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BURNS BIBLIOGRAPHY

1952 - 1962

T. G. Blocker, Jr. M.D.
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June 25, 1962 - June 24, 1963

Department of Surgery
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USPHS CONTRACT
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BURNS BIBLIOGRAPHY

1952 - 1962

JUNE 25, 1962 - JUNE 24, 1963

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OCD REVIEW NOTICE

This report has been reviewed in the Office of Civil Defense and approved for public release. Approval does not signify that the contents necessarily reflect the views and policies of the Office of Civil Defense.

This report is one of five publications resulting from a study on "Evaluation of Burn Control and Treatment of Mass Burn Casualties," prepared under the direction of The Division of Health Statistics, Public Health Service, Department of Health, Education, and Welfare:

1. Simplified Standardized Treatment of Burns...
2. Workbook on Complicated Burn Cases
3. Newer Trends in Burn Research...
4. New Concepts in Burn Physiology and Burn Treatment
5. Burns Bibliography 1952 - 1962

INTRODUCTION

A preliminary bibliography on burns was prepared by the National Library of Medicine in conformity to a request from Garruth Wagner, M. D., Chief, Division of Health Mobilization and John J. Lang, M. D., Chief, Research Branch, Division of Health Mobilization. Seven hundred sixty-nine references were selected by Dorothy Bocker, M. D., the Medical officer who worked on the project, after an inspection of approximately 2,000 articles.

All references were checked with the actual articles for accuracy, co-authors' names, which were omitted in the original lists, were added, and short abstracts were prepared. A group of references which were not available in the library of the University of Texas Medical Branch for one reason or another have been included with the notation "Not reviewed. Available in the National Library of Medicine." A large number of additions were made to the bibliography as the result of a review of the literature in preparation for a chapter in Progress in Surgery, edited by Allgöwer (Progress in Burn Physiology and Treatment) and also for a chapter on Burns in the forthcoming textbook edited by John Converse. Papers presented at the First International

Congress on Research in Burns, in Washington in 1960, which were published in 1962, were also added to the series, as were a number of 1962 articles unpublished at the time of Dr. Bocker's work and other more recent publications which we felt would be of value for general reference purposes. To expedite the completion of the contract within the time limit set, it was decided not to prepare abstracts of translations of articles in German, Italian, Finnish, and Russian, etc., which were unavailable in abstract form in English. It is planned, however, to proceed with this work apart from the contract and eventually to prepare abstracts of all articles included herewith.

In addition to this bibliography, which has been organized according to general subject matter, following, in general, the categories submitted, a duplicate file has been prepared on index cards and alphabetized according to the senior author for ready reference and for convenience in keeping the file up to date from year to year by agencies interested in problems of thermal trauma and mass casualty preparation. Co-author's names have been added to the file.

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D
TEXTS, MONOGRAPHS AND REVIEWS OF THE LITERATURE
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I

TEXTS, MONOGRAPHS AND REVIEWS OF THE LITERATURE

1. Allgöwer, M., Sieglist, J. Burns-Pathophysiology, Pathology, Clinical Therapy 318 p. Springer-Verlag, Berlin, Heidelberg, 1957.

General text in German by well-known Swiss authority.
Standard European reference Extensive Bibliography.

- -

2. Artigas, N.R. The burned child: Therapeutic Regimen, National Health Service, Santiago, Chile. 1962.

Regimen of management of pediatric burns at the Hospital "Manuel Arriaran" in Santiago. Well organized manual in Spanish, with charts, dosage tables and sections on anesthesia, dietary measures, intravenous techniques, tracheotomy, psychological treatment, physiotherapy, social service aspects, hospital charts.

- -

3. Arturson, G. Pathophysiological aspects of the burn syndrome, with special reference to liver injury and alterations of capillary permeability. Acta Chir Scand. Suppl 274 5-135, 1964. 346 refs.

Monograph based upon experimental studies at the University of Uppsala. Includes 1) biochemical and histochemical studies of the rat liver, 2) alterations in capillary permeability in burned and non-burned areas of the dog, 3) observations on permeability of

the glomerular membrane in man, and discussion
of causative mechanisms of burn shock.

- -

4. Artz, C., Reiss, E. The treatment of burns. Philadelphia, Saunders, 1957. 250 p.

Standard textbook for students and practitioners by
well known authorities in the field of burns. Based
upon wide experience at the Surgical Research Unit,
Brooke Army Medical Center.

- -

5. Artz, C. P., editor, Research in Burns, AIBS, Pub No. 9,
Washington, D. C., 1962.

Proceedings of First International Symposium on
Research in Burns, Washington, D. C., 1960

- -

6. Benaim, F. Emergency Treatment of Severe Burns, Institute of
Burns and Plastic Repair, Buenos Aires, 1962. 62 refs.

Handbook in Spanish by well-known authority for first-aid
and emergency treatment of burns, including detailed
lists of supplies, equipment and patient record forms.

- -

7. Birke, G., Liljedahl, S.O.; Troell, L. Studies on burns. Acta Chir Scand, Suppl 228:1-63, 1957.

Monograph reporting studies at Karolinska Institute in 3 sections: I. The Primary Treatment with Special Reference to the Mortality and Hospitalization Time, II. Dextran Concentration, Electrolytes, Blood Volume and Total Hemoglobin, III. The Serum Protein Pattern and Nitrogen Metabolism.

- -

8. Bland, J.H. Disturbances of the body fluids, clinical recognition and management. 2nd edition. Philadelphia, Saunders, 1956. 522 p. Trauma, burn and shock. p. 226-9. Burns, p. 313-9.

Text directed at student resident and practitioner.
Section on Surgical Metabolism edited by Francis Moore and Albert Mackay.

- -

9. Blocker, T.G., Jr., Blocker, V. New Concepts in Burn Physiology and Burn Treatment, in Progress in Surgery, edited by M. Allgöwer, 3:70-101, Karger, Basel/New York, 1963. 176 refs.

Review of 5-years of clinical research in burns and 10-years of fundamental research in burns, shock and wound healing.

- -

10. Blocker, T.G., Jr. Burns, Chapter in Textbook of Plastic Surgery, by American Authorities, edited by J.M. Converse, W.B. Saunders Company, Philadelphia/London, in press, 1963.

Material compiled from standpoint of residency training in Plastic Surgery. History of burn therapy, incidence, etiology, diagnosis, morbidity, mortality, systemic response, immediate hospital care, management of the subacute burn, grafting, principles of definitive care.

- -

11. Chasmar, L.R., Woolhouse, F.M. A review of the literature on burns and wounds, November, 1955 - November, 1956. Canad Se Med J 13.1, 1957. 109 refs.

General review of literature on burn therapy and research, acute body injury, blood vessel replacement shock, blood and plasma volume expanders, enzymes, metabolism and nutrition, fat embolism, tetanus, infection and antibiotics.

- -

12. Clarkson, P. Burns. *Lancet* 2 869-70, 1960

Report of papers given at First International Congress on Research in Burns, Washington, D.C., 1960. Brief abstracts.

- -

13. Clarkson, P. Burns, Critical Review. Brit J of Surg 50 458-486, 1963.

Review of burn literature, 1950-1960, according to mortality, prevention, pathology, clinical course, early treatment, surgical programme, infection, immunotransfusion, homografts, fractures and bone changes, special areas, late repairs and keloids, burns in Russia, effects of thermal trauma combined with total body radiation.

- -

14. Cloutier, A.M., Woolhouse, F.M. A review of the literature on burns and wounds. Med Serv J Canad 12:301-13, 1956. 57 refs.

Annual review of literature on burns and wound healing prepared for Canadian Armed Services general and local therapy, nutrition, homografts electrical burns, mass casualties, experimental research in burns, therapy and infection of wounds, frostbite, experimental nutritional studies.

- -

15. Davis, J.H., Abbott, W.E. The pathology of thermal burns arising concepts. Surgery 40 768-806, 1956. 104 refs.

A review of the literature since 1945.

16. Davis, L., editor, Christopher's Textbook of Surgery, 7th edition, W. B. Saunders Company, Philadelphia, 1960.

Chapter on Thermal and Irradiation Injuries (pp 182-213)
written by Bell, J. (Burns and Irradiation), Lewis, R. B.
(Local Cold Injury) and Leroy, G. V. (Nuclear Radiation
Injuries).

- -

17. Francke, K. The treatment of burns and freezing on the basis of war and postwar experiences. Munich. Inaug Dis-Ludwig-Maximilians-Univ 137 p., 1957.

Not reviewed. Available in the National Library
of Medicine.

- -

18. Godefroid, T. Auto-inflammation after burns. Bruxelles, Asocia, 191 p. 1958. 300 refs.

Not reviewed. Available in the National Library
of Medicine.

- -

19. Hardy, J. D. Pathophysiology in Surgery, The Williams and Wilkins Company, Baltimore, 1958. The Pathophysiology of Thermal Burns, 151-168.

Outline of types of thermal injury, general systemic response and principles of treatment. Detailed study of recent progress and developments in the field of thermal trauma, including fundamental research.

- -

20. Haynes, B. W., Jr.; Thermal, Chemical and Electrical Injuries, Chapter in Christopher's Minor Surgery, 8th edition, pp 160-176, edited by Alton Ochsner and Michael E. DeBakey, W. B. Saunders Company, Philadelphia/London, 1959.

Summary of burn pathophysiology and regimen at the Medical College of Virginia.

- -

21. Hellstrom, J. G. Vitamin E--a general review of the literature with an assessment of its role in the healing of burns and wounds. Med Serv J Canad 17:238-68, 1961. 113 refs.

Historical review of Vitamin E research followed by chemistry, biological activity, commercial preparations, methods of assay, metabolism, distribution and intake, physiopathology, human requirements and role in healing of wounds and burns.

- -

22. Jackson D.M. Burns in Emergency Surgery, edited by Hamilton Bailey, John Wright and Sons, Ltd., Bristol, 1958.

Summary of general principles according to Birmingham regimen.

- -

23. Körlof, B. Infection of burns. Part I. A bacteriological and clinical study of 99 cases. Part II. Animal experiments, burns and total body X-irradiation. Acta Chir Scand, Suppl 209, 1956. 144 p.

Comprehensive study from University of Uppsala, including in Part I a review of therapy, discussion of streptococcus pyogenes (beta hemolytic strep.), staphylococcus aureus, pseudomonas pyocyanea, proteus, minor and mixed infections with reviews of literature and author's studies in 99 patients. Part II, discusses materials, methods and data with regard to guinea pigs experiments employing thermal trauma, X-irradiation and experimental invasive infection alone and in various combinations. Reviews of the literature included in each section.

- -

24. Levenson, S.M., Lund, C.C. Thermal burns. 1-47, 1957. The Year Book Publishers, Inc., Chicago 1957.

Monograph covering therapeutic routines at Walter Reed Army Institute of Research and status of knowledge of burn problems generally.

- -

25. Liedberg, C. F. Infection in burns. University of Lund, 1961.

Monograph summarizing previous studies on infection and related problems in burns.

- -

26. Maxmen, M. D., Farmer, A. W. A summary of the recent literature on burns and wounds. Med Serv J Canad 11:213-37, 1955. 147 refs.

Review of literature on thermal burns and wounds and trauma prepared under auspices of Canadian Defense Research Board (first of annual reviews in Medical Service Journal of Canada).

- -

27. Miller, H. S. A review of the literature on burns and trauma, October 1959 to September 1960. Med Serv J Canad 17:148-78, 1961. 604 refs.

Annual review of English literature on burns and trauma prepared for the panel on Management on Burns and Wounds of the DRB Panel of Canada.

- -

28. Moore, F. Metabolic care of the surgical patient. W. B. Saunders Co. Philadelphia, 1959. Chapter on Burns, 868.

Discussion on burn management on the basis of 4 phases:
1) Burn edema, 2) The wound, 3) The upswing, and
4) maturation of new skin and rehabilitation. Sections
on the troublesome variants, notes from the literature,
case histories and atomic injury.

29. Morton, K. S. A review of the literature on burns and trauma, October 1956 to September 1957. Med Serv J Canad 14, 79-110, 1958.

Annual review of literature prepared for Canadian Defense Research Board, continuation of previous reviews. Introduction lists journals surveyed for first time (all in English language). Burn therapy, radiation, research. Also wound healing, shock, trauma.

30. Morton, K. S. A review of the literature on burns and trauma, October 1957 to September 1958. Med Serv J Canad 15 1-41, 1959, 442 refs.

Annual survey of English literature pertaining to Burns (Treatment, complications, electrical and radiation, research, intravenous fat emulsions, emergency rooms and mass casualties), Trauma, wounds, and wound healing.

31. Morton, K.S. A review of the literature on burns and trauma October 1958 to September 1959. Med Serv J Canad 16:63-90, 1960. 507 refs.

Continuation of previous reviews of English language journals on burns, wounds, shock, etc.

- -

32. Moyer, C. Burns in Surgery Principles and Practice, edited by Harkins, H.N., Moyer, C., Rhoads, J.E. and Allen, J.G., 2nd edition, J.B. Lippincott Company, Philadelphia/Montreal, 1961.

Classification, history, disturbed physiology and therapeutic principles.

- -

33. Muir, I.F.K., Barclay, T.L. Burns and their treatment. Year Book Medical Publishers, Inc. Chicago, 1962.

New handbook on burns by British authors. Contents include scope and treatment of burn shock, local treatment, general care of patients with burns and scalds, burns of special areas and types, out-patient treatment of minor burns scars and contractures, administrative problems, mass casualties.

- -

34. Ravdin, I. S. Current status of the therapy of burns. JAMA 171:1357-8, 1959.

Review of present trends with emphasis upon vigorous supportive care, mechanical cleanliness, gentleness in care, use of whole blood as indicated with salt-solutions and other colloids, early grafting, light, safe anesthesia.

- -

35. Sevitt, S. Burns pathology and therapeutic applications. London, Butterworth and Co., 364 p., 1957.

Standard reference text covering biophysics of burns, histopathology, classification and healing criteria, mortality, shock, toxemia, metabolic, endocrine and individual organ response, complications and specialized types of thermal trauma.

- -

36. Stark, R. Plastic Surgery, Harper and Row, New York, 1962.

Section on fluid and electrolyte therapy in Burns written by J. F. Eagle (pp 172-182) and section on Surgical Treatment of the Burn Portal written by C. R. DeHaan (pp 182-192).

- -

37. Tamerin, J. A. What's new about thermal burns. New York J Med 60 1472-81, 1960. 77 refs.

Detailed summary of present status of burns including the following subjects: prevention, prognosis, Civilian Defense planning, replacement fluids, complications, debriding agents, early excision, grafting and homo-grafting, nutrition, hydrotherapy and present status of research.

- -

38. Turnbusch, W. T. Treatment of Facial Burns in Plastic and Reconstructive Surgery of the Eye and Adnexa, Butterworths, Washington, 1962.

Outline of early management and principles of reconstructive surgery.

- -

39. Wallace, A. B. Practitioner (Supplement) 189:527-536, 1962.

Discussion of recent trends in surgery of cleft lip and palate, ear deformities, cancer, plastic surgery techniques and burns, with emphasis in the latter section on the work of Derganc and Hinshaw on depth of burn, Cope, respiratory tract injury, Fozzard, myocardial injury, Moyer, thermo-regulation, Batchelor, resuscitation of the burned child, Topley, burn anemia, Jackson, MacMilland and Altemeier, extensive primary excision, Feodoro, and Skurkovitch, immunotherapy, and Blocker, convalescent serum.

- -

40. Weller, S. Treatment of severe burns, collected references from the Anglo-American literature. Muenchen Med Wschr 100 317-21, 1958.

Not reviewed. Available in the National Library of Medicine.

- -

41. Wornack, N. A., editor, On Burns, Charles C. Thomas, Springfield, Illinois, 1953. 178 pages.

Papers from a Symposium on Burns held at the University of Iowa. Participants: Ziffren, Cullen, Blocker, Barrett Brown, Altmeier, Butterfield, and Bruner.

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II

GENERAL CLINICAL STUDIES

II

GENERAL CLINICAL STUDIES

1) PEDIATRIC THERAPY

1. Adan Ligorit, R. Current treatment of burns in children and their sequelae. Acta Paediat Esp 19:122-34, 1961.

Not reviewed. Available in the National Library of Medicine.

- -

2. Alson, H.S.; Day, S.E. AMA Arch Surg. 72:788, 1956.

Prevention and therapy of burns in children with emphasis on closed methods, surgical excision of eschar and early grafting.

- -

3. Antila, L. Fluid therapy and post-therapy observations of burns in children. Duodecim 75:453-60, 1959. 21 refs.

Not reviewed. Available in the National Library of Medicine.

- -

4. Agusti, Y. The red and white blood count in cases of burns in children. *Afr Franc Chir* 2 279-82 1953.

Short article based on case reports.

- -

5. Batchelor, A.D.R., Sutherland, A.B., Kirk, J., Colver, C.G. Sodium Balance in Burned Children, in *Research in Burns*, edited by C.P. Artz, AIBS, Pub No 9, Washington, D.C., 1962.

Report of sodium balance studies in 16 children (Edinburgh) indicating variation in initial urinary sodium retention in magnitude and duration with correlation more with the size of the child than with extent of burn. Discussion of early exudate sodium loss and late loss through open wounds.

- -

6. Batchelor, A.D.R., Kirk, J., Sutherland, A.B. Treatment of shock in the burned child. *Lancet* 1 123-7, 1961. 10 refs.

Article from Burns Unit at Edinburgh on initial therapy including statistics on 81 cases. The critical burn area in a 12-year-old child is listed as 15%, 8% in an infant.

- -

7. Beau, A., Prevot, J. Full-thickness burns extending over more than 50% of the body surface in a 5-year-old child. Rev Med Nancy 86:371-8, 1961.

Case report of child treated with local hydrocortisone.

- -

8. Becker, J.M., Artz, C.P. The treatment of burns in children. AMA Arch Surg 73:207-15, 1956. 29 refs.

General and statistical article by Artz and associate covering experiences with 85 children in a 5-year period at the Surgical Research Unit, Brooke Army Medical Center.

- -

9. Beyer, P., Stoessle, E.; Kober, F. Adrenal hemorrhage after a slight burn in a child presenting an agenesis of the spleen. Arch Franc Pediat 16:818-21, 1959. 14 refs.

Interesting case report.

- -

10. Bilick, G.L. On the treatment of burns in children under ambulatory conditions. Zdravookhr Kazakh 22(9):68-71, 1962.

Not reviewed. Available in the National Library of Medicine.

- -

11. Boles, E. T., Jr., Terry, J. L. Practical aspects of the management of severely burned children. *Amer J Surg* 101:668-76, 1961. 9 refs.

Comprehensive article on all aspects of therapy.

- -

12. Chamberlain, J. W., Welch, K., Morse, T. S. The management of burns in children. *Ciba Clin Symposia* 13:3-24, 1951.

Excellent review article on pediatric burns.

- -

13. Crews, E. R. Early electrolyte and colloid therapy in burned infants and children. *Surg Gynec Obstet* 108:726-32, 1959. 5 refs.

Plan for early fluid management. General article.

- -

14. Farmer, A. W. Burns. *The Bulletin of the Hospital for Sick Children, Toronto*, 6 66, 1957.

Discusses special problems of this age group.

- -

15. Farmer, A. W. Management of Burns in Children. Pediatrics 25:886, 1960.

Review of therapy at Sick Children's Hospital in Toronto covering fluid therapy, general care, including nutrition, and surgical processes, tendency toward early debridement in suitable cases.

- -

16. Garbade, F. A., Blocker, T. G., Jr., Lewis, S. R., Wasburn, W. W. The management of burns in children. South Med J 49 1304-07, 1955.

Brief resume' of therapy employing Evans formula for colloids, oral alkaline fluids where possible, exposure treatment as indicated. Details of nutritional program outlined.

- -

17. Hendren, W. H. Symposium on medical emergencies. Treatment of the severely burned child. Pediat Clin N Amer 9:277-96, 1962.

Not reviewed. Available in the National Library of Medicine.

- -

18. Kaye, R., and others. Solutions for and techniques of parenteral, oral and rectal administration. Pediat Clin N Amer 6:301-15, 1959. 9 refs.

Outline of solutions in current use with composition and indications for therapy.

- -

19. Kluge, W. On the modern treatment of burn sickness in children in a district hospital. *Zbl Chir* 86 2489-94, 1961.

Not reviewed. Available in the National Library of Medicine.

- -

20. Matthews, D.N. The Treatment of Burns in Young Children. *Acta Chir Plast* Vol 3, (1) 22-26, 1961.

Report on 250 pediatric burns at Great Ormond St. Hospital. London, over 12 year period. General regimen including Dextran and blood as replacement fluids, exposure therapy where feasible except for hand. Early physiotherapy.

- -

21. Metcoff, J., Buchman, H., Jacobson, M., Richter, H., Jr., Bloomenthal, E.D., Zacharias, M. Losses and physiologic requirements for water and electrolytes after extensive burns in children. *New Engl J Med* 265 101-11, 1961. 35 refs.

Measurement of losses of water, nitrogen and electrolytes. Studies of glomerular filtration, renal plasma flow and osmolar clearances.

- -

22. Pook, H. Cortisone therapy of burns in young children. Zbl Chir 81:2200-6, 1956.

Not reviewed. Available in the National Library of Medicine.

- -

23. Saint-Aubert, P., Pouport, B. Local treatment of burns in children. Ann Chir Infant 2:44-9, 1961.

Not reviewed. Available in the National Library of Medicine.

- -

24. Schmitt, M., Schroeter, P. Hyperpyrexia as a cause of death in burns in infants and small children. J Bruns Beitr Klin Chir 205:240-61, 1962.

Not reviewed. Available in the National Library of Medicine.

- -

25. Schmitt, W. Treatment of burns in infants and children. Aerztl Wschr 11:649-53, 1956.

Not reviewed. Available in the National Library of Medicine.

- -

26. Senz, E.H. Extensive burns in children, treatment of the early phase. California Med 83:362-5, 1955. 7 refs.

Report of general treatment during the early phase following severe burns in children with charts for determining the extent of burn, for parenteral therapy and for maintenance fluids. It is noted that severe shock may develop in infants with burns of 8% or more body surface, and in children with 12% or more.

- -

27. Wolferth, C.C., Jr., Peskin, G.W. Fluid therapy in burns, trauma and shock. Pediat Clin N Amer 6 169-79, 1959. 11 refs.

Practical approach to treatment of burns and other trauma. Rationale and program of fluid therapy in burned children. Warning against excessive use of (1) saline, (2) blood, (3) alkalis which may lower ionized calcium and produce tetany. Urges avoidance of (1) potassium until urinary function is adequate, (2) subcutaneous infusions. Advocates nothing by mouth for 48 hours, a balanced salt solution, and small blood transfusions. Chart of intake and output by age.

- -

28. Woodward, J.; Jackson, D. Emotional reactions in burned children and their mothers. Brit J Plast Surg 13:316-24, 1960/61. 1 ref.

Report on excellent results obtained with the use of a specially trained social worker who in a series of home visits interpreted for the family the emotional problems of the burned child following hospitalization and helped also to resolve the mother's own feelings of guilt, inadequacy, etc. Prior to this study it was not realized that a very large number of mothers of burned children required psychiatric assistance as a sequela of the trauma.

- -

29. Woodward, J.M., Parental visiting of children with burns. Brit Med J 5320:1656-7, 1962.

Not reviewed. Available in National Library of Medicine.

- -

2) OTHER CLINICAL STUDIES

1. Andreesen, R.; Kruger, E. (Practical experience in the treatment of serious burns from explosions in the mining industry) Chirurg 23:193-8, 1952.

Not reviewed. Available in National Library of Medicine.

2. Andreesen, R. (Practical appraisal of the treatment of burn sickness) Deutsch Med J 6:169-73, 1961.

Not reviewed. Available in National Library of Medicine.

3. Arduser, H.M.; Pause, B.E. The use of the snorkle tube in treatment of second degree burns to the head, neck, and face. Phys Ther Rev 41:869, 1961.

Immersion of partial-thickness burns in whirlpool second to third day after injury with aid of snorkle tube.

4. Artz, C. P.; Sorooff, H. S. Modern concepts in the treatment of burns. JAMA 159:411-7, 1955.

General article written according to techniques employed at the Surgical Research Unit, Brooke Army Medical Center.

- -

5. Artz, C. P. Clinical Aspects, Summary in Research in Burns, edited by C. P. Artz, AIBS Pub No 9, Washington, D. C., 1962.

General review of clinical papers presented at First International Symposium on Research in Burns, including brief summaries on current research and ideas concerning respiratory tract lesions, septicemia, myocardial failure, initial fluid replacement, metabolic changes following burns, infection, excision and grafting, and preventive measures.

- -

6. Bartlett, L. C. A systematic plan for the early treatment of civilian burns J Int Coll Surg 20:474-80, 1953. 11 refs

Outline of 1953 regimen for early therapy at Winnipeg General Hospital.

- -

7. Blocker, T.G., Jr. Follow-up report of patient with 85%-90% burns. Annual Report, U. S. Army Contract DA-49-007-MD-447, 1955.

Case Report. Patient admitted 11 days after injury without previous therapy. Survival for 2 years. Unpublished data.

- -

8. Blocker, T.G., Jr. Treatment of burns in elderly patients. Geriatrics 12,457-9, 1957.

Geriatrics burns. Study of problems associated with age. Data from the University of Texas Medical Branch.

- -

9. Bühler, J. The general and systematic treatment of severe burns Arch Klin Chr 282:116-20, 1955.

Outline of burn therapy, including use of intravenous novocain solution, Alodan and Phenergan initially, fluids according to Wallace's regimen, early excision and grafting for small demarcated burns.

- -

10. Brena, S. and others. Clinical evaluation of cervicothoracic sympathetic nerve block in the management of burns of the hand. Canad Anaesth Soc J 8:216-21, 1961.

Not reviewed. Available in National Library of Medicine.

- -

11. Briggs, P. R.; Gomez, J. A. Surgery of Burns. J Maine Med Assn 47:138-41, 1956.

General article on therapy emphasizing physical therapy techniques.

- -

12. Broggi, M., Trias, R. Report of a case of severe burns treated by prolonged sleep. Med Clin (Barcelona) 22:108-10, 1954. 6 refs.

Not reviewed. Available in National Library of Medicine.

- -

13. Brown, J. B.; Fryer, M. P. Reconstruction of electrical injuries, including cranial losses with preliminary report of cathode-ray burns. *Ann Surg* 146:342-356, 1957. 20 refs.

Case reports of experiences from a large service
by well-known burn authorities Washington University.

14. Bull, J. P., Jackson, D. M. Treatment of burns. *Brit Med J* I:1018-20, II:1078-80, 1952.

General review article of overall therapy at
Birmingham Accident Hospital.

15. Cockshott, W. P. The History of the treatment of burns. *Surg Gynec Obstet* 102:116-24, 1956. 28 refs.

A history of burn therapy, beginning with the early
Greeks and Romans and including notes on Wm. Clowes,
who wrote the first book devoted to burns in 1591;
Richard Wiseman; David Cleghorn; Sir James Earle;
Edward Kentish, Curling, James Syme, and Joseph
Lister.

16. Colebrook, L; Colebrook, V., Bull, J. P.; Jackson, D.M. The prevention of burning accidents; a survey of the present position. Brit Med J 1:1379-1386, 1956. 9 refs.

Prevention of burns: data pertinent to incidence of preventable burns, particularly in Great Britain, with emphasis on accidents in children.

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17. Connell, J.F., Jr.; Bowe, J.J.; Del Guercio, L.; Rousselot, L.M. Evaluation of present day concepts in the treatment of the severely burned patient. Amer J Surg 93:694-701, 1957. 11 refs.

General review article with data on 233 patients (8% mortality), 14 of 19 deaths attributed to septicemia.

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18. Conti, R. (Observations on the pathogenesis and treatment of burns) Rev Med Moyen Orient 18 191-6, 1961.

Not reviewed. Available in National Library of Medicine.

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19. D'Alessio, E. (Burns) *Riforma Med* 73:586-92, 1959.

Short general review article.

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20. David, T. A. , Minehart, J. R. , Kornbluch, I. H. Polarized air as an adjunct in the treatment of burns. *Amer J Phys Med* 39:111-113, 1960. 23 refs .

Local Therapy and Systemic Effects. Report from Temple University of employment of polarized air for drying of burn eschar and favorable effect on upper respiratory tract.

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21. Davis, J. H. , Jr. ; Artz, C. P. , Reiss, E. ; Amspacher, W. H. Practical technics in the care of the burn patient. *Amer J Surg* 86 713-17, 1953. 5 refs .

General teaching article based upon regimen at Surgical Research Unit, Brooke Army Medical Center.

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22. Dogo, G. Clinical and biological problems in regard to burns. *Minerva Derm* 35:261-5, 1960. 4 refs.

Not reviewed. Available in the National Library of Medicine.

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23. Dupertuis, S.M.; Musgrave, R.H.: Burns of the hand. *Surg Clin N America* 40:321-30, 1960. Early treatment, subsequent treatment, late treatment. 16 refs.

General article covering principles of treatment of the burned hand during all phases of therapy.

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24. Dupont, C. Burns; local and general changes, immediate and later results, their general treatment. *L'Unione Med Canad.* 85:1047-54, 1956. 23 refs.

Review of burn pathophysiology and outline of treatment at Notre Dame Hospital, Montreal.

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25. Ellmore, L. F. Burn therapy; some controversial aspects. Med Clin N Amer 43 (4):1003-16, 1959. 8 refs.

Discussion of management of severe burns from the internists' view point with particular emphasis upon shock and fluid therapy.

- -

26. Feller, I. Evaluation of therapy in burns by morbidity studies. Amer J Surg 101:413-8, 1961.

Study of morbidity factors in 367 non-fatal burn patients treated at the University of Michigan Hospital 1946-1959, with particular reference to length of hospitalization.

- -

27. Filatov, V. I. Clinical aspects, therapy and prevention of cachexia in burns. Khirurgia (Moskva) 38:15-22, 1962. (Rus)

Not reviewed. Available in National Library of Medicine.

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28. Fujita, G. The mecca of burn research. Clin Surg (Tokyo) 17:1259-61, 1962.

Not reviewed. Available in National Library of Medicine.

29. Fukuda, T. Clinical and Pathologic Experiences with Burns, in Research in Burns, edited by C. P. Artz, AIBS Pub No 9, Washington, D. C., 1962.

Results of study of 77 burn patients with histopathological findings in 26 autopsy cases.

30. Ganopol, G.; Miyahara, R. Hypnosis of the burned patient. Sam Med (B Air) 117:1545-1548, 1960.

Employment of hypnosis in 5 patients with favorable results in terms of improved sleep habits, appetite, joint movements, and decreased pain and apprehension with respects to surgical procedures.

31. Gate, A., Deleuze, R. New techniques in the treatment of massive burns. Presse Med 68:839-40, 1960.

Presentation of two devices employed at Lyon in therapy of extensive burns: a plastic tent as an adjunct to exposure therapy (leaving the head outside) and a new type of small, mechanical dermatome.

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32. Geisthoel, W. Severe burns. Muenchen Med Wechr 98:593-7, 1956. 19 refs.

General management of extensive burns with emphasis upon shock therapy. Report of use of pancreatic enzymes for clinical debridement.

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33. Gumbel, N. S. Preoperative and postoperative considerations in the extensively burned patient. Surg Clin N Amer 39:1583-8, 1959.

Management of the burn patient with respects to scheduling of surgery, preoperative preparation, non-operative considerations, immediate post-operative management and post-operative care of grafts and donor sites.

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34. Gissane, W.; Jackson, D. The principles of the treatment of burns. Ann Roy Coll Surg Engl 10:357-68, 1952. 3 refs

Outline of regimen at the Birmingham Accident Hospital and justification for establishment of Burns Units in Great Britain.

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35. Goulian, D., Jr. Early differentiation between necrotic and viable tissue in burns. Review of the problem and development of a new clinical approach. Plast Reconstr Surg 27:359-73, 1961. 14 refs

Experimental study in rabbits and in one burn patient employing an "Evans blue boundary" technique as an aid in distinguishing full-thickness involved areas in anticipation of early excision and grafting.

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36. Greuer, W. Pathophysiology and therapy of burn disease. Bruns Beitr Lkn Chir 198:257-83, 1959.

A review of literature and author's experience, detailed accounts of systemic and local treatment.

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37. Hagerty, R.F.; Lee, W.H., Jr. The treatment of thermal burns. J South Carolina Med Assn 55:10-17, 1959. 15 refs.

Summary of burn management according to acute, intermediate and definite phases of therapy with use of water-bath tank during dressing procedures.

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38. Hamburg, D.A.; Artz, C.P.; Reiss, E.; Amspacher, W.H.; Chambers, R.E. Clinical importance of emotional problems in the care of patients with burns. New Engl J Med 248-355-9, 1973. 6 refs

Report from the Surgical Research Unit, Brooke Army Medical Center, of experiences with more than 400 burn patients and detailed studies in 12. Adaptive mechanisms displayed included suppression, repression, constriction and denial. During recovery period constructive attitudes were assisted by interpersonal relations with staff, family, other burn patients, reassurance from photographs, realistic planning with regard to social and economic rehabilitation.

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39. Handmann, W. (Burns and regeneration) Klin Mbl Augenheilk 135:353-61, 1959.

Not reviewed. Available in National Library of Medicine.

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40. Heister, R. Pathophysiology and therapy of burns. Med Welt 4:209-14, 1962. 12 refs.

Not reviewed. Available in the National Library of Medicine.

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41. Jackson, D.M. The diagnosis of the depth of burning. Brit J Surg 40:588-96, 1953. 15 refs.

Comprehensive article, including historical review, gross and histological appearance of burns according to depth of involvement and discussion of physical signs of prognostic value.

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42. Jackson, D.M. Diagnosis in the management of burns. Brit Med J 1:1263-7, 1959. 2 refs.

Outline of diagnostic methods for emergency burn therapy: diagnosis of a "shock case;" diagnosis of the colloid requirement; diagnosis of destruction of red cells; diagnosis of renal insufficiency; diagnosis of electrolyte imbalance; diagnosis of bacterial colonization and infection, diagnosis of the depth of burning.

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43. Kaye, B. B. Burns: an outline for treatment. Amer J Surg, 92:123-38, 1956. 77 refs.

General review from the literature of systemic and local therapy (including summary of debriding agents under investigation at the time).

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44. Kucl, S. T. ; Jen, C. Y. Surgical correction of electrical burns of the cranium Zhong Waike Z 10:557-9, 1962.

Not reviewed. Available in National Library of Medicine.

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45. Kirschbaum, S. What should be done and what should not be done in the treatment of burns Rev Sanid Milit Peru 33:38-46, 1960.

Not reviewed. Available in National Library of Medicine.

46. Knudsen, E. T. Lactosuria following burns; a case report. Brit Med J 1:566, 1957. 2 refs.

An interesting case of lactose in the urine following absorption of lactose powder in a topical agent (originally believed to be glycosuria).

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47. Lagrot, F.; Antoine, G.; Bensoussan, H.; La Vergne, E. Burns Algerie Med 63 Vol #9 881-8, 1959.

Not reviewed. Available in National Library of Medicine.

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48. Leclercq, P. The problem of the treatment of burned patients Rev Med Liege 16:164-72, 1961.

Review of burn problems in general (No statistics available for Belgium) and outline of supportive and local therapy with discussion of controversial issues.

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49. Levenson, S.M. Some problems of thermal injury. Postgrad Med 29:592-607, 1961.

Review of current clinical and laboratory research with respect to burns shock, estimate of extent of injury, replacement of fluids, the toxin-antitoxin problem, germ free animal studies, surface therapy, infection, respiratory tract injury, other problems.

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50. Liavag, I. Treatment of severe burn injuries T Norske Laegeforen 79:1228-34, 1959. (5 refs).

Classification of burns and supportive and local therapy according to shock phase, intermediate phase (through healing) and definitive treatment.

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51. Lichtenauer, F. What must the general doctor know about the present day treatment of burns? Ther Gengenw 98:403-10, 1959.

Not reviewed, Available in National Library of Medicine.

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52. Lupton, C.H. Treatment of burns. J Int Coll Surg 17:354-68, 1952. 60 refs.

Description of local therapy with preference for use of an occlusive "pressure" dressing over a sulfonamide ointment; outline of supportive regimen; and principles of skin grafting.

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53. Lynn, T.E. The management of extensive cutaneous burns. JAMA 174:38-43, 1960. 16 refs.

Short general review of accepted methods of burn care.

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54. McLaughlin, C.W., Jr.; Neis, D.K. Recent advances in the management of burns. Amer J Surg 83:746-54, 1952. 29 refs.

General review article covering status of burns in 1952 according to shock phase, toxic phase (including use of ACTH and cortisone), local care, and convalescent phase.

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55. McLaughlin, C. W., Jr. The management of the severely burned. Arizona Med 13:305-9, 1956.

Short review article covering all phases of therapy.

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56. Maneksha, R. J. Management of burns. I Indian J Med Sci 13:625-628, 1959.

Short article on early care covering burn pathophysiology, extent of burn, fluid therapy according to Evans Formula. (Bombay Hospital)

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57. Martin, J. D., Jr. ; Perdue, G. D. The management of thermal burns. The Amer Surg 24:741-746, 1958. 23 refs.

Review of burn pathophysiology fluid requirements, experimental hypothermia research, and complications by staff at Emory University.

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58. Matthews, D.N. Burns. Ann Roy Coll Surg Engl 10:114-28, 1952.
(16 refs).

General review of acute therapy with particular
reference to revival of exposure therapy.

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59. Meybat. Burns; Statistical study, Lille Chir 9:156-9, 1954.

Not reviewed. Available in National Library of
Medicine.

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60. Monsaingeon, A. Note on the treatment of massive burns. Therapie
14:1105-15, 1959.

Not reviewed. Available in the National Library
of Medicine.

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61. Monsaingeon, A.; Derobert, L.; Pinaudeau, Y. The death of burned patients. *Ann Chir* 16:1347-64, 1962.

Not reviewed. Available in the National Library of Medicine.

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62. Moyer, C. A. An assessment of the therapy of burns: A clinical study. *Ann Surg* 137:628-38, 1953. 13 refs.

Mortality study based on probit analysis of data from Parkland Hospital in Dallas, the Homer Phillips and St. Louis City Hospitals and Kankakee Clinic, Illinois during the years 1944-1951.

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63. Moyer, C. A. The treatment of severe thermal injury, its development and accomplishments during the past century. *Western J Surg* 62:107-20, 1954. 22 refs.

Section of 1953 article on assessment of therapy. Analysis of mortality data, summary of local and supportive care, prevention of burns with emphasis on inflammable clothing factors.

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64. Moyer, Carl A. The treatment of burns. Surg 38:806-812, 1955.
5 refs .

General article. Emphasis upon dangers of excess fluid administration in use of formulas. Conclusions with regard to cortisone therapy that it helps to disseminate infections and should be reserved for adrenal cortical insufficiency. Suggestion that sulfasuxidine be given orally to reduce bacterial contamination in perineal and gluteal burns. Warning against overloading with solutes in feeding programs. Thinks 90-150 gm sufficient.

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65. Muller, M. New points concerning the nature and treatment of the effects of burns Deutsch Med Wschr 78:1071-3, 1953. 31 refs .

Not reviewed. Available in National Library of Medicine.

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66. Ogilvie, H. Burns. New Zealand Med J 53:3-9, 1954.

General outline of burn care in each phase with section on burns of conventional and atomic warfare.

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67. Owens, N.; Gorney, M.; Hughes, R.W. Recent trends in the management of burns; a review. *Plast Reconstr Surg* 16:480-90, 1956. 51 refs.

Summary of status in 1956 of burn shock theories, blood and plasma substitutes, exposure vs. closed methods of local treatment, the Reese Dermatorne, fluid and electrolyte studies, enzymatic debriding agents, and ACTH and cortisone therapy.

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68. Pacelli, M. Recent experiences in the treatment of severe burns. *Ann Med Nav (Roma)* 66:43-50, 1961.

Not reviewed. Available in the National Library of Medicine.

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69. Pelly, A.D. The management of the burn illness. *Med J Aust* 49:60-3, 1962. 4 refs.

Mortality data in Australia; early fluid and local care, and notes on surgical management and anticipated outcome of therapy.

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70. Phillips, A. W.; Cope, O. Burn Therapy. I. Concealed progress due to a shifting battlefield. Ann Surg 152:767-76, 1960. 14 refs.

Study of mortality rates from 1939 to 1957 in relation to survival time for fatal burns at the Massachusetts General Hospital. Note that in fatal minor burns other factors than cutaneous injury are at fault. In major burns of less than 90% survival times vary little with extent of lesions. Mortality rates in the first two weeks have fallen. Discussion of factors involved.

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71. Phillips, A. W.; Cope, O. Burn Therapy. II. The revelation of respiratory tract damage as a principal killer of the burned patient. Ann Surg 155:1-19, 1962. 27 refs.

Study of 932 patients at Massachusetts General Hospital, of whom 181 developed respiratory difficulties. In 106 deaths in this series, 46 were attributed in part or wholly to respiratory tract damage.

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72. Phillips, A. W.; Cope, O. Burn Therapy. III. Beware the facial burn. Ann Surg 156:759-66, 1962.

Report from Massachusetts General Hospital on facial burns complicated by respiratory tract injury, especially in lesions sustained by persons in enclosed areas.

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73. Pickrell, K.; Georgiade, N.; Crawford, H.; Maguire, C. General Principles in the treatment of acute burns. Postgrad Med 20:26-40, 1956. 13 refs.

Principles of therapy according to the Duke University regimen (Evans formula with use of blood as part of colloids; occlusive layered dressings; Trilene analgesia; mechanical excision of eschar with emphasis upon special burns and techniques of cutting skin grafts.

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74. Pillsbury, R.D. The treatment of burns. AMA Arch Indust Health 16:422-6, 1957.

Short article on resuscitation and early local care of burns.

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75. Poticha, S.M.; Bell, J.L.; Mehn, W.H. Electrical injuries with special reference to the hand. Arch Surg (Chicago) 85:852-61, November 1962.

Report of 31 patients over a 15-year period at Passavant Memorial Hospital in Chicago. Review of pathology, therapy, complications and reconstructive procedures required.

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76. Rehn, J. (Modern treatment of severe burns Med Welt 2:2629-32, 1961.

Not reviewed. Available in National Library of Medicine.

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77. Rienau, G., and others. Extensive deep burns Toulouse Med 62:539-52, 1961. Diagnosis; therapy; nutrition. 9 refs.

Not reviewed. Available in National Library of Medicine.

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78. Robertson, D. C. The treatment of thermal burns. Canad Med Assn J 75:141-5, 1956. 7 refs.

General article outlining burn regimen with use of hemoglobin and urine volume and specific gravity as guides to fluid therapy; closed treatment with dry dressings.

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79. Romanos, G. J. The treatment of eye burns. Trans Ophthal Soc UK 79:71-9, 1959. '3 refs'.

Paper presented in Symposium on Eye Injuries. Data from East Grinstead between 1940 and 1950 with emphasis upon first-aid therapy of the eyelids and cornea in thermal and chemical (lime) burns and indications for corneal grafts.

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80. Ryan, R. F.; Lorgenecker, C. G.; Vincent, R. W. Effects of pregnancy in healing of burn. Surg Forum 13:483-5, 1962.

Following clinical observation in 2 patients of improved survival following burns and rapid healing during pregnancy animal experimentation was undertaken in 75 pregnant rats with standard burns. Difference observed between these animals and controls were not statistically significant.

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81. Sakson, J. A. A simplified chart for estimating burn areas. Amer J Surg 98:693-4, 1959.

Burn estimation chart from the Cooper Hospital Camden, New Jersey, employing Lund and Browder figures for estimation of surface area percentages.

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82. Scharf, H. Modern views in the treatment of burns. Med Welt 1:49-51, 1961. Albothil (negatan) for burn wound given a 2 year trial; favorable results. 4 refs.

Not reviewed. Available in the National Library of Medicine.

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83. Schmidt-Tintemann, U. Burns and their treatment. Muenchen Med Wschr 101:2147-55, 1959. 67 refs.

General review of present status of burn therapy with outline of management.

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84. Schreus, H. T. Advances in the immediate and late treatment and long-term management of burns. Deutsch Med Wschr 86:340-8, and 353-6, 1961. 6 refs.

Report of experiences in management of acute burns with use of histaminase. Düsseldorf

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85. Schreus, H. T. Therapy of burns with reference to degree and histaminase therapy. *Acta Derm* 56:298-303, 1961.

Not reviewed. Available in the National Library of Medicine.

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86. Shires, G. T.; Riley, F. W.; Baxter, C. R.; McClelland, R.; Stenbridge, V. A. Severe burn. *Texas J Med* 58:828-35, 1962.

Clinicopathologic conference presenting a 50 year old man with second and third degree involvement of more than 45% extent who succumbed to pseudomonas septicemia.

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87. Skerlj, B.; Kulcar, Z. Surface area of body parts and their possible implications in treating burns. *Brit J Plast Surg* 9:165-7, 1956. 6 refs.

Presentation of formulae developed by Skerlj (Professor of Anthropology, University of Ljubljana, Yugoslavia) on the basis of anthropological measurements. Comparison with accepted methods (Wallace, Lund, et al) of estimating percentages of surface area.

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88. Tappeiner, J. Modern pathophysiology and therapy of burns. Wien Klin Wschr 67:619-23, 1955.

General management with emphasis upon early
local and fluid therapy.

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89. Tempest, M. N. A new technique in the clinical assessment of burns. Trans Assn Industr Officers 11:22-6, 1961.

Not reviewed. Available in the National Library
of Medicine.

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90. Thiele, W., Wild, H. Modern therapy of so-called "liquid burns." Praxis 51:1097-9, 1962.

Not reviewed. Available in the National Library
of Medicine.

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91. Tserentsian, D. M. On the problem of the prevention and control of burns. Khirurgia (Moskva) 38:32-4, 1962.

Not reviewed. Available in the National Library
of Medicine.

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92. Va'zquez Arnon, J. L. Burns: General concepts and treatment. Rev Clin Esp 77:134-9, 1960. 13 refs.

Report from East Grinstead (in Spanish) of regimen of management of extensive burns, including use of formulas and both open and closed methods.

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93. Visentini, P.; Gasparotto, A. On the evaluation of edema caused by burns, by measurement of body weight. Boll Soc Ital Biol Sper 37:198-200, 1961. 1 ref.

Not reviewed. Available in the National Library of Medicine.

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94. Vishnevsky, A. V.; Krakovsky, N. I.; Shraiber, M. I. Some problems in the treatment of burns, in Research in Burns, edited by C. P. Artz, AIBS, Pub No 9, Washington, D. C., 1962.

Methods of prevention of pain to spare the burn patient's nervous system additional trauma; the use of novocain block to decrease capillary permeability as well as for its analgesic effects, and other ideas on the local treatment of the burn wound are discussed.

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95. Vishnevsky, A. The role of the nervous system in the development of burn disease and our method of treating it. Transactions of the Intl Soc of Plast Surgeons, The William and Wilkins Co., 1957.

Use of perirenal novocaine blocks and various types of "sleep" therapy as an adjunct to burn therapy; regimen employed at the Vishnevsky Institute, Moscow.

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96. Waisbren, B. A. The medical approach to patients with severe burns. Wisconsin Med J 60:475-80, 1961. 13 refs.

Short article on practical points of care with emphasis on "high-dose" antibiotic therapy systemically and removal of eschar by "dabbing" solutions (combinations of antibiotics in saline). Report of a case who received gamma globulin (daily for 78 days) and one infusion of convalescent burn serum.

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97. Wallace, A. B. Survey of pathology and therapy of burns. Minerva Chir 14:1097-1102, 1959.

Review of regimen as employed for superficial and deep burns in Edinburgh (written in Italian).

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98. Wallace, A. B. A present, (1957) outlook on burns. *Plast Reconstr Surg* 21:243-253, 1958.

Summary of histology, physiology of skin, classification of the burn wound; physiology therapy, and organization of a burns unit.

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99. Wartman, W. D. Mechanisms of Death in Severe Burn Injury: the need for planned autopsies, in *Research in Burns*, edited by C. P. Artz, AIBS, Pub No 9, Washington, D. C., 1962.

Analysis of autopsies of 4 burned patients with suggestion that any complete account of burn injuries and deaths should include adequate and properly collected pathological information, particularly information on the pathology of the respiratory tract.

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100. Wise, C. S.; Letterman, G. S., Schurter, M., Fair, J. E. Physical therapeutic aspects in the treatment of third degree burns. *Arch Phys Med* 36:212-16, 1955. 3 refs.

Detailed physical therapy program for all phases of burn care, including proper positioning, exercise, hydrotherapy, ambulation instruction, massage, etc.

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101. Wolf, C.; Blocker, T.G., Jr.; Lewis, S.R. Psychological studies in burn patients. Annual Report, Army Contract DA-49-007-MD-447, 1961.

A study of burn patient response to injury and hospitalization according to five personality categories. In a series of 47 adults approximately 45% fell into a passive-helpless group and approximately 30% were well-adjusted and cooperative.

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102. Woodley, J. Psychological management with hypnosis for a severely burned girl. Med J Australia 2:153-4, 1959. 1 ref.

Details of a case report with use of hypnosis for relief of pain, improvement of appetite and general morale purposes.

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103. Younger, C., Chacon, E. Burn of the penis. Scrotal plastic surgery of 2 cases. Arch Esp Urol 15:58-65, 1959.

Not reviewed. Available in the National Library of Medicine.

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104. Zettler, F.; Wagner, B. On the treatment of extensive burns Med Klin 56:2209-11, 1961. 27 patients.

Not reviewed. Available in National Library of Medicine.

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105. Ziffren, S.E. Management of the burned elderly patient. J Amer Geriat Soc 3:36-42, 1955. 14 refs.

Burns in elderly patients. Recommendation of sodium chloride and one sixth molar sodium lactate in proportion of 4:1 to replacent normal saline in fluid formulas; experiences in 26 patients. Recommends amputation to be considered with severe burns of lower extremities.

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III

STATISTICAL REPORTS

FROM

HOSPITALS AND BURN CENTERS

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FROM
HOSPITALS AND BURN CENTERS

1. Allgower, M., Pletscher, A.; Siegrist, J.; Walser, A. The treatment of burns: experiences during the years 1932-1955. German Med Month 1:82-90, 1956. 39 refs.

Statistical Data: Report of 76 cases by Swiss burn authority.

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2. Ardizman-Schapiro, J. Burns in Chile, in Research in Burns, edited by C. P. Artz, AIBS, Pub No 9, Washington, D. C., 1962.

Statistical study presented at the First International Congress of Research in Burns, 1956.

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3. Barnes, B. A. Mortality of burns at the Massachusetts General Hospital 1939-1954. Ann Surg 145:210-22, 1957. 18 refs.

Study by probit analysis of 943 burn cases including 86 deaths. Outline of changes in morbidity between 1939 and 1954.

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4. Batchelor, A. D. R. The control of extensive burns. Brit J Plast Surg 6:57-64, 1953-1954. '1 ref

Report of experiences with 400 patients at the Medical College of Virginia and at Royal Hospital for sick children in Edinburgh. General burn regimen outlined.

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5. Bergonzelli, V. Clinical observation on the prevention and general treatment of the burn syndrome. Minerva Chir 12:331-40, 1957. 23 refs

Report from Surgical Clinic of University of Turin with data from 1949-1955 (276 cases) and outline of general regimen with 5% mortality.

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6. Bleck, E. E. Causes of burns in children. A study of full-thickness burns in four hundred fifty-seven patients from the North Carolina Orthopedic Hospital, Gastonia. JAMA 158:100-3, 1955.

Pediatric Burns. Statistical Study with particular reference to etiology.

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7. Blocker, T.G., Jr.; Washburn, W.W.; Lewis, S.R.; Blocker, V. A statistical study of 1,000 burn patients admitted to the plastic surgery service of the University of Texas Medical Branch, 1950-53. J Trauma 1:409-23, 1961.

Statistical study with particular reference to etiology and factors affecting mortality and morbidity.

8. Bull, J.P.; Squire, J.R. A study of mortality in a burns unit. Ann Surg 130:160-173, 1949.

Statistical study. Classical reference article on factors affecting burn mortality. Data obtained from Birmingham Accident Hospital.

9. Bull, J.P.; Fisher, A.J. A study of mortality in a burns unit: a revised estimate. Ann Surg 139:269-74, 1954. 10 refs.

Statistical study of anticipated mortality according to age and extent of burn based on 2807 cases. Revision of 1949 article.

10. Burkhardt, E.; Burkhardt, V. Personal experiences in the treatment of burns. Zbf Chir 85:1338-45, 1960.

Statistical Study of 154 cases (Erfurt) 1954-1958.

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11. Clark, A.G.; Hanson, J.H. Mortality rates in patients with burns; a report on experience at San Francisco City and County Hospital 1943-1956. California Med 89:210-4, 1958. Prognosis. 3 refs

Statistical Data: Review article with data covering 488 hospital admissions and analysis of burn deaths in relation to age, extent, alcoholism.

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12. Clark, A.G. A comparison of methods of treatment of extensive burns at the San Francisco General Hospital. Amer J Surg 102:231-9, 1961. 1C refs

Report of seven cases treated without colloids since previous article.

13. Clarkson, P. Mortality of burns and prevention in England and Wales, in *Research in Burns*, edited by C. P. Artz, AIBS, Pub No 9, Washington, D. C., 1962.

Mortality tables on burns in England and Wales from 1949 to 1959, with the notation that new housing with safe heating would be the best long-term preventive measure.

14. Colebrook, L. The treatment of burns and scalds in a modern burns center. *Triangle* 3:195-201, 1957/58. 20 refs.

Report of procedures employed as routine at the Birmingham Accident Hospital by the founder of the Burns Unit at this institution.

15. Collentine, G. E.; Conway, J. D.; Woloschek, W.; Waisbren, B. Two years' experience in treatment of burns in a private general hospital. *Wisconsin Med J* 61:512-6, 1962.

A review of the initial 2 years of operation of a special burn unit in a private general hospital (St. Mary's, Milwaukee), including notes on the unit area and equipment, number of patients, and treatment.

16. Cope, C.; Phillips, Anne Wight. An analysis of the effect of burn therapy on burn mortality. Research in Burns, edited by Curtis P. Artz, AIBS Pub No 9, Washington D. C., 1962.

Statistical Study of fatal burns at Massachusetts General Hospital from 1939 to 1957 with implication of respiratory tract damages as principal cause of death.

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17. Da Silveira Reis, H. Large burns. Analysis of 325 cases Rev Bras Cir 29:129-39, 1955. Report from surgical clinic of Hospital Getulio Vargas.

Not reviewed. Article available in National Library of Medicine.

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18. Evans, A.J. The early treatment of burns at a regional plastic centre, with a review of 100 cases treated by exposure. Brit J Plast Surg 5:263-74, 1953. 7 refs.

Review of 3 year results in use of exposure technique with outline of general regimen. See also 1957 review.

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19. Evans, A.J. Experience of the burns unit; a review of 520 cases.
Brit Med J 1:547-51, 1957. 4 refs

Report of experiences with 520 burn cases at Basingstoke with particular reference to mortality in patients over 60. Outline of supportive and local therapy (whole blood, dextran, exposure therapy by choice.)

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20. Farmer, A.W.; Lawler, W.R. Review of burn admissions at the Hospital for Sick Children, Toronto, Canada. Plast Reconstr Surg 18:386-401, 1956. 8 refs

A review of mortality figures on 1837 burned children admitted 1942-55 to The Hospital for Sick Children, Toronto, including information on sex, age, area burned, treatment and grafting, length of hospital stay, and a detailed analysis of the 52 deaths which occurred (a mortality rate of 2.8%).

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21. Favuzzi, E. Etiological, clinical and therapeutic statistical data on 193 burned patients hospitalized in the Dermatological Clinic of Perugia in the 3 year period of 1956-1957-1958 G Med Milit 110:71-5, 1960.

Not reviewed. Article available in the National Library of Medicine.

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22. Goodfellow, J. W. A study of the incidence and treatment of burns in a general hospital. Brit J Surg 46:507-11, 1959. 18 refs.

Records of 402 burned patients admitted to the Accident Service of Radcliffe Infirmary, Oxford, during 1942-56, mortality rate 6.9%.

--

23. Griswold, M. L. Treatment of one hundred forty-eight burn cases in a Community Hospital. JAMA 164, 861, 1957.

Statistical review of 148 patients with 5.4% mortality.

--

24. Hitchcock, C. R. ; Horowitz, S. Therapy of severely burned patients. Eleven years' study at the University of Minnesota. AMA Arch Surg 74:485-99, 1957. 41 refs

Statistical review of 170 patients in 11 years with resume of recent advances in supportive therapy.

--

25. Hochleitner, H.; Konrad, J. The treatment of burns at the Innsbrucker Hautklinik during the last 10 years. *Wien Klin Wschr* 73:110-113, 1961. 11 refs

Not reviewed. Article available in the National Library of Medicine.

- -

26. Ingelrans, P., and others. General treatment of burns in the infant. Report of 150 observations. *Ann Chir Infant* 2:39-43, 1961.

Not reviewed. Article available in the National Library of Medicine.

- -

27. Jensen, G.D. Preventive implications of a study of 100 children treated for serious burns. *Pediatrics* 24:623-30, 1959. 7 refs.

General data with particular reference to etiology and implication of parental neglect or carelessness.

- -

28. Josephine, Sister. Burn center: a reappraisal. Hosp Progr 43(2):62-3, and 91, 1962.

A review of the burn center at St. Mary's Hospital Milwaukee, with notes on improvements in the initial physical facilities and therapy made during 2 years of operation.

- -

29. Klein, J. T. New burn therapy center. Hosp Progr 40(12):58-9, 1959.

Notes and photographs of a newly opened (1959) burn therapy center at St. Mary's Hospital, Milwaukee, including information on physical facilities and the appointment of a staff burn team.

- -

30. Lewis, G.K. Burns treated by an open method. Postgrad Med 15:26-31, 1954. 7 refs.

A review of 352 severe burn cases at Cook County Hospital, Chicago, all treated by the open method with notes on etiologic factors, associated injuries, therapy, complications, number of deaths and factors which the author believes contributed to this low mortality rate.

- -

31. Moussier, J.; Sylvestre, J. The burn treatment center in the Lorraine coal-basin Techn Hosp (Par) 18:54-9, 1961.

Not reviewed. Article available in the National Library of Medicine.

- -

32. Petersen, N. C. Treatment of burns. Some experiences from special clinical departments in England and Scotland Ugeskr Laeg 122:828-35, 1960. 37 refs

Not reviewed. Article available in National Library of Medicine.

- -

33. Petrov, B. A. Skin grafting in the treatment of burns, Eighteenth Congress of the International Society of Surgery, 123-30, Munich, 1959.

Classification of burns with statistics on mortality at Sklifosovsky Institute, Moscow. See also Bull Soc Int Chir 18 491-6, 1959.

- -

34. Schreus, H. T., Heinisch, E. On burns from experiences of the Hautklinik der Medizinischen Akademie Duesseldorf for a period of 10 years. *Hautarzt* 12:249-53, 1961. 17 refs.

Not reviewed. Article available in the National Library of Medicine.

- -

35. Spencer, A. D.; McDonald, W. E. The burned Negro in St. Louis. Study of a declining burn rate following urban renewal. *J Nat Med Asso* 55:13-7, 1963.

Not reviewed. Article available in the National Library of Medicine.

- -

36. Sprechler, M.; Backer, O.; Baden, H. Centralized treatment of burns. *Ugeskr Laeg* 122:815-21, 1960. 2 refs.

Report of 2 years experience in a burns center with 515 patients.

- -

37. Stuttgart, G. Today's treatment of severe burns. *Zschr Derm Vener* 8:193-7, 1957. 76 refs.

Review of the literature with report of experience at
the Dusseldorf Dermatological Clinic.

--

38. Sulmmona, M.; Korttila, K. Treatment of burns in children, *Dermatol* 69:327-40, 1953. 105 cases.

Not reviewed. Available in National Library of
Medicine.

--

39. Tempest, M. N. A survey of Domestic Burns and scalds in Wales during 1955. *Brit Med J* 4980:1387, 1956.

Analysis of 116 home accidents with emphasis on
measures for prevention, especially in children.

--

40. Wallace, A. B. Prevention of Burns, Research in Burns, edited by C. P. Artz, AIBS, Pub No 9, Washington, D. C., 1962.

Statistical study of burns and scalds in Scotland, 1855 - 1959 and of Edinburgh Accident Survey, 1957 - 1958 with recommendation for adoption by WHO of a general accident form for collection of information from various countries.

- -

41. Yates, D. E.; Stiles, G. B.; Cowan, R. J.; Langston, R. G. A survey of burns at the Vancouver General Hospital from 1946 to 1955. Can Med Assn J 78:240-245, 1958. 10 refs.

Statistics covering 528 superficial and 252 deep burns (4.2% overall mortality). Review of changes in morbidity in relation to therapy.

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IV

MASS BURN CASUALTIES,
DISASTER PLANNING, RADIATION BURN RESEARCH

IV

MASS BURN CASUALTIES
DISASTER PLANNING, RADIATION BURN RESEARCH

1. Arkawa, E. T. Radiation dosimetry in Hiroshima and Nagasaki atomic bomb survivors. New Eng J Med 263:488-493, 1960. 17 refs.

Mass Burn Casualties--delayed radiation effects in survivors of atomic bombings in Japan. Important article.

- -

2. Armstrong, G. E.; Shaeffer, J. R.; Artz, C. P. Treatment of burns in atomic disaster. U. S. Armed Forces Med J 7:320-6, 1956.

Mass Burn Casualties--General outline by former Surgeon General.

- -

3. Artz, C. P.; Reiss, E.; Davis, J. H.; Amspacher, W. H. The problem of burns in disaster. U. S. Armed Forces Med J 4:39-48, 1953.

Mass Casualty Therapy--Teaching article for armed forces personnel. Revised in later publications of Artz and co-workers.

- -

4. Artz, C. P. Management of mass casualties. Treatment of burns in atomic disaster. U.S. Army Medical Service Graduate School Walker Reed Army Medical Center, Washington, D.C., Pub. No. 553, 1955.

Mass Casualty Therapy. Article by U.S. authority directed toward armed service personnel in training course.

--

5. Battle, R. J. V. Burns: the first five days in the treatment of mass casualties. J Roy Army Med Corps 104:203-8, 1958. 2 refs.

Specific recommendations for treatment of civilian population. Excellent article by well-known British authority.

--

6. Baxter, H.; Drummond, J. A.; Stephens-Newsham, L. G., Randall, R. G. Reduction of mortality in swine from combined total body radiation and thermal burns by streptomycin. Ann Surg 137:450-5, 1953. 11 refs.

Experimental Burns and Radiation Studies. Data from early research in this field.

--

7. Beech, W. Burn casualties from H.M.S. "Indomitable." Brit J Plast Surg 7:303, 1955.

A review of exposure treatment of 35 patients burned in an explosion of aviation gasoline on an aircraft carrier.

- -

- 7a. Berkley, K.M. Studies on the protective effects of clothing in the production of cutaneous flash burns. Surg Gyn Obst 114:483-4, 1962. 1 ref.

Experimental studies in 3000 small burns and 164 large area lesions in pigs (produced by carbon arc) to determine protective effects of clothing. Conclusions: reflectance of material (light colors) is important for protection, as is separation of fabric from skin by an air space. A heavier material affords more protection than a thin one but 2 layers of fabric are better. Fire-retardant qualities are important in keeping material from disintegrating but do not affect degree of severity of the injury.

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- 7b. Berkley, K.M.; Davis, T.P.; Pearce, H.E. The effect of spectral distribution on the production of cutaneous burns. Surg Gynec Obstet 114:163-6, 1962. 5 refs.

Radiation research. Study in experimental carbon arc burns in pigs with modification of spectral distribution by filters (University of Rochester, Atomic Energy Project).

- -

8. Berkow, S.G. An outline for emergency treatment of catastrophic burns. J Int Coll Surg 24:355-9, 1955.

Outline of the Middlesex County, Plan for emergency care of major and minor burns by lay personnel, if necessary. Includes "5 and 10 method" of sorting.

- -

9. Blocker, T. G., Jr., Blocker, V.; Graham, Col. J. E. and Jacobson, Hebert. Follow-Up Medical Survey of the Texas City Disaster. Amer J Surg 97:604-623, 1959.

Statistics with relation to 9-year resurvey of approximately 800 Texas City Disaster victims.

10. Blocker, V.; Blocker, T. C., Jr. The Texas City Disaster, A Survey of 3,000 Casualties. Amer J Surg 78:756-71, 1949. 1 ref.

Summary of data obtained from victims of the Texas City Disaster. Basic reference article.

11. Bowers, W. F. Priority of treatment in multiple injuries and summation of surgery of acute trauma. Arch Surg 75:743-45, 1957.

Summary of principles of triage and therapy.

12. Bradforé, V. A. Burns in Atomic disaster. Outline of current plan for emergency treatment. J Oklahoma State Med Assn 54:272-75, 1961. 10 refs.

Emergency measures for treatment of mass casualties. Outline with major emphasis on prompt sorting and classification as to area and depth of burn. Priority for treatment and general and emergency treatments are discussed.

13. Braucher, G.; Cronkite, E.P.; Conrad, R.A.; Smith, W.W. Gastric Lesions in Experimental Animals Following Single Exposures to Ionizing Radiations. *Amer J Pathol* Vol. 34 (41):105-120, 1958. 19 refs.

Radiation Burn Research: One of a series of studies in experimental irradiation.

--

14. Brooks, J.W.; Evans, E.I.; Ham, W.T., Jr.; Reid, J.D. The influence of external body radiation on mortality from thermal burns. *Ann Surg* 136:533-43, 1952. 12 refs.

Mass Burn Casualties and Radiation Research. Report of experimental studies in dogs subjected to 20% deep second degree burns combined with 106r external body radiation. Increase in mortality from 12% for burns alone to 75%. Bacteriological studies indicate early streptococcus invasion in combined group from radiation depression of immune responses (mortality reduced by penicillin therapy).

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15. Brooks, J.W.; Haynes, B.W., Jr.; Ham, W.T., Jr.; Schmidt, F.; Williams, R. A comparison of local and systemic effects following contact and flash burns. *Ann Surg* 144:768-77, 1956. 8 refs.

Basic Research in assessment, prevention and treatment of radiation effects.

--

16. Brown, J. B.; Fryer, M. P. Report of surgical repair in the first group of atomic radiation injuries. Surg Gyn Obst. 103:1, 1956.

A summary after 8 years on the surgical repair of the hands of the first known patients (4 men) with atomic radiation injuries sustained at ~~Eniwