse disappears, then release pressure at rate 2 - 3 mm Hg./sec. (not faster or slower than this!). The stethoscope head should be applied firmly (but without unnecessary pressure) to the antecubital space over the previously palpated brachial artery. The systolic pressure should be recorded as that level at which the initial tapping sound is heard through the stethoscope for at least two consecutive beats. The diastolic pressure should be recorded as that level at which distinct, abrupt muffling (or sudden disappearance) of the sounds occur. Where a very wide range (greater than 5 mm Hg.) between muffling of sounds and disappearance of sounds, record both (e.g. sounds appear at 140, muffling at 90, disappearance at 40 - record B.P. as 140/90-40).
- Vision - to be tested by use of A-O Sight Screener and Ishihara color plates (using Macbeth Easel Lamp for illumination). Vision without glasses is to be recorded in black, vision with glasses is to be recorded in red. Persons wearing contact lenses are to be tested with lenses in place (i.e., do not ask them to remove lenses for testing without correction).
- Hearing - is to be tested with subject in soundproof booth using Rudmose ARJ-4A Automatic Recording Audiometer. Audiometer must be calibrated once a week and calibration proof retained in file. Record nature, duration and time of last noise exposure on back of audiogram card.
- Intra-ocular pressure - is to be recorded in mm.Hg., patient supine, using certified Schiötz tonometer. Identify pressure in right eye by "O.D.", left eye "O.S.".

F-06381

ETC 00318

Instructions to Medical Assistant (Continued)

Electrocardiogram - standard 12-lead tracing to be made with patient supine.

Urine analysis - dipstick for pH, protein, glucose, ketones, bilirubin and blood (Bili-Labstix), record results. Label specimen with date, badge number of subject and area ("25"), attach analysis slip (similarly marked plus check off "spot", write "Routine" under "Remarks"), send to R & D laboratory with specimens going from Lead office each day.

Blood - one small purple-top (EDTA) tube (mix well; refrigerate) and one small red-top tube with at least 5 ml serum (obtain by collecting blood in a large red-top tube, let it clot, "ring" clot, spin down in centrifuge, draw off serum; refrigerate); each labelled with date, subject's name, "Ethyl Corp." - send to Pathology Laboratory with completed request slip. Also collect one large brown-top tube (mix well), label with date, badge number, area ("25") - attach analysis slip (marked as for urine except check off "Blood"), send to R & D laboratory with specimens going from lead office each day.

Chest X-ray - EPA of chest on 14 x 17 film at 72 inches distance.

F-06382

ETC 00319

Records (By Medical Assistant)

- I. EKG book
 - a. Date
 - b. Employee's name
 - c. Badge number
 - d. EKG number
- II. LAB work request book
 - a. Date
 - b. Employee's name
 - c. Badge number
 - d. LAB work done-Ethyl Standard and other
 - e. Whether repeat
- III. Periodic physical examination schedule
 - a. Badge number
 - b. Employee's name
 - c. Section
 - d. Time of appointment
 - e. Check tests done
 - f. If does not report - reason.

F-06383

ETC 00320

PERIODIC EXAMINATIONS

A. Receive Schedule for next week's exams every Friday afternoon

1. Check eligibility for exam (date of last periodic -- at least three years service, at least three years since last exam and not examined since date current cycle began).
2. Notify master scheduler (Personnel) if ineligible, accept replacement for assigned slot if available from group scheduler that same day.

B. Exam Sequence

1. Afternoon before pull all charts
Pull audiogram master card
Fill in all information available on forms, as patient's name, age, badge number
Get blood tubes ready
 - 1 - 20 ml Brown top - # Badge Number
 - 1 - 10 ml Red top - #Badge Number
 - 1 - 7 ml Red top - name, date, badge number
 - 1 - 7 ml Purple top - name, date, badge number
2. Weight
3. Height
4. Temperature
5. Pulse
6. Blood Pressure
7. Eye test
8. Audiogram
9. EKG
10. Blood Sample - Fasting
11. Tonometry (over 40)
12. Chest X-ray
13. Urine sample
14. Have patient fill out questionnaire
15. Make M.D. appointment and give appointment slip
16. Mount EKG

} While temperature being taken

F-06384

ETC 00321

17. Process blood
18. Urine sample (dip stick and record) attach request slip and send to R & D for 1.
LEAG
19. Attach request slips to blood
20. Charts to M.D. for EKG reading (remove all EKG' from chart with most recent in front, attache to chart plus yellow sheet)

C. When available

1. File reports in charts, stapled together in following order
 - a. yellow physical sheet (put results of urine dip stick)
 - b. X-ray report
 - c. SMA
 - d. Eye chart
 - e. Audiogram
 - f. CBC
 - g. lead result
2. File questionnaire in chart (put after reports)
3. Refile charts in dispensary
(if review within one week - keep charts in file in lab)

D. Afternoon before M.D. appointment

1. Pull chart
2. Attach slip to folder showing date and time of appointment with M.D.

E. Patient in for M.D. appointment

1. MALE - Put in examining room - have undress
FEMALE - Remain dressed
2. Put chart in door box
3. Notify M.D.

When SMA reports return if any abnormalities, make appointment for repeat.

Eligibility for physical - must not have had any type physical, periodic, or preplacement since 1968.

F-06385

ETC 00322

Electrocardiograph Procedure

1. Have patient lie on table with shirt, shoes and watch removed.
2. Make certain patient is in a position of comfort with arms supported so total relaxation is possible. Muscular tremor is not acceptable.
3. Make strips long enough for mounting, but not longer.
4. Mount EKGs and record required data on folder.
5. Make copies of all EKGs daily, send original plus consultation order to Dr. David W. Wall, 3849 North Boulevard, for interpretation.
6. On yellow Medical Examination sheet record, in pencil, date and EKGs sent to Dr. Wall.
7. File copies in patient's chart.
8. When original is returned, record interpretation on Medical Exam sheet, erase penciled date sent, destroy copies and place original in patient's chart in proper order.

E-06386

ETC 00323

Laboratory Procedure

Two Hour Glucose Tolerance Test

1. Nothing to eat after midnight.
2. At 7:30 A.M. draw a fasting blood sample.
3. Instruct patient to empty his bladder.
4. Have patient drink a bottle of Glucola. Note the time.
5. Two hours later, draw blood sample for sugar and obtain a urine specimen.
6. The urine specimen is to be tested for glucose with dipstick and results recorded.
7. The blood specimen to be sent to Pathology Laboratory.

8-06387

ETC 00324

Cleaning Tonometer

1. Wash tip of tonometer in water after each time used and place in sterilizer.
2. At the end of the day, take weight off and clean each part separately in water and place in sterilizer.
3. Once a week take apart and clean with alcohol.

F-06388

ETC 00325

Charts
Anatomical

F-06389

ETC 00326

SIMPLIFIED GUIDE OF ANATOMICAL CHARTS

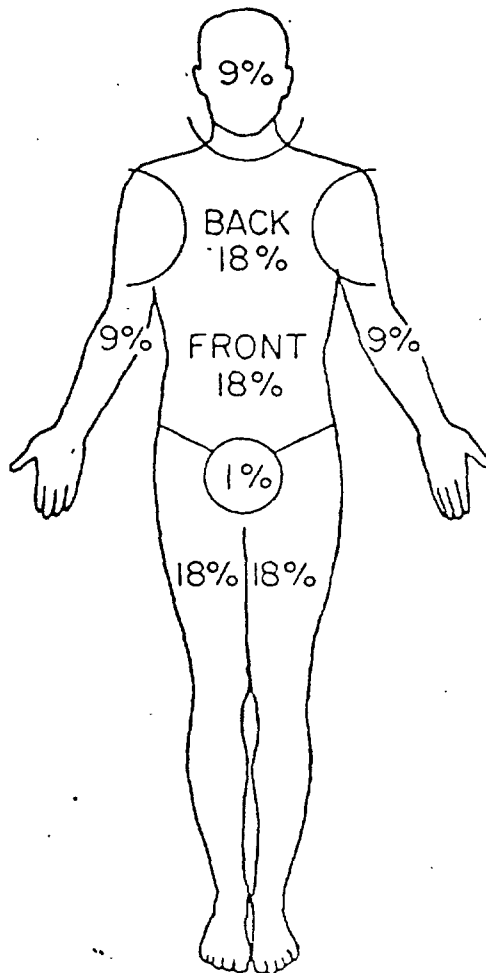
The main objective of this guide is to assist the nurse in describing areas of injury or complaints in SIMPLIFIED, BRIEF, AND CONCISE terminology. Highly technical and detailed anatomical areas of the skeletal, musculature, and circulatory systems can be easily obtained from many available sources, and have been purposely omitted from this very basic guide.

F-06390

ETC 00327

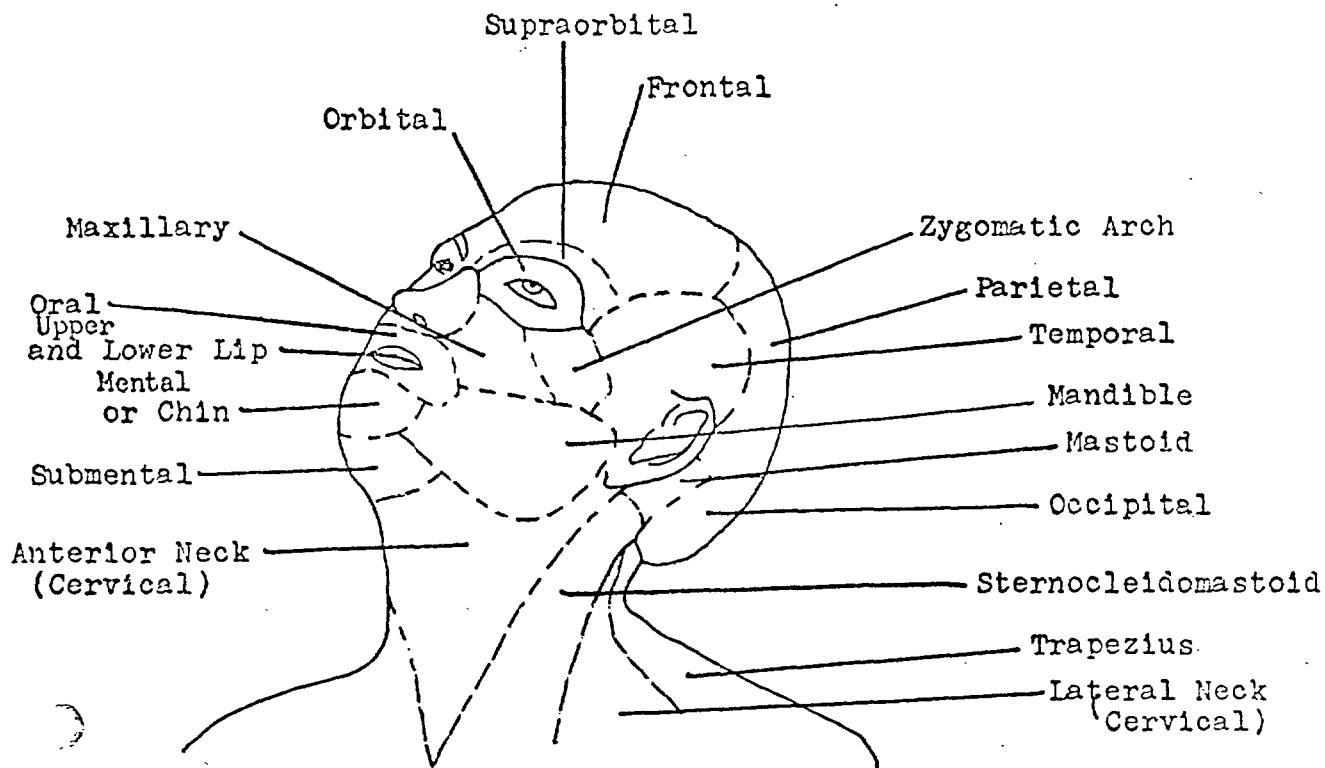
Extent of Injury - 9 Per Cent Rule

The area of one arm is 9 per cent, the area of one leg is 18 per cent, the area of the front of the torso is 18 per cent, the area of the back of the torso is 18 per cent, and the area of the head 9 per cent. The remaining one percent is assigned to the genitalia.

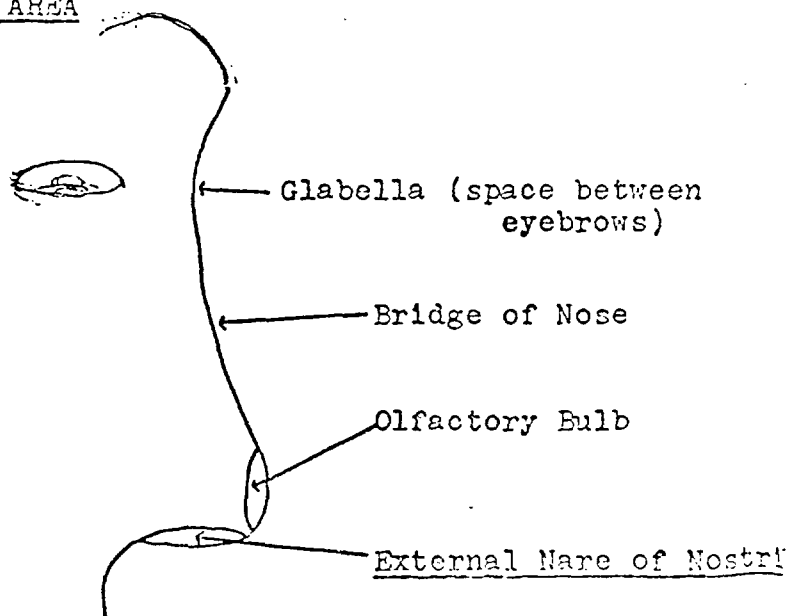


F-06391

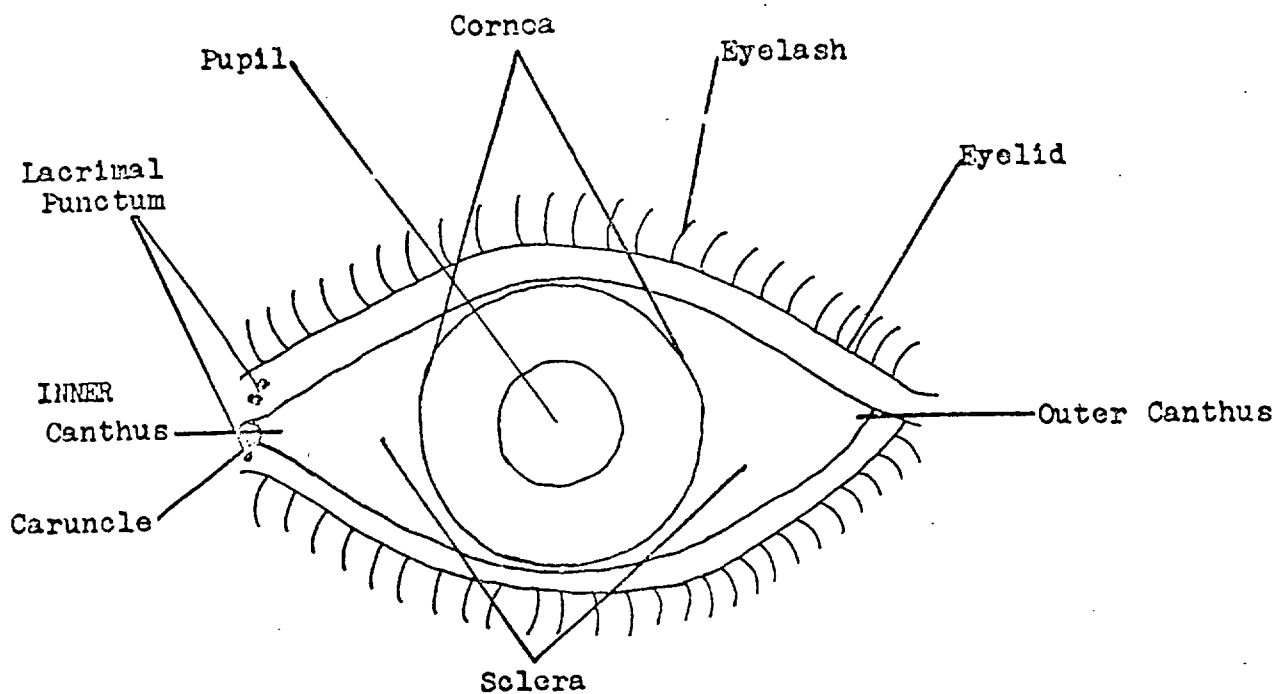
ETC 00328



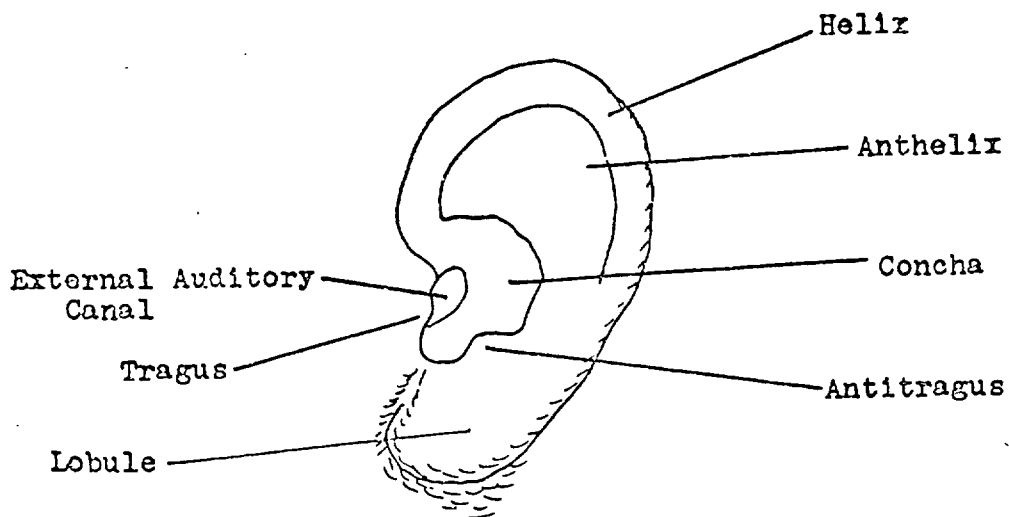
HEAD, FACE, NECK AREA



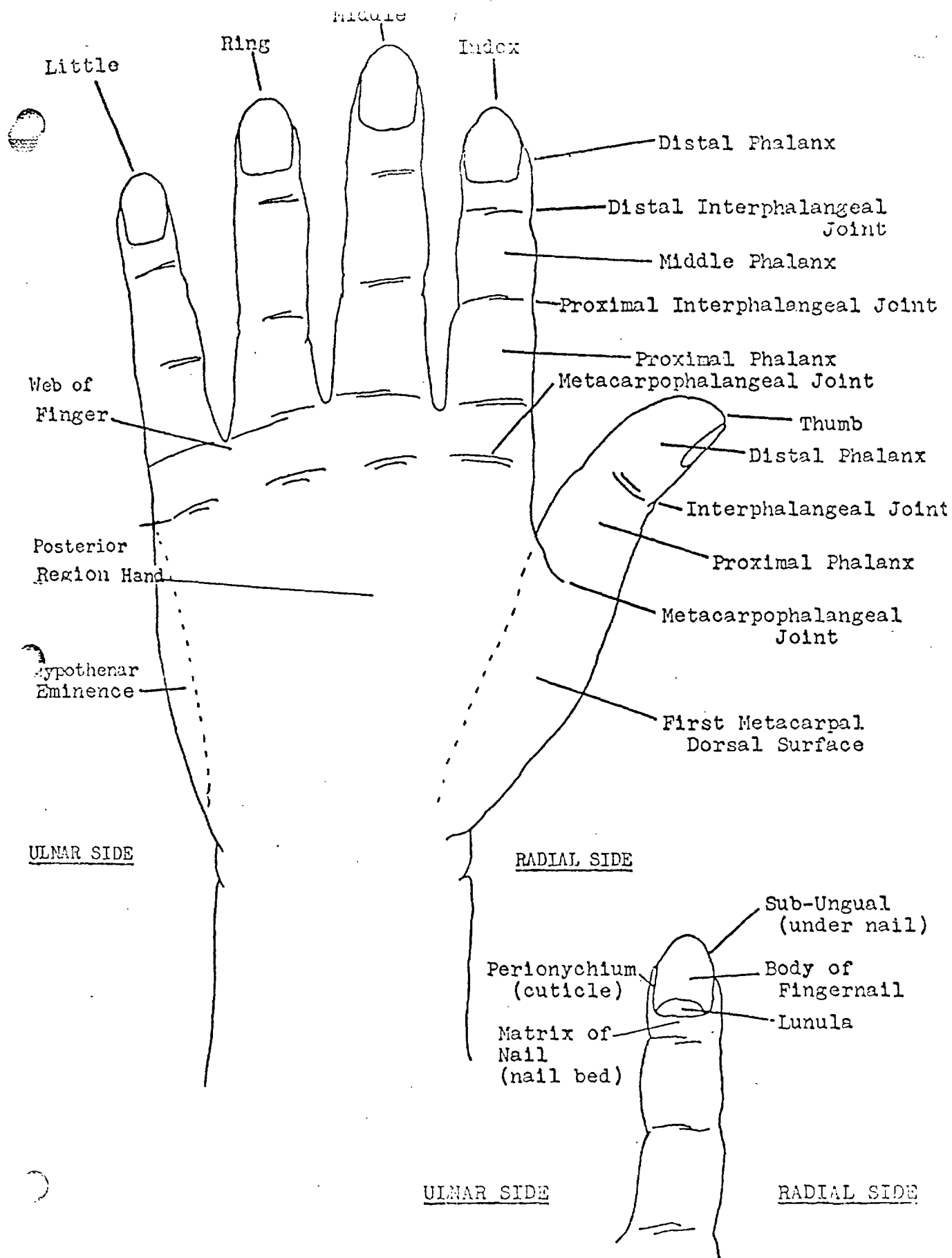
NOSE



EXTERNAL EYE



EXTERNAL EAR



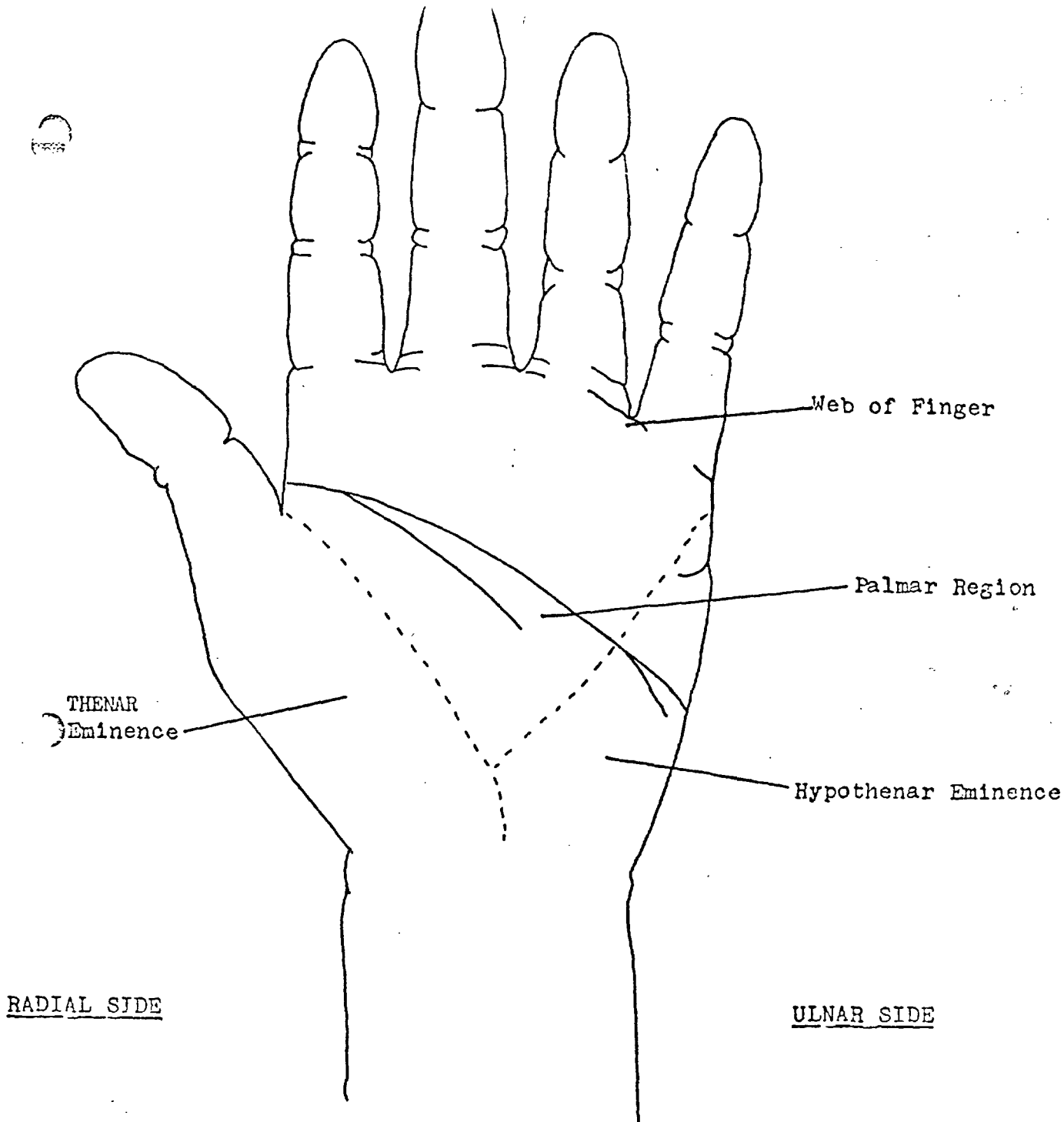
E-06094

Dorsal
Area - pertaining to back of hand

DORSAL VIEW LEFT HAND

FINGER
Perionychia - infected cuticle

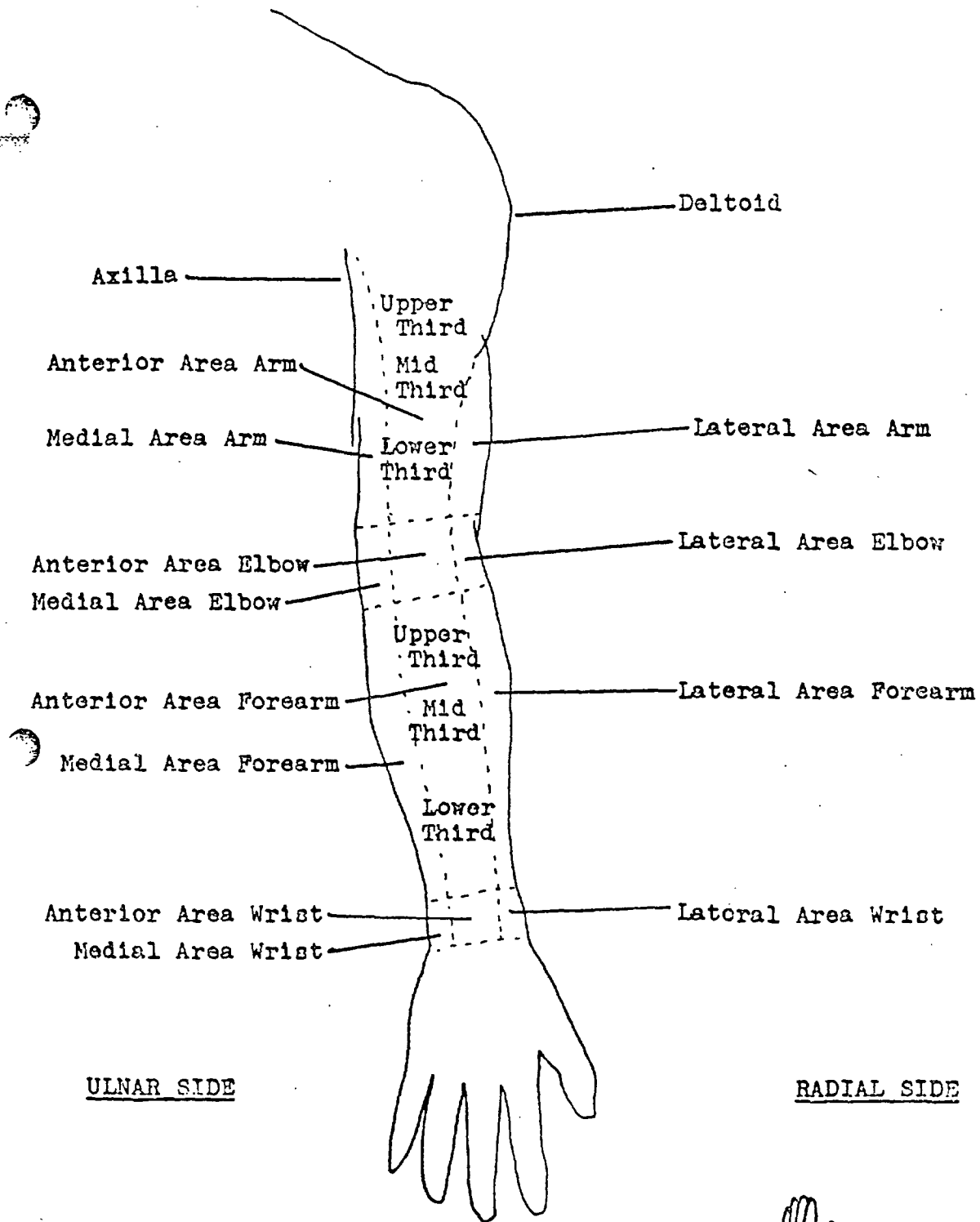
ETC 00331



F-06395

VOLAR OR PALMAR REGION

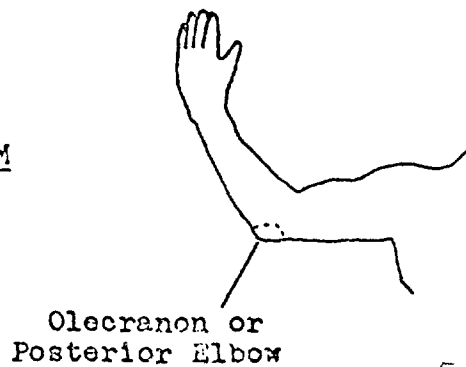
Volar - pertaining to the flexor surface of palm, wrist or forearm.



ULNAR SIDE

RADIAL SIDE

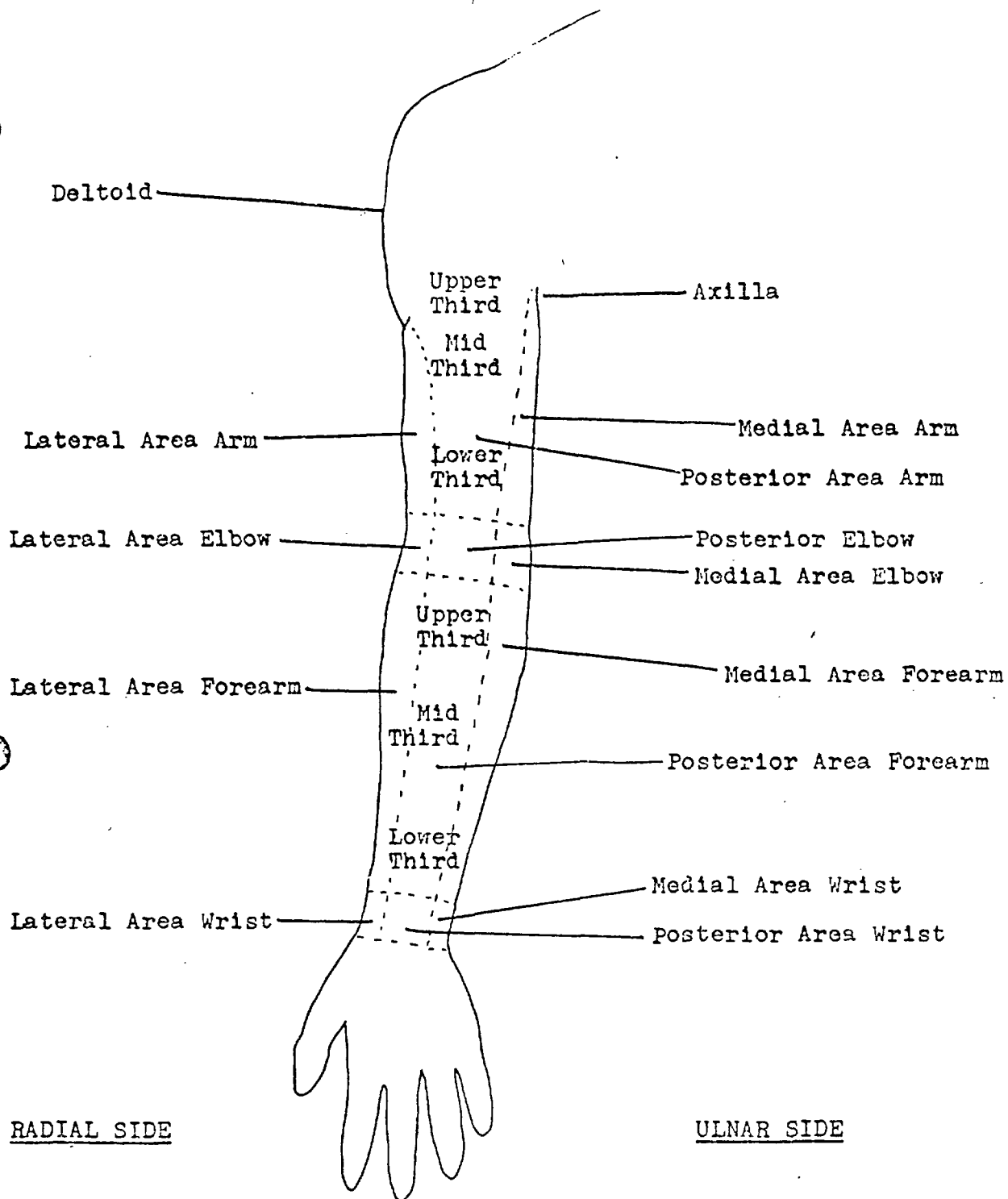
VENTRAL OR ANTERIOR ARM



Olecranon or
Posterior Elbow

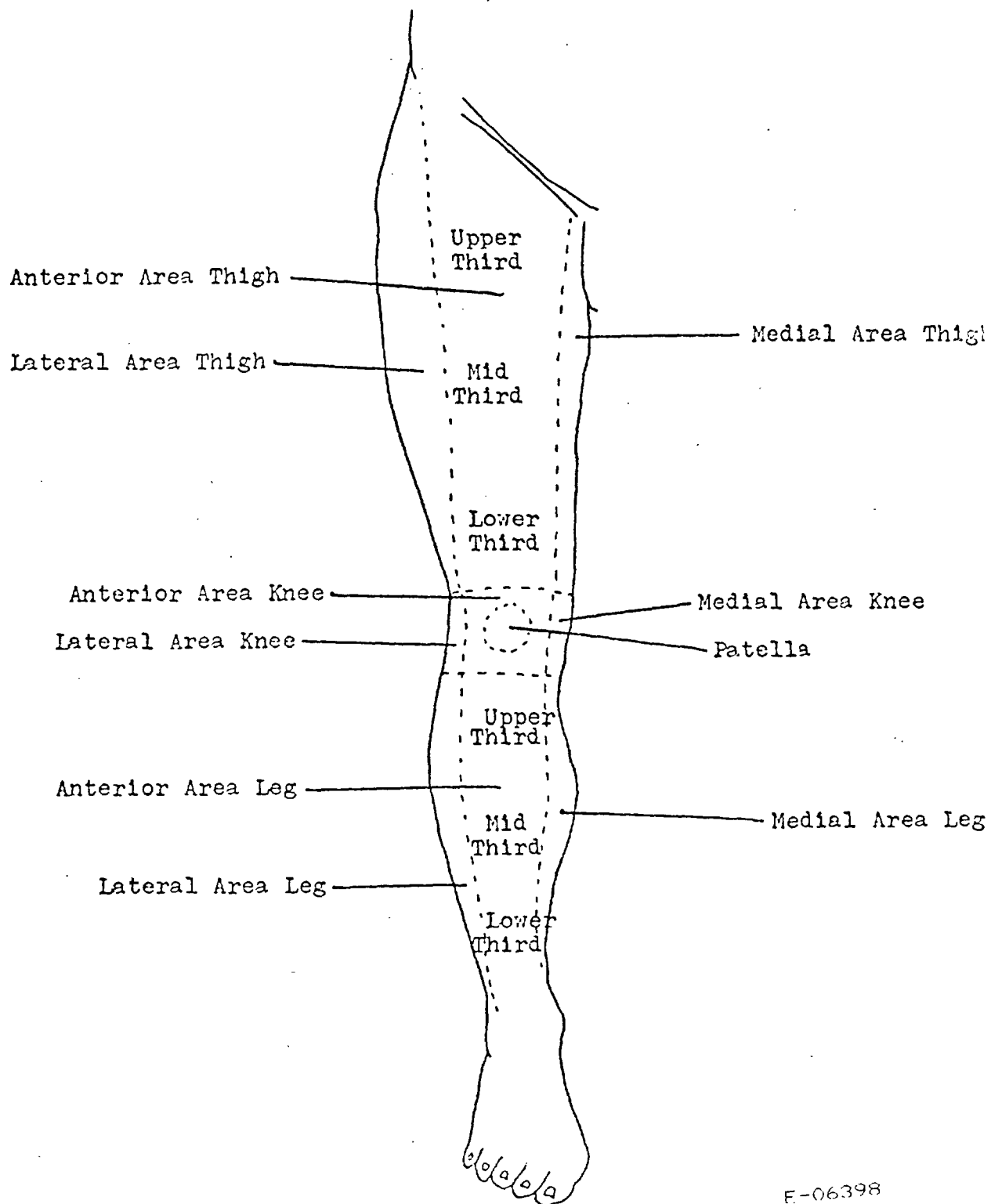
F-06296

ETC 00333

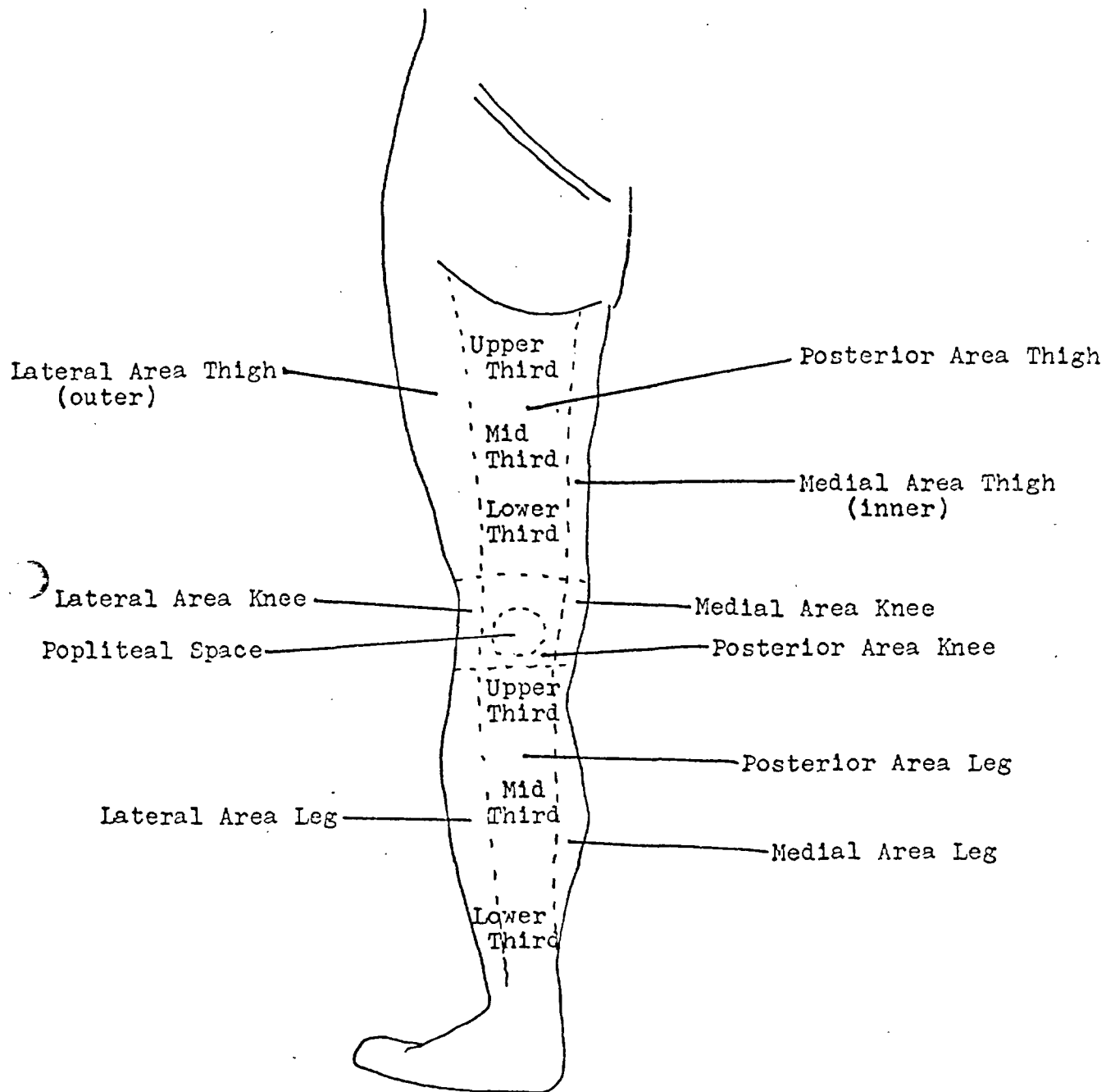


DORSAL OR POSTERIOR ARM

F-06397

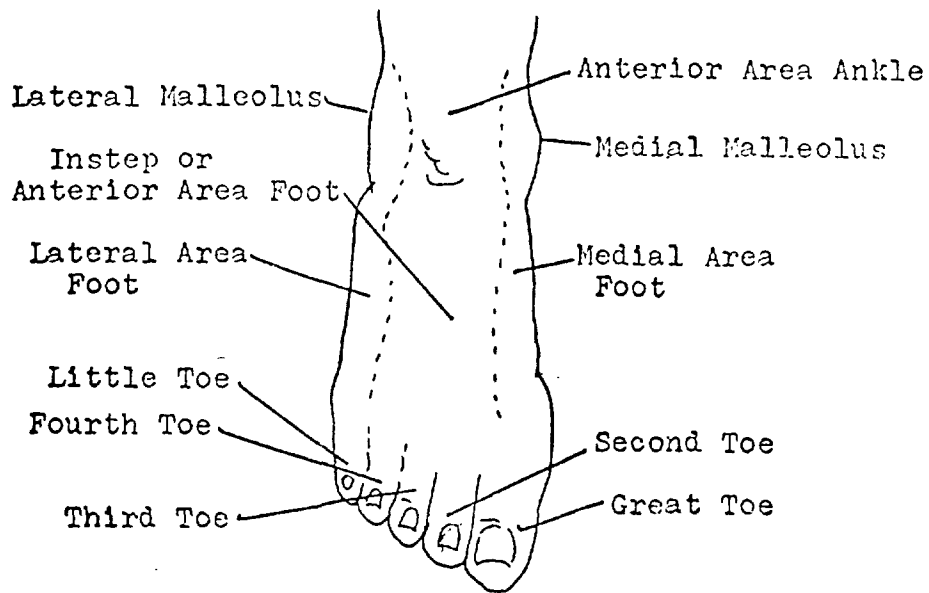


E-06398



POSTERIOR AREA LEG

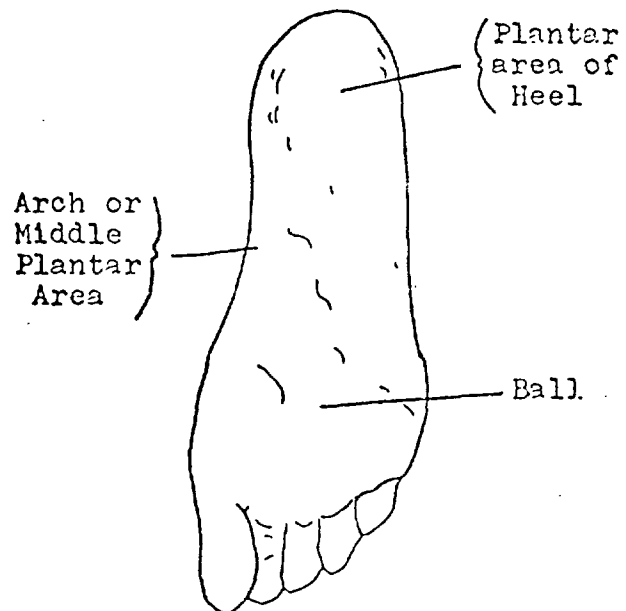
E-06399



DORSAL AREA FOOT (RIGHT)

MEDIAL SIDE

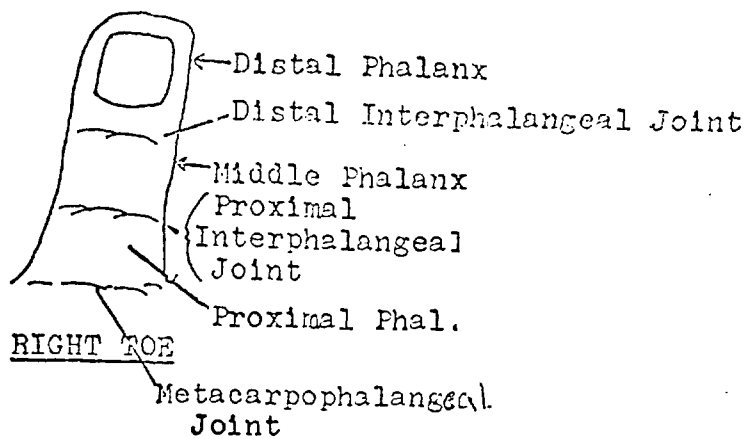
LATERAL SIDE



PLANTAR AREA FOOT (RIGHT)

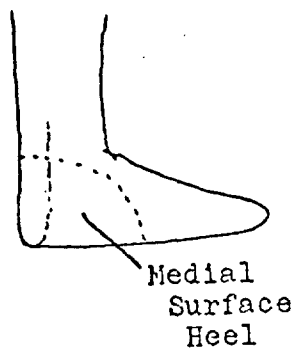
SIDE

SIDE

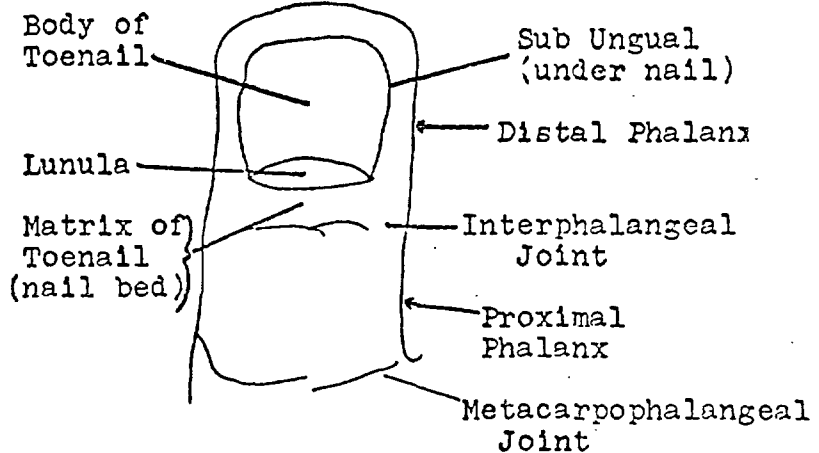


MEDIAL
SIDE

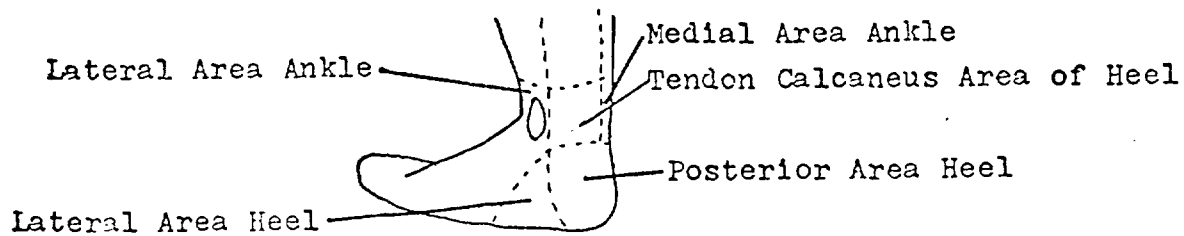
LATERAL
SIDE



MEDIAL AREA FOOT



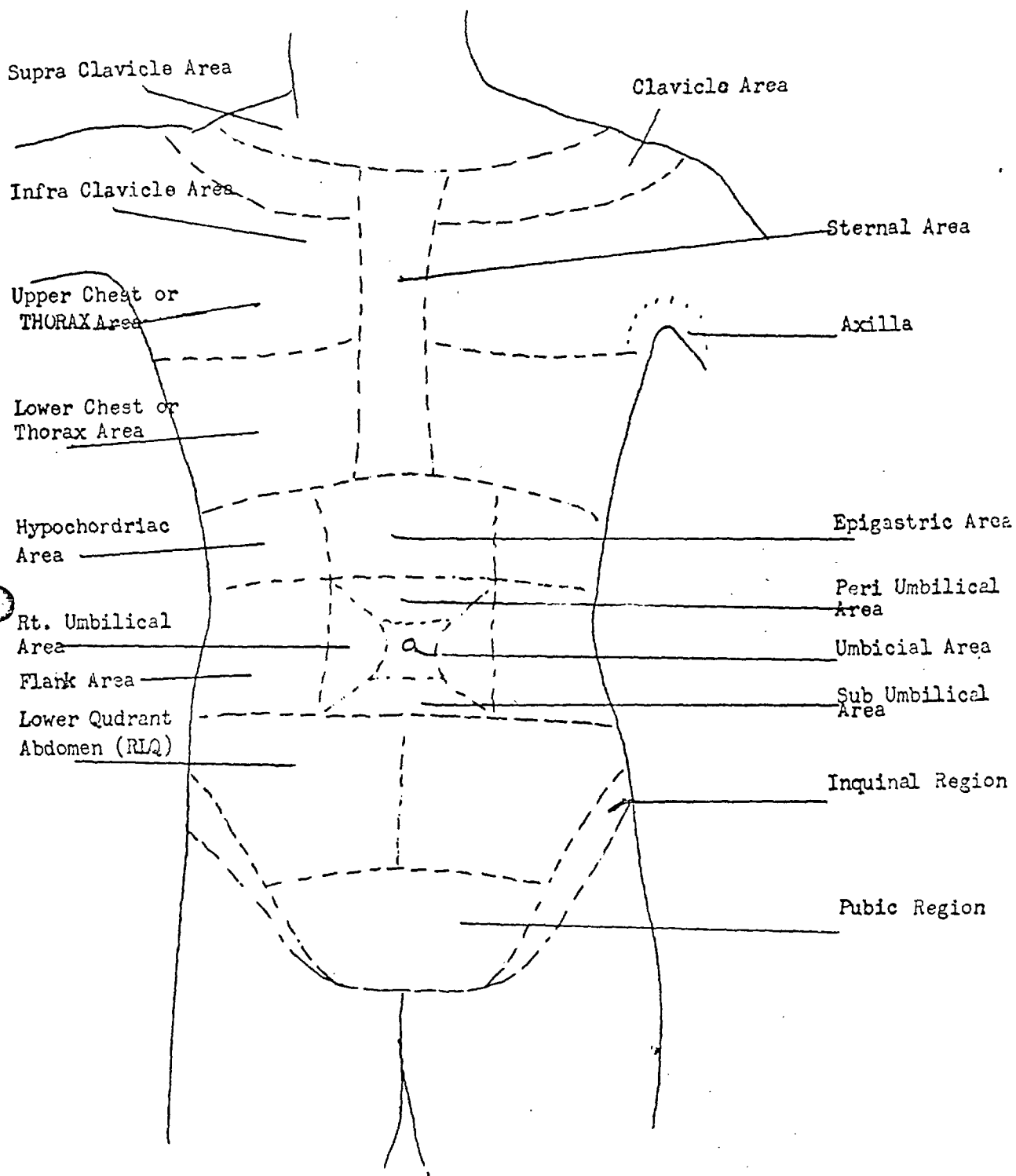
RIGHT GREAT TOE



POSTERIOR AREA FOOT

RIGHT SIDE

LEFT SIDE



ANTERIOR CHEST - ABDOMEN AREA

E-06402

ETC 00339

Trapezius Area

Scapula Area

Lateral Lumbar Area

Flank Area

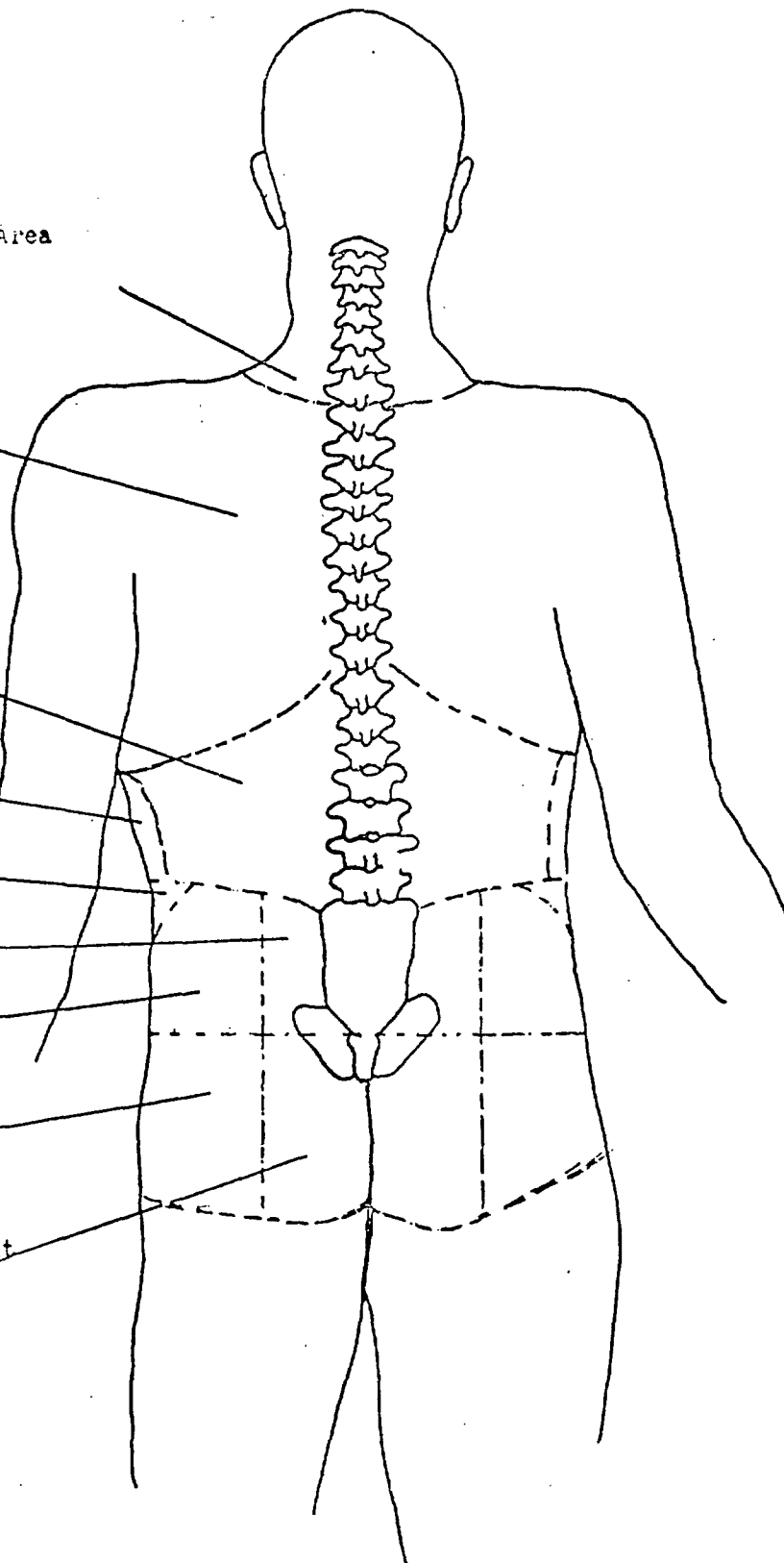
Superior Illiac Crest

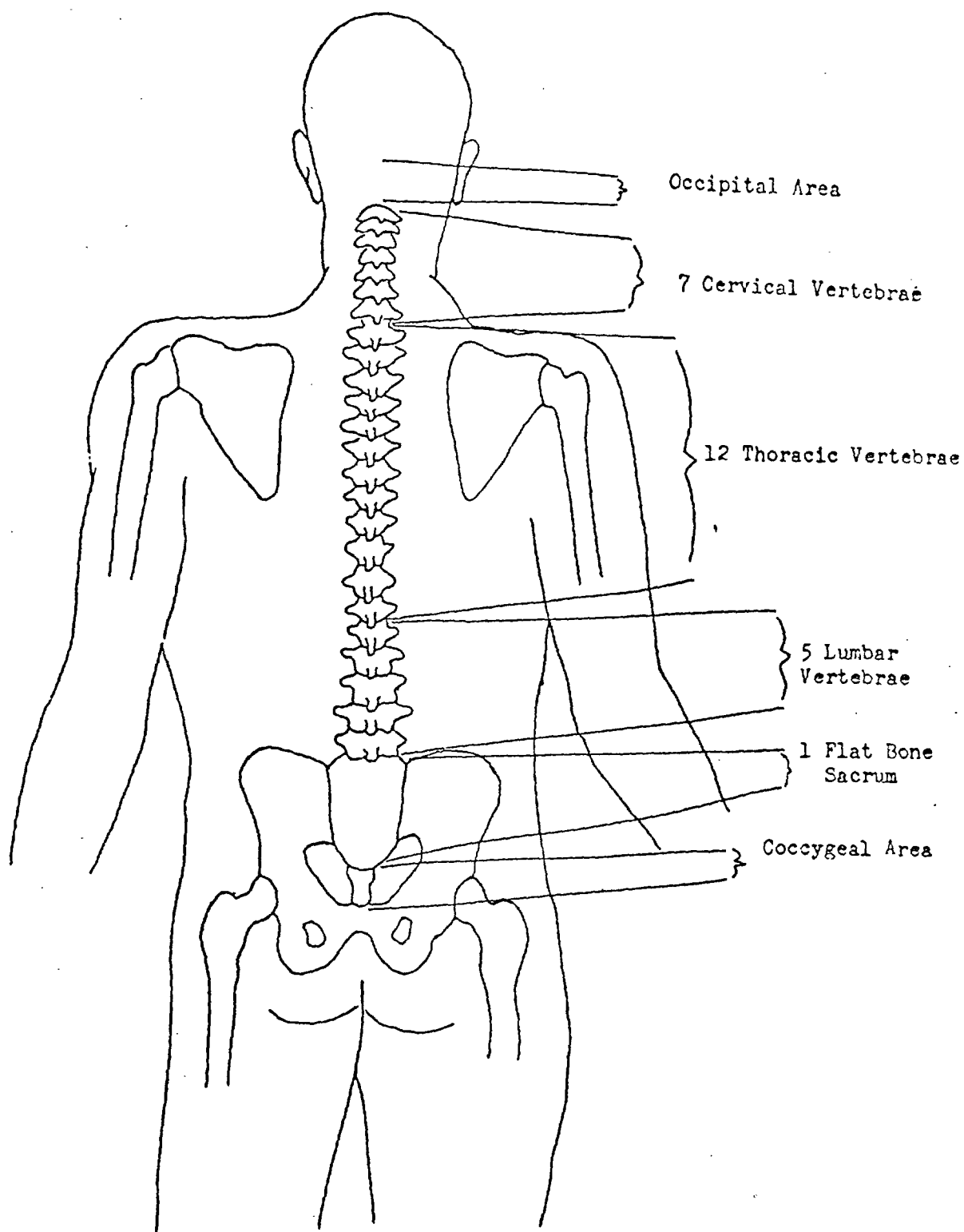
Medial Upper Quadrant Buttocks

Lateral Upper Quadrant Buttocks

Lateral Lower Quadrant Buttocks

Medial Lower Quadrant Buttocks





SPINAL COLUMN BACK

Formation of the Teeth

The Primary Teeth

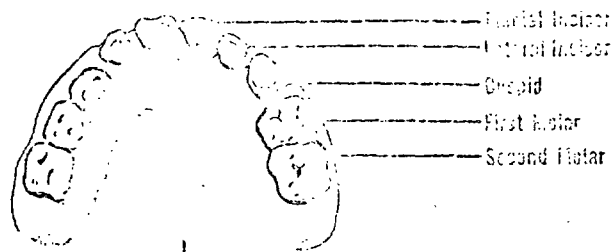


Table of Eruption and Shedding Dates	Names and Number of Teeth	Age of Child at Eruption	Age When Shed
	4 Central Incisors	6 to 9 months	6 to 7 years
	4 Lateral Incisors	7 to 10 months	7 to 8 years
	4 First Molars	12 to 14 months	9 to 11 years
	4 Cuspids (canines)	16 to 18 months	11 to 12 years
	4 Second Molars	20 to 28 months	9 to 11 years

The Permanent Teeth

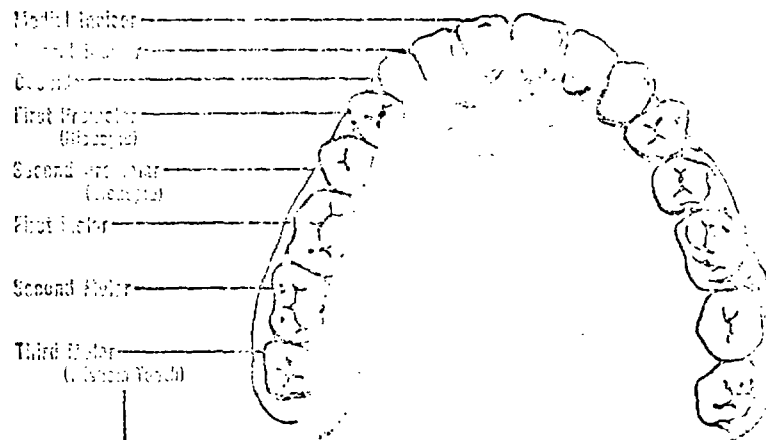


Table of Eruption Dates	Names of Permanent Teeth	Age at Eruption
	First Molars (6 yr. molars)	5½ to 6 years
	Central Incisors	6 to 7 years
	Lateral Incisors	7 to 8 years
	First Bicuspids	10 to 11 years
	Cuspids	10 to 11 years
	Second Bicuspids	11 to 12 years
	Second Molars	12 to 13 years
	Third Molars (wisdom teeth)	16 to 21 years

E-06405

ETC 00342

Disaster Plan

E-06406

ETC 00343

DISASTER PLAN

MEDICAL DEPARTMENT, BATON ROUGE PLANT

I. DEFINITION:

A mass casualty situation exists when the number of patients generated by a plant incident exceeds the capabilities of the Plant.

II. NOTIFICATION:

A) Medical Department, open:

Notification will be through the Plant general alarm system.

B) Medical Department, closed:

The Plant Emergency Area Coordinator will notify the Plant Medical Director, or the Plant Assistant Medical Director, who will, in turn, decide whether to initiate the Medical Department notification plan. (See Annex "A".

III. MISSION:

During a mass casualty situation, the primary mission of the Plant Medical Department is to triage and evacuate patients.

IV. RESPONSIBILITIES:

The Plant Medical Director, or his designee, will be responsible for the overall medical operations.

E-06407

ETC 00344

V. CONCEPT OF TRIAGE:

Triage is the sorting out and classification of injured persons to determine the priority of need and proper place for treatment. Triage will be performed by a physician if at all possible. The priorities are as follows:

1st -- Immediate. This includes abdominal wounds, partial amputations, hemorrhage, chest wounds, pulmonary edema, severe lacerations, severe head injuries and extensive burns:

2nd -- Delayed. This includes closed fractures, mild to moderate burns, (e.g., <30% 2nd deg.), non-hemorrhaging lacerations.

3rd. -- Fatalities.

VI. PATIENT LOCATION:

- A) Immediate -- Plant emergency room area.
- B) Delayed -- Plant ward area.
- C) Fatalities -- Medical proctology room.

VII. CONCEPT OF EXECUTION:A) Medical Department, open:

1) Upon notification of a potential mass casualty situation, a nurse and ambulance will be dispatched to the scene. While preparing the first patient(s) for return to Plant Medical, the nurse will make a rapid assessment of the approximate numbers and types of casualties and return to the Plant Medical as promptly as possible. If warranted, outside ambulance services will be immediately notified, as well as local emergency rooms. This may best be accomplished by use of the Baton Rouge Mutual Aid System plan.

a) Call telephone number 343-4805

using the following form message:

"Mutual Aid, this is, (your name), of Ethyl Corporation Medical Department requesting the following help, (give details), Mutual Aid."

b) Give Mutual Aid the telephone number to call back for additional information.

2) While waiting for outside help, the physician(s) will initiate triage

CHEMICAL EXPOSURES

EFFECTS AND TREATMENT

F-06410

ETC 00347

ALLOY (lead-sodium alloy) is a powdered mixture of metallic lead (90%) and sodium (10%). Since it contains 10% sodium, it can produce skin burns, but more often produces mild skin irritation.

Treatment of skin burns and irritations from alloy is washing with lots of water and a soothing cream such as Nivea.

ALUMINUM ALKYLS. These compounds burn on contact with air, so they cause burns when they contact skin. Although these burns are almost always shallow they are immediately painful and often the burned skin will turn white. Immediate and thorough washing with lots of cold water is important. Ice water compresses relieve the pain and lessen the seriousness of the burns. After this, the treatment is the same as for any other burn. These alkyls are not poisonous. The burns are never as bad as they first appear to be.

ANILINE is highly toxic. Immediate and thorough washing with lots of water and soap. It is important that no tiny spots of aniline remain on the skin or scalp. Special attention should be given the areas around the fingernails and toenails, using a brush if possible. Contaminated clothes should be washed before wearing again, or destroyed if badly contaminated. Shoes and gloves should be burned. Oxygen should be given if skin or lips are blue.

Aniline changes hemoglobin to methemoglobin so the blood cannot carry enough oxygen. Moderate exposure may cause only a bluish or blackish discoloration of lips, cheeks, fingernails or ears. In more severe cases there may be headache, weakness, or irritability. If exposure continues, drowsiness, shortness of breath, unconsciousness or even death can occur.

The symptoms described clear in a few hours if absorption is promptly stopped by thorough bathing and removal from odors. If the bathing is not absolutely thorough, the patient's condition will worsen for several hours.

The patient must be warned to drink no alcohol and to take no headache pills.

"BATH" See caustic. (Bath is a weak caustic.)

BENZENE has an anesthetic affect. The principal hazard is from inhalation of vapors. In case of unusual exposure, call a physician immediately. To prevent collapse, the patient should lie down without a pillow and be kept quiet and warm. It is a mild skin irritant. Contaminated clothing, affected areas of body should be washed thoroughly with soap and water. If liquid benzene enters the eyes, they should be flushed with copious amounts of water.

F-06411

ETC 00348

CATALYST. Different substances are used as catalysts in different areas of the plant.

Thoroughly wash all catalyst off, shower and change clothes. Find out from supervisor what the catalyst contains and call Plant Medical Director, if needed.

A catalyst is a substance which serves to speed up, or slow down, a chemical reaction. Most of the ones used here are not extremely hazardous.

CAUSTIC (Mostly sodium hydroxide or lye). Immediate and thorough washing with lots and lots of water. Eye burns are especially bad from caustic. Burns are sometimes deeper than they appear to be.

After thorough washing, treat like any other burn.

CHLORINE severe irritant of breathing passages. Have patient sit up, give nothing by mouth.

Oxygen in all cases that have breathing distress or cough. Start as soon as possible and give as long as it seems needed. Give at rate of 6 liters per minute.

Reassurance -- lots of this. Stay calm and stay near the patient. He needs to know his condition will improve gradually. Call the doctor if you feel he/she is not doing well. If breathing ceased, restore breathing -- artificial respiration immediately.

Liquid chlorine very corrosive. If in eyes, flush with cold water for 15 minutes. If on skin, remove clothing, shower immediately. Never try to neutralize the chlorine with chemicals.

DEA (Diethylaniline) has an effect like aniline only it is less toxic. However, patient should be handled as for aniline, since it is always possible there may be some aniline in the DEA.

DOWTHERM has strong odor. Is not especially poisonous but should be washed off with water and soap and clothes changed.

Dowtherm can cause skin irritation and a temporary increase in blood pressure.

ETHYL CHLORIDE presents some hazard through inhalation because of its narcotic and anaesthetic action. It may have some local effect on the skin through its refrigerant effect, under some conditions can produce frost bite. If someone is overcome he should be given artificial respiration until he can breathe alone.

ETHYLENE. From a medical standpoint, this is like ethyl chloride.

ETHYLENE DIBROMIDE (EDB) is highly toxic. Immediate and thorough washing with lots of water and soap. All clothing must be thoroughly laundered. Shoes and gloves must be burned.

This substance is absorbed through the skin or by breathing vapors. It is damaging to the lungs, brain, kidney and liver and it will blister the skin if not immediately washed off.

Plant Medical Director should be notified if contact is large or prolonged.

ETHYLENE DICHLORIDE (EDC) is much less poisonous than ethylene dibromide but must be handled the same way. Immediate and thorough washing with lots of water and soap. All clothing must be laundered. Shoes and gloves must be burned.

FLOURIDE OR HYDROFLOURIC ACID. Strongly corrosive, causes serious and painful burns, may have delayed reaction. Remove from skin or eyes immediately by thorough irrigation with water. Involved part should be immersed in iced solution of magnesium sulfate as soon as possible.

If exposed to gaseous hydroflouric acid, carry at once into uncontaminated atmosphere. Do not allow to walk. If breathing has stopped, give artificial respiration and call for ambulance.

HYDROCHLORIC ACID (Liquid). Same effects and treatment as for sulfuric acid.

HYDROGEN SULFIDE. Extremely toxic substance (rotten-egg odor). May cause eye, throat and lung irritation. Give artificial respiration if breathing has stopped. Eye contact -- irrigate with water for 15 minutes.

METHYL CHLORIDE. Seldom causes local irritation, but when inhaled may cause dizziness, staggering gait, drowsiness and, in severe exposures, unconsciousness. Give oxygen. If respiration has stopped, start artificial respiration at once.

NITROGEN. An absolutely inert gas. Pure nitrogen is used to "blanket" certain substances on this plant so oxygen can't get to them. It is also used to "purge" certain tanks or "vessels" so there is no oxygen in them. Man can only live 3 to 5 minutes without oxygen, and nitrogen is only harmful when it displaces the oxygen found in air.

Anyone overcome by nitrogen must be immediately moved into fresh air and given resuscitation.

OLEFINS Not very toxic. Could put a person to sleep if he continued to breathe strong concentration. If a person is overcome he should be taken to fresh air and given artificial respiration if breathing has stopped. Fire and explosion are greater dangers from olefins than are their medical effects. Olefins on skin should be washed off and patient's clothes changed.

ORGANOPHOSPHATES. Rapidly absorbed into the body by ingestion, through skin, including the eyes and by inhalation. Pinpoint pupils are a positive sign of intoxication, requiring atropine antidote. Auto injectors of pre-measured doses of atropine are available at immediate work area. Patient will have weakness, blurred vision, difficulty breathing, accumulation of secretions in respiratory passages. Immediate treatment. Terminate exposure, support respiration, administer atropine, call ambulance. Skin Contact. Soap and water shower. Eye Contact. Irrigate with water immediately

PERMANGANATE. The permanganate solutions used on this plant usually cause very shallow burns and may only leave a brownish stain. Wash with water and apply Nivea cream. Tell patient stain will wear off in time.

PHENOL (Carbolic Acid) is highly toxic. Immediate and thorough washing with lots of water and soap. All clothing must be laundered. Shoes and gloves must be burned.

This substance is absorbed through the skin or by breathing vapors. It is damaging to the brain, kidneys, liver, lungs and pancreas and it will burn the skin if not immediately washed off. Plant Medical Director should be notified.

"PINCKLE" (PNCl₂, Phosphonitrilic Chloride). Causes eye, skin and respiratory irritation. Has a severe initial effect on the eye. Wash immediately with water for 15 minutes. Exposed skin must be washed promptly with soap and water.

PITCH. See tar.

PHOSPHORUS burns spontaneously when exposed to air and may cause severe burns. Vapors are irritating to the nose, throat, and lungs. Place under cool water shower and remove contaminated clothing. Keep burned area wet by immersing in cold water or apply cold water compresses. Medical to examine and treat all cases of phosphorus burns.

SODIUM. Sodium burns when it contacts water and it causes deep burns when it contacts the skin. These burns are always deeper than they appear to be and are slow to heal, especially if on feet or ankles.

Immediate and thorough and repeated washing with lots and lots and lots of water. Then treat like any other burn.

SULFURIC ACID (Battery Acid, Oil of Vitriol). Immediate and thorough washing with lots of water and soap. Sulfuric acid causes a chemical burn which (after thorough washing) is treated like any other burn.

TAR. Tar can often be removed with mineral oil and a gauze square. Handle carefully as there may be an underlying burn.

TEL-TML. If ingested, induce vomiting. Immediate and thorough washing with kerosene, if available, followed by lots and lots of water and soap. Be sure hair, scalp and under nails are washed also. All clothing is to be destroyed (burned).

These substances are absorbed through the skin and by breathing vapors. They irritate the brain and cause insomnia, headache, nervousness and other symptoms. All exposed employees are to see the nurse or doctor at the earliest convenient time. Keep accurate record of time and length exposed, how long before showered, type of exposure (respiratory, skin), material(s) to which exposed, where occurred, area of skin involved. Duration with or without mask.

It is important to remember that the symptoms of TEL poisoning can also be caused by worry, fear or anger.

TRICHLOROETHYLENE. Essentially an anesthetic, also will cause irritation of skin or respiratory tract. If breathing has ceased, start artificial respiration. Keep patient quiet and warm. Skin Contact -- drying effect. Wash with soap and water.

VINYL CHLORIDE. Primary hazard is associated with excessive respiratory exposure. Affects the central nervous system producing intoxication and dulling of visual and auditory responses (light headedness, some nausea). If not breathing, give artificial respiration. Remove to fresh air. Skin Contact -- Wash with soap and water. Clothing, including shoes, should not be worn again until dry.

Vinyl chloride probably causes liver damage and possibly cancer in employees with large exposure for many years.

VII. CONCEPT OF EXECUTION
(continued)

and, along with nursing personnel, administer life saving measures to those in the "immediate" category.

3) Upon arrival of outside help, patients in the "immediate" category will be evacuated, the most urgent first.

4) Following this, those in the "delayed" category may be evacuated, keeping in mind that all fractures must be immobilized prior to movement.

5) In the event of fatalities, the coroner will be notified at the earliest available moment, (See Annex "B")

6) At the earliest convenient moment, religious personnel of the appropriate faith should be notified - (See Annex "B")

B) Medical Department closed:

1) Should a disaster occur when the Medical Department is closed, the Emergency Area Coordinator will notify the Plant Medical Director, or his Assistant, who, in turn, will decide whether to initiate the alert notification system for the Medical Department.

2) It can be assumed that by the time an effective medical team can be assembled, plant supervisory personnel

VII. CONCEPT OF EXECUTION
(continued)

-5-

will have initiated evacuation procedures. This being the case, the medical team leader will report to the Emergency Area Coordinator for instructions.

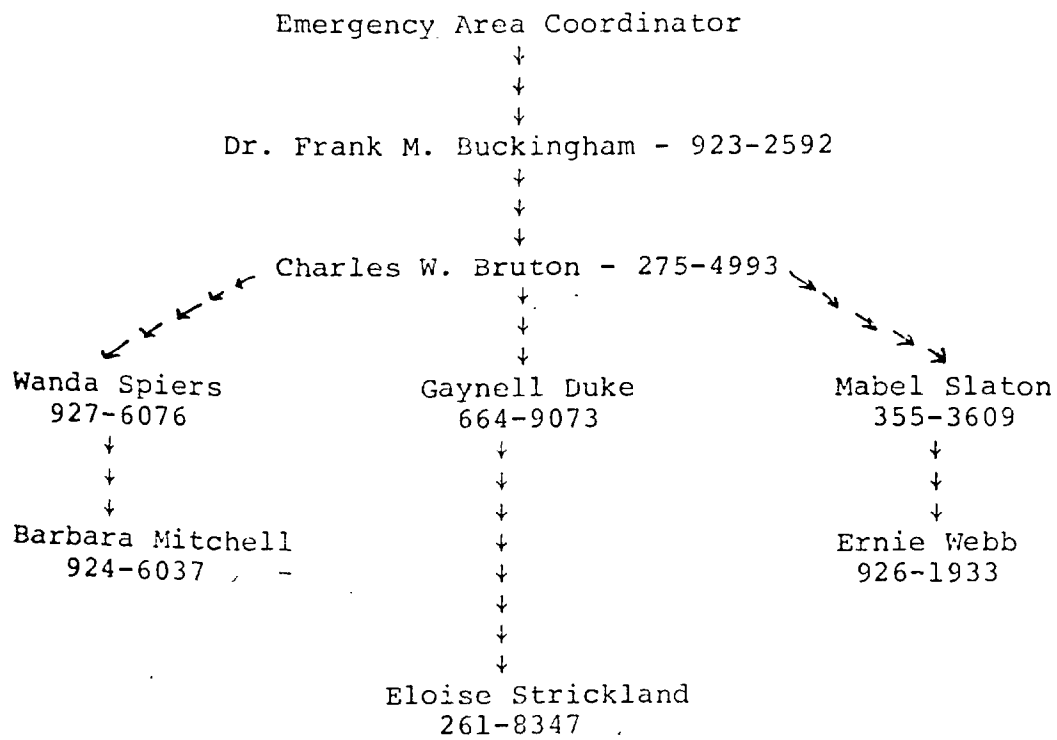
3) All or part of the guidelines set forth under VII "A" may be followed depending on the circumstances.

F-06417

ETC 00354

ANNEX A

ALERT NOTIFICATION PLAN



F-06418

ETC 00355

ANNEX B

CHAPLAIN CALL LIST

CATHOLIC: Father Michael Collins
 or
 Father Bryan Gray
 St. Charles Catholic Church
 356-2527

JEWISH: Rabbi Brahmes
 B'Nai Israel Temple
 Synagogue: 343-0111
 Home: 766-5867

PROTESTANT: Brother Charles Matthews
 Weller Avenue Baptist Church
 Church: 355-4407
 Home: 355-8349

E-06419

ETC 00356

ANNEX C

CRITICAL PHONE NUMBERS

Baton Rouge Mutual Aid System - 343-4805

Baton Rouge General Hospital Emergency Room - 387-7600

Our Lady of the Lake Emergency Room - 387-8826

East Baton Rouge Coroner's Office - 389-3047

F-06420

ETC 00357

Workroom Air, ed. 3, pp. 26-27, Cincinnati, 1976.

6. Dibbell, D. G., *et al.*: Hydrofluoric acid burns of the hand. J. Bone Joint Surg., 52A:931, 1970.
7. National Institute for Occupational Safety and Health, U.S. Department of Health, Education and Welfare: Criteria for a Recommended Standard. Occupational Exposure to Boron Trifluoride, (NIOSH) 77-122, pp. 13-42, Washington, D.C.: U.S. Government Printing Office, 1976.

BROMINE

Br₂ 1977 TLV 0.1 ppm

Synonyms: None

Physical Form: Dark reddish-brown, fuming, volatile liquid

Uses: Gold extraction; military gas; bleaching agent; antiknock compounds for gasoline

Exposure: Inhalation

Toxicology: Bromine is a severe irritant of the eyes, mucous membranes, lungs, and skin.

In humans, 10 ppm is intolerable, causing severe irritation of the upper respiratory tract; lacerimation occurs at levels below 1 ppm.¹ Symptoms and signs in humans also include dizziness, headache, epistaxis, cough, followed some hours later by abdominal pain, eruption on the face, trunk, and extremities.² Pulmonary edema and pneumonia may be a late complication of severe exposures.³ The liquid or concentrated vapor in contact with the eye will cause severe and painful burns.³ Liquid bromine spilled on the skin causes a mild, cooling sensation on first contact; followed by a burning sensation.³ If bromine is not removed from the skin immediately, deep surface burns result; brown discoloration appears, leading to the development of deep-seated ulcers, which heal slowly.³

Exposure of three animal species to 180 ppm for seven hours caused severe eye irritation, with clouding of the cornea, severe irritation of the respiratory tract, dyspnea, and some fatalities.

The TLV was set at a level to prevent irritation of the respiratory tract and lung injury.¹

Diagnosis: Signs and symptoms include dizziness, headache; lacrimation; epistaxis; cough, feeling of oppression, pulmonary edema, pneumonia; abdominal pain, diarrhea; measles-like eruption of the face, trunk, and extremities; severe burns of the eyes and skin.

Differential Diagnosis: In mild exposure resulting in mucous membrane irritation, the symptoms may mimic a viral upper respiratory tract infection. The latter may be characterized by fever, myalgias, and lymphocytosis.¹

As the tracheobronchial tree and pulmonary parenchyma become involved, the symptoms and signs must be differentiated from cardiogenic pulmonary edema, severe viral or bacterial pneumonia, and adult respiratory distress syndrome.

Special Tests: Diagnostic studies should include electrocardiogram, sputum gram stain and culture, differential white blood cell count, and arterial blood gas analysis.

Treatment: If bromine is inhaled, immediate hospitalization and observation for 72 hours for delayed onset of severe pulmonary edema are advisable. Refer to Therapeutic Maneuvers in Treatment of Respiratory Irritants, Chapter 6. Obtain chest x-ray and examine for infiltrates. Perform analysis of arterial blood gases. Maintain P_{O₂} above 60 mm Hg by instituting, in stepwise fashion, the following measures as needed:

1. Administration of 60 to 100 percent oxygen by mask or cannula
 2. Intubation and mechanical ventilation
 3. Positive end expiratory pressure breathing
- Fluid balance must be maintained; use of a diuretic may be required. Steroids may be administered on a short-term basis (two to four days) to decrease the inflammatory response of the lung.
- If eyes are irritated, flush with water; flush skin with water if splashed with liquidified bromine.

If dermatitis occurs, see section in Chapter 5 on Treatment of Contact Dermatitis.

Medical Control: Preplacement and annual physical examination, with emphasis on skin

and respiratory system; pulmonary function testing, such as FVC and FEV (1 sec.); 14" x 17" chest roentgenogram.

References

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3. M.C.A., Inc.: Chemical Safety Data Sheet SD-49, Bromine, pp. 5, 16-18. Washington, D.C., 1968.
4. A.C.G.I.H.: Bromine. Documentation of the TLVs for Substances in Workroom Air, ed. 3, p. 27. Cincinnati, 1976.

BROMOFORM

CHBr₃ 1977 TLV 0.5 ppm

Synonyms: Methenyl tribromide; tribromomethane

Physical Form: Colorless liquid

Uses: Synthesis of pharmaceuticals; used in shipbuilding and aircraft industries

Exposure: Inhalation; skin absorption; ingestion

Toxicology: Bromoform is a respiratory irritant and causes central nervous system depression.^{1, 2}

Human exposure to the vapor causes irritation of the eyes and throat.^{1, 2} Accidental ingestion of the liquid has produced central nervous system depression with coma and loss of reflexes; smaller doses have led to listlessness, headache, and vertigo.¹ Chronic effects have not been reported from industrial exposure.³

A saturated atmosphere of 7000 ppm or more produced anesthesia in dogs in eight minutes and death in 60 minutes, with evidence of respiratory irritation and liver damage.³

Bromoform has a chloroform-like odor.¹ The TLV was set at a level to prevent irritation and liver damage.³

Diagnosis: Signs and symptoms of the eyes and nose and coma. B caused in animals, if damage.

Differential Diagnosis: other causes of central nervous system irritation of the upper respiratory. Severe exposure "fused" state; different such as hypoglycemia revascular accident, emic episodes, heat confusion, hysteria, toxic encephalopathy cephalitis.

Special Tests: If significant depression occur, of rectal temperature; neurologic examination

Treatment: Institute deures, such as removal of ing of skin areas, and water. Treat central symptomatically.

Medical Control: 1. Emphasis on skin, liver, or chronic Such persons may be exposure.

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EVALUATION

1. Estimate the Injury

- A. History
- B. Body Surface Area
- C. Depth of Burn

2. History and Physical Examination

- A. Brief History should include:
 - 1. Circumstances, force, location, etc.
 - 2. Pre-accident health of patient
 - 3. Pre-accident medications
 - 4. Allergies
 - 5. Tetanus immunization
- B. Physical Exam

3. Determination of Severity of Burn

- A. Body Surface Area
- B. Depth of Burn
 - 1. Superficial Burn
 - 2. Partial Thickness Burn
 - 3. Full Thickness Burn

4. Types of Burns

- A. Contact-Tar Burn, Scald
- B. Flammable Liquid
- C. Fabric
- D. Burns Associated with Child Abuse
- E. Smoke Inhalation
- F. Carbon Monoxide
- G. Special Burns
 - 1. Electrical Burns
 - 2. Chemical Burns

E-06422

ETC 00359

COMPREHENSIVE CARE OF THE BURN PATIENT EVALUATION

John A. Boswick, Jr., M.D. F.A.C.S.

Evaluation or assessment of the patient with a burn injury is an important consideration in the overall management. The evaluation should provide information as to the seriousness of the injury. This depends on the extent, depth and location of the wounds, as well as the patient's age, preexistent diseases, associated injuries, and mechanism or etiology. An evaluation of the patient should also determine what patients need to be hospitalized, require intravenous fluid replacement, early wound excision, antibiotics, topical drug therapy, and other aspects of care.

The patient assessment should start with a detailed history that includes the time, location, and exact circumstances of the injury. This includes the etiology or burning agent, whether or not the accident was in a closed space where the heat and smoke might have been intense. The history should also include all information of the patient's past health status. Information on allergies, medications, and status of tetanus immunization are especially important.

A complete and detailed physical examination should be performed. No aspect of the physical should be omitted. Special emphasis should be placed on evaluating the extent and depth of the injury. The location and types of burns are important in children where child abuse might be a problem. The simplest and most expedient way to determine the extent of a burn injury is to use charts designed for this purpose. These charts should take into consideration the variation in body surface for different age groups.

A reasonable estimate of depth of injury should be made. This can be determined by the history of injury and wound appearance. In some situations, the presence of sensibility may help distinguish between a deep partial and a superficial full thickness injury. If there is dirt, grease, smoke or other discoloring agents on the wound or on the patient, it is better to remove these agents before estimating the extent and depth of the injury. Grease and dirt can be confused with burned skin, or might be misleading as to depth.

E-06423

ETC 00360

TRANSFER AND STABILIZATION

1. "Specific Optimal Criteria for Hospital Resources for Care of Patients with Burn Injury"

2. Consider for Transfer:

- A. Third Degree Burns Greater Than 10% BSA
- B. Second Degree Burns Greater Than 20% BSA in Adults and 10% in Children
- C. Serious Burns of the Face, Hands, or Feet
- D. Burns of the Perineal Area and the Genitalia
- E. Circumferential Burns of an Extremity
- F. Electrical Burns
- G. Inhalation Burns

(AMPLIFY BY EXAMPLE ON THE ABOVE)

3. Stabilization of the Burn Patient Prior to Transfer

- A. Airway
- B. Lifeline
- C. Intravenous Fluids
- D. Urinary Output
- E. Medications Administer Intravenously

4. Transfer Information

- A. Utilize a Burn Diagram
- B. Utilize a Transfer Form
- C. Transfer Agreements

5. Transportation

- A. Stress Physician to Physician Contact
- B. Stress the Need for a Transport Team
 - 1. Advantages:
 - a. Provides Personnel Familiar with Acute Burn Care
 - b. Provides Personnel Skilled in Stabilization of Airway and Fluid Resuscitation

TRANSFER AND STABILIZATION OF THE SEVERELY BURNED PATIENT

Alan R. Dimick, M.D., F.A.C.S.

These comments will naturally be limited to the more severely burned patient with a greater extent of burn rather than small or minor burns. They will also apply to burn patients with complications in addition to their burn injury, such as inhalation injury, multiple fractures, and lacerations.

A bench mark for burn care was the publication in 1976 by the American Burn Association of Specific Optimal Criteria for Hospital Resources for the care of patients with burn injury. Included in these criteria are categories of burn injury as well as categories of burn care facilities. One should be aware of these criteria because they concern stabilization, treatment and transfer of burn patients. Three categories of burn injury are listed: minor burns covering less than 15% of the body surface; moderate uncomplicated burns ranging from 15-25% of the body surface; and major complicated burn injuries which are greater than 25% of the body surface and which may also have electrical injuries, inhalation injuries and burns of strategic areas such as face, hands, feet, perineum and genitalia. Major burns also include patients with serious medical problems such as hypertension and diabetes.

Depending on the level of burn care expertise at the receiving hospital, moderate uncomplicated burn injuries and/or major complicated injuries should be referred to a major burn care facility such as the Burn Unit or Burn Center. Obviously this depends on the local inventory and classification of burn care.

It is imperative that a hospital which cannot care for all levels of burn injury have transfer agreements with burn care facilities. Transfer agreements are recommended by the Joint Commission on Accreditation of Hospitals because they provide established protocols for these critically ill patients. Such an agreement is between two hospitals and is usually signed by the chief of the medical staff and hospital administrator. Therefore when the burn patient arrives, initial stabilization occurs and transfer is initiated to the level of care which is appropriate for the severity of the burn injury. One cannot emphasize how important it is to have these transfer agreements in place so that delay in transferring the acutely burned patient is minimized, because the initial care and especially the early care in the initial phases of burn injury are so important for later results in the burn patient. These considerations for transfer should be well thought out in advance and included in the transfer agreement. In general, the guidelines of the ABA Specific Optimal Criteria state major burn injuries should be referred to a burn unit or burn center. Depending on the level of burn care expertise at the given hospital, the patient may either be admitted to that hospital or referred to a hospital that can treat the moderate uncomplicated burn injuries.

The patient should be stabilized before transfer either from the emergency department into the same hospital or from the emergency department to the burn center. Four major concerns are:

1. Airway must be maintained and oxygen administered. Burn patients are usually hypoxic during the initial 24-48 hours and should always receive at least nasal oxygen therapy.
2. Dry sterile dressings should be applied and the patient should be covered with a blanket for insulation to conserve and maintain his body temperature. One should not cool the burn, or apply ice to the burn, because there is not normal sensation in this area and frostbite can very quickly occur. Also, hypothermia will occur dropping the body temperature causing cardiac arrest if the patient is cooled too rapidly. Therefore, because of these complications, it is best not to try to cool a major burn, but rather wrap the patient in a dry sterile dressing, cover with a blanket and transfer him. If the patient is being referred to another hospital, it is best to simply apply a dry sterile dressing to the burn wound and send the patient. The rationale here is that if any kind of cream or ointment is applied to the burn surface, it will have to be removed when the patient arrives at the receiving facility. Therefore, it is best not to apply cream or ointments if the patient is going to be transferred within the next hour or two.

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ETC 00362

AIRWAY

1. Pathophysiology

- A. Airway Thermal Injury
- B. Inhalation Injury

2. Clinical Manifestations

- A. Signs of Airway Injury
 - Facial Burns
- B. Signs of Smoke Inhalation Injury
 - Carbonaceous Deposits
- C. Physical Signs of Smoke Inhalation Injury

3. Radiologic Manifestations

4. Laboratory Manifestations

- A. Arterial Blood Gas Manifestations
- B. Ventilation Profusion Relationships

5. Measures of Support

- A. Bronchoscopic Evaluation
- B. Bronchoscopic Therapeutic Measures
- C. Respiratory Support with Mechanical Ventilation

F-06426

ETC 00363

AIRWAY

Glenn D. Warden, M.D.

Successful management of respiratory problems may be life saving following thermal injury. While the possibility of respiratory injury exists with all burns, likelihood is increased in the following associations; burned in a close space, unconscious during the fire, burns of the head, neck and oral pharynx, singed nasal hairs, presence of a productive cough and presence of carbonaceous sputum. Respiratory injuries are best diagnosed by maintaining a high index of suspicion and treating expectedly. Respiratory injuries may be divided into four major classifications — asphyxia/carbon monoxide, upper airway obstruction, tracheobronchial injury, and inhalation injury.

Asphyxia/Carbon Monoxide—These entities can kill a burn patient without producing any damage what-so-ever to the respiratory tract. Both are common causes of the "dead-on-arrival" burn patient. Symptoms of carbon monoxide intoxication include headache, confusion, somnolence or coma. Frequently symptoms correlate poorly with carboxy-hemoglobin concentrations. Also, burn patients often do not exhibit the so called cherry-red cyanosis of carbon monoxide poisoning. Asphyxia may present as an agitative combative or somnolent patient. Treatment of both disorders should be empiric when suspected and should not await blood gas results. High flow oxygen alleviates asphyxia and speeds the clearance of carbon monoxide to the blood stream. Carboxy-hemoglobin levels should be determined as soon as possible and followed subsequently until normal. Long term, permanent neurological sequelae are common following asphyxia or carbon monoxide exposure.

Upper Airway Obstruction—Upper airway obstruction may be due to oral pharyngeal burns, laryngeal spasm, or obstruction from massive upper airway edema. Upper airway obstruction may occur in the absence of airway injury, *per se*. Burn patients are at risk from upper airway obstruction from the time of burn injury until the point of maximum edema formation which occurs at 18 to 24 hours post-injury. Elective nasal-gastric intubation can be performed if the obstruction appears progressive or imminent.

Tracheobronchial Injury—Damage to the upper respiratory tract resulting in a tracheobronchitis occurs from products of incomplete combustion including aldehydes, acids, cyanide and carbonaceous particles. In addition, super heated steam may also cause direct damage to the trachea. These products may damage any part of the tracheobronchial tree or the pulmonary parenchyma itself. Injury to the upper respiratory tract and large airways is manifested by hoarseness, a dry brassy cough, and a production of copious bronchial secretions. During the first 48 hours following injury, tracheobronchial injury develops progressive edema and sloughing of the bronchial mucosa. Such patients are also at risk from obstruction due to edema and inability to clear secretions. Treatment may necessitate intubation and aggressive pulmonary toilet. Such patients are also at risk from infection and should be followed with chest PT until completely healed.

Pulmonary Inhalation Injury—The true inhalation injury involves the pulmonary parenchyma itself, and is generally thought to involve the bronchiolar size passages. In addition, there is generally a component of large airway injury. The pathophysiology is a direct toxic injury to the small bronchiolar passages and alveoli from combustion products and soot. Thus, inhalation injury can best be categorized as a chemical injury to the pulmonary parenchyma. This injury is often delayed in onset presenting 12 to 96 hours post-burn with interstitial infiltrates, hypoxemia, decreased pulmonary compliance and elevated shunt fractions—the typical picture of ARDS. Diagnosis is made by maintaining a high index of suspicion and by serial evaluation of blood gases and chest x-rays. The Xenon ventilation-perfusion scan is invaluable in detecting pulmonary injury and is positive prior to the onset of clinical symptoms. Bronchoscopy confirms the diagnosis of associated tracheobronchial injury. Treatment includes intubation and mechanical ventilatory support with PEEP. True inhalation injury strongly predisposes patients with major thermal injuries to pulmonary infection which frequently lead to the patients demise. Accordingly, vigorous chest physical therapy and meticulous pulmonary toilet are recommended. There is no evidence to support the use of steroids or antibiotics on such patients.

F-06427

ETC 00364

CASE REPORT — AIRWAY

A nineteen year old girl is admitted to the hospital following a laboratory explosion and fire. Alcohol was ignited by a Bunsen burner resulting in burns of the face, neck, chest and both arms.

Physical examination revealed a restless patient complaining of pain in the throat and hands. There are burns of the face with singeing of the eyebrows and nares. Her laboratory garment is attached to the underlying burn skin. Burns of both hands and arms are full thickness. Her body weight is 60 kg.

Initial stabilization is carried out with the insertion of two longwell catheters and infusion of lactated ringers solution. The patient is receiving oxygen by mask at 6 L./min.

Medical history obtained from the family indicates no allergies, sensitivities or significant medical illnesses. The patient is engaged and a wedding date had been set for three months from now.

QUESTIONS TO THE PANEL

1. Is the airway threatened? What are the signs of airway injury?
2. What is the time interval between exposure to super heated air and obstruction?
3. What is the role of steroids?
4. What are the early laboratory manifestations of airway inhalation injury?
5. When to intubate?
6. If I intubate, do I need to ventilate?
7. Are upper airway injury and smoke injury the same clinical entity?

E-06428

ETC 00365

FLUID RESUSCITATION

1. Physiologic Impact of Major Burns

- A. Cardiac Output
- B. Vascular Permeability
- C. Extracellular Fluid Loss
 - Total Fluid Loss
- D. Crystalloid Fluid Loss
- E. Colloid

2. Resuscitation Guidelines

- A. Isotonic Resuscitation
- B. Hypertonic Resuscitation
- C. Colloid-hypertonic Resuscitation
- D. Guidelines Utilizing the Baxter Formula
 - 1. Day One
 - 2. Day Two
 - 3. Days Three - Ten

3. Electrical Injuries

- A. Voltage Effect
- B. Tissue Destruction — "Tip of the Iceberg"
- C. Myoglobinuria
 - Production of lactic acid and myoglobin precipitation in the renal tubules

F-06429

ETC 00366

FLUID RESUSCITATION

Charles R. Baxter, M.D., F.A.C.S.

The guidelines for resuscitation of major burns have changed in the United States during the past decade. The changes have resulted from both research and the establishment of many new burn treatment facilities which have intensified the experience with thermal injuries. It is generally agreed that the principles governing optimal resuscitation are: 1) that in the initial 24-hour burn period an isotonic balanced salt solution (lactated Ringer's) replaces the immense losses of body fluids as effectively as colloid-containing solution and that no other solutions (neither colloid nor 5% D/W) are given in this time interval, 2) plasma expansion can be accomplished with colloid-containing solutions at approximately 24 hours post-burn and 3) that the total time required for resuscitation can be shortened by the rapid reconstitution of plasma volume as soon as leaky capillaries are sealed, i.e. between 24 and 32 hours post-burn. It is emphasized that lactated Ringer's or balanced salt solution is the sole fluid utilized in the first 24 hours, i.e., no 5% dextrose/water as well as no colloid-containing solutions, and that the calculated amount of plasma is given in the fourth eight-hour period, not spread over a period of 24 hours during the second day. Isotonic salt is not needed after 24 hours. The quantity of lactated Ringer's needed in the first 24 hours, may range between 2 and 5 cc/kg/% body burned in individual burn patients. An appropriate approach, in our opinion, is to first start fluid therapy on the basis of 4cc/kg/% burn and to adjust the rate by reduction or addition according to the patient's response. This latter method insures a more rapid alleviation of shock and does not result in administration of excessive fluids. This range of fluid requirements emphasizes that formulae for calculating burn resuscitation fluids are but guidelines and that clinical signs determine the quantity actually given to individual patients. The clinical parameter of urine volume, clear mental status, and an elimination of all signs of shock are used as the end points of resuscitation, altering the total quantity on the basis of the patients' response. More refined indices of optimal resuscitation are the return of the cardiac output to normal within eight to ten hours post-burn, and correction of the metabolic acidosis as determined by pH restoration to normal. The return of oxygen consumption to normal and normal core (rectal temperatures) are also good indices (if the ambient temperature was kept at 92 degrees F). After 24 hours, serial hematocrits are indicative of the plasma volume re-expansion.

The increased fluid requirements of the larger burns have been shown to result from the movement of Na⁺ and H₂O into cells in unburned tissue, most notably skeletal muscle cells. Transmembrane potentials (T_m) were measured using the Ling-Gerard electrode and serial muscle biopsies used to calculate the intra- to extracellular distribution of electrolytes and water. Burns less than 40% of the body surface (Group 1) had an initial depression of T_m which was transient and rapidly approached normal by 48 hours post-burn. The internal distribution of sodium is significantly different in the larger burns (Group 2). They had a depressed T_m and remained at a slightly sub-normal level for the seven-day period of the study. The persistence of the high-intracellular Na⁺ and low-intracellular K⁺ is not totally explicable on the basis of the Nernst equation. The measured T_m's in the Group 2 burns were much lower than the T_m predicted by the Nernst equation. T_m responses indicated an increase in the cell permeability to sodium which persists throughout the length of the study. Most major burns exhibited an increase in sodium permeability from a normal 0.01 to between 0.02-0.04. These studies suggest that initial defect in ATPase function rapidly returns to normal in the burns below 40% TBSA, but in larger burns the major difficulty lies in the slow channels of sodium transport. The clinical implications are that body weight does not reflect mobilized extracellular fluid which can readily be returned to normal by excessive excretion thereby negating measurements of body weight as indices of fluid mobilization while at the same time explaining why additional sodium and water may be needed for these patients after the initial resuscitation.

F-06430

ETC 00367

CASE REPORT — FLUID RESUSCITATION

A nineteen year old girl is admitted to the hospital following a laboratory explosion and fire. Alcohol was ignited by a Bunsen burner resulting in burns of the face, neck, chest and both arms.

Physical examination revealed a restless patient complaining of pain in the throat and hands. There are burns of the face with singeing of the eyebrows and nares. Her laboratory garment is attached to the underlying burn skin. Burns of both hands and arms are full thickness. Her body weight is 60 kg.

Initial stabilization is carried out with the insertion of two longwell catheters and infusion of lactated ringers solution. The patient is receiving oxygen by mask at 6 L./min.

Medical history obtained from the family indicates no allergies, sensitivities or significant medical illnesses. The patient is engaged and a wedding date had been set for three months from now.

QUESTIONS TO THE PANEL

1. Assuming this patient is 60 kg. and has a 40% body surface burn, outline your resuscitation guidelines.
2. Is hypertonic resuscitation indicated in this patient?
3. What about the new recommendations of albumin and hypertonic solutions?
4. This patient will receive 9,600 cc. of fluid in the first 24 hours. Isn't fluid overload a real possibility?
5. Do the fluid requirements including both fluid load and composition remain the same on post burn day two?
6. What about colloids and blood?
7. How do I calculate fluid requirement in electrical injuries?

BURN WOUND CARE

- 1. Debridement**
 - A. Tangential Excision
 - B. Total Excision
 - C. Enzymatic Debridement
- 2. Biologic Dressings**
- 3. Homograft**
- 4. Skin Substitutes**
- 5. Skin Grafting**
- 6. Criteria for Grafting**
 - A. Mesh vs Sheet Graft
 - B. Grafting the Face
 - C. Grafting the Hand
 - D. Caring for the Graft

F-06432

ETC 00369

BURN WOUND CARE

William P. Curreri, M.D., F.A.C.S.

Early debridement of the burn wound and timely closure of the wound with skin graft is highly desirable. Early closure of the wound not only prevents subsequent infection, but decreases the hypermetabolic response to burn injury thus minimizing the nutritional requirements. In general the wound may be most rapidly readied for definitive grafting by employing either tangential excision, total excision of the burn tissue down to the level of investing fascia, or with the use of chemical or enzymes. The advantages and disadvantages of each will be discussed and the methods utilized described. In addition, it must be emphasized however, that with rapid debridement of the burn wound, there is a mandatory requirement for immediate closure.

Several materials have been utilized to obtain closure of the burn wound including the use of biologic dressings, synthetic skin substitutes, and definitive autograft. If possible the patient should be grafted with his own skin immediately, providing sufficient donor sites exist. In the case of tangential excision or enzymatic debridement, frequently the wounds can be temporarily closed with homograft or procine heterograft. The current state with regard to preparation of such skin substitutes as well as storage will be reviewed.

In general, definitive autograft may be either applied as sheets, in which the best cosmetic appearance may be obtained, or the autograft may be meshed. The latter process allows for the expansion of the skin to cover large areas when there are limited donor sites and provides for drainage of fluid from under the graft which may, if excessive, prevent autograft adherence. In general, sheet graft is preferred over areas exposed to recurrent trauma such as the foot, the popliteal space, the antecubital space, and the neck. In addition, sheet graft is usually preferable on the face since it is associated with less scarring and a smoother appearance. The techniques for harvesting skin and caring for the graft will be reviewed.

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AMBULATORY BURN CARE

- I. PRINCIPLES
 - A. APPLICATION: MINOR AND MAJOR BURNS
 - B. IMMEDIATE RESUSCITATION
 - C. WOUND CARE
 - DAILY CARE
 - PERIODIC PHYSICIAN MONITORING
- II. IMMEDIATE RESUSCITATION
 - A. REMOVE CLOTHING
 - B. STOP BURNING PROCESS
- III. WOUND CARE
 - A. DEBRIDEMENT
 - SOAP, WATER AND SCRUB
 - B. ANTIBIOTIC AND DRESSING
 - SILVADENE IMPREGNATION ON GAUZE
 - FLEXINET DRESSING
 - C. BIOLOGIC DRESSINGS
 - PORCINE
 - HOMOGRAFT
 - SYNTHETICS
 - HYDRON
 - BIOBRANE
 - D. DAILY CARE
 - DAILY WOUND DRESSING
 - PERIODIC PHYSICIAN EVALUATION

E-06434

ETC 00371

AMBULATORY BURN CARE

Robert W. Gillespie, M.D., F.A.C.S.

Ambulatory burn care can be accomplished in the physician's office or in the hospital emergency department in an expeditious manner for the patient with minor burns and selectively for major burn patients. The goals of ambulatory burn care are to minimize infection, reduce complications and expedite healing. Ambulatory burn care can be accomplished by a team approach utilizing a member of the physician's office staff or the nursing staff in the emergency department to provide the daily burn care supplemented by periodic evaluation by the physician.

The principles of ambulatory care are similar to those utilized in major burn management, namely, immediate treatment and definitive burn wound management. The principles of immediate treatment in the minor burn patient are to stop the burning process, eliminate contamination and control pain. The burning process may be arrested by removal of the clothing in the area of burn, immersion of the burn area in cool water and physical separation of the burn from the burning process. Contamination can be minimized by deferring the application of any topical dressing until the burn has been assessed and debridement has been initiated. Pain is readily controlled by isolating the burn from the injurious effects of the environment. Fluctuations in air temperature and air currents are painful to the patient. Isolation of the burn by covering with a clean moistened cloth will effectively control pain. The application of ice to the burn surface is contraindicated. Ice is vasoconstrictive and may result in the transition of a partial thickness burn to a full thickness burn.

Definitive burn wound care is based upon elimination of the eschar and promotion of epithelialization. Debridement can be easily accomplished daily by the gentle brushing of the burn wound or washing with a soap water and cloth application. Others have utilized enzymatic debridement with variable success. Following the daily process of debridement, antibiotic dressings are applied. Antibiotic dressings serve to reduce the bacterial flora. Our procedure is to impregnate fine mesh gauze with Silvadene and secure it with a flexinet dressing.

The role of biological dressings and skin substitutes in the minor burn wound depends upon their availability and cost effectiveness. The utilization of these dressings in ambulatory care of the major burn has rather broad application particularly in the partial thickness burn. In these situations epithelialization appears to be accelerated and wound sepsis appears to be reduced.

E-06435

ETC 00372

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EPICHLOROHYDRIN

DESCRIPTION

$\text{CH}_2\text{OCHCH}_2\text{Cl}$, epichlorohydrin, is a colorless liquid with a chlorine-like odor.

SYNONYMS

Epi. chloropropylene oxide, 1-chloro-2,3-epoxypropane, chloromethyloxidrane, 2-epichlorohydrin.

POTENTIAL OCCUPATIONAL EXPOSURES

Epichlorohydrin is used in the manufacture of many glycerol and glycidol derivatives and epoxy resins, as a stabilizer in chlorine-containing materials, as an intermediate in the preparation of cellulose ethers and ethers, paints, varnishes, nail enamels, and lacquers, and as a cement for celluloid.

A partial list of occupations in which exposure may occur includes:

Cellulose ether workers	Lacquer makers
Epoxy resin makers	Nail enamel makers
Glycerol derivative makers	Organic chemical synthesizers
Glycerophosphoric acid makers	Paint makers
Glycidol derivative makers	Resin makers
Gum processors	Solvent workers
Lacquers	Varnish makers

PERMISSIBLE EXPOSURE LIMITS

The Federal standard is 5 ppm (19 mg m⁻³). NIOSH has recommended a time-weighted average limit of 2 mg m⁻³ with a ceiling concentration of 19 mg m⁻³ based on a 15-minute sampling period.

ROUTE OF ENTRY

Inhalation of vapor, percutaneous absorption of liquid

HARMFUL EFFECTS

Local—

Epichlorohydrin is highly irritating to eyes, skin, and respiratory tract. Skin contact may result in delayed blistering and deep seated pain. Allergic eczematous contact dermatitis occurs occasionally.

Systemic—

The earliest symptoms of intoxication may be referable to the gastrointestinal tract (nausea, vomiting, abdominal discomfort) or pain in the region of the liver. Labored breathing, cough, and cyanoses may be

evident and the onset of chem after exposure. Animals exposed developed lung, kidney, and liver

MEDICAL SURVEILLANCE

Consider possible effects in preplacement or periodic

SPECIAL TESTS

None currently used.

PERSONAL PROTECTIVE MEASURES

Goggles and rubber, or chlorohydrin slowly penetrate should be thoroughly washed, concentrations.

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ETHYLENE OXIDE

DESCRIPTION

H_2COCH_2 , ethylene oxide

SYNONYMS

1,2-Epoxyethane, oxirane

POTENTIAL OCCUPATIONAL

Ethylene oxide is used as ethylene glycol, polyglycols, gl nitrile, plastics, and surface-act for foodstuffs and textiles, an especially for surgical instrum

A partial list of occupation

- Acrylonitrile makers
- Butyl cellosolve makers
- Detergent makers
- Disinfectant makers
- Ethanolamine makers
- Ethylene glycol makers
- Exterminators
- Foodstuff fumigators
- Fumigant makers

PERMISSIBLE EXPOSURE LIM

The Federal standard is

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evident and the onset of chemical pneumonitis may occur several hours after exposure. Animals exposed repeatedly to this chemical have developed lung, kidney, and liver injury.

MEDICAL SURVEILLANCE

Consider possible effects on the skin, eyes, lungs, liver, and kidney in preplacement or periodic examinations.

SPECIAL TESTS

None currently used.

PERSONAL PROTECTIVE METHODS

Goggles and rubber, protective clothing should be worn. Epichlorohydrin slowly penetrates rubber, so all contaminated clothing should be thoroughly washed. Respirators are required in areas of vapor concentrations.

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 Shell Chemical Company: 1972, 'Epichlorohydrin' — *Industrial Hygiene Bulletin*, Shell Chemical Company, New York.

ETHYLENE OXIDE

DESCRIPTION

HCOCH_2 , ethylene oxide, is a colorless gas with a sweetish odor.

SYNONYMS

1,2-Epoxyethane, oxirane, dimethylene oxide, anpropylene

POTENTIAL OCCUPATIONAL EXPOSURES

Ethylene oxide is used as an intermediate in organic synthesis for ethylene glycol, polyglycols, glycol ethers, esters, ethanolamines, acrylonitrile, plastics, and surface-active agents. It is also used as a fumigant for foodstuffs and textiles, an agricultural fungicide, and for sterilization, especially for surgical instruments.

A partial list of occupations in which exposure may occur includes:

Acrylonitrile makers	Fungicide workers
Barelcellulosolve makers	Gasoline sweeteners
Detergent makers	Grain elevator workers
Disinfectant makers	Organic chemical synthesizers
Ethanolamine makers	Polyglycol makers
Ethylene glycol makers	Polyoxirane makers
Exterminators	Rocket fuel handlers
Foodstuff fumigators	Surfactant makers
Fumigant makers	Textile fumigators

PERMISSIBLE EXPOSURE LIMITS

The Federal standard is 50 ppm (90 mg/m³).

E-06437

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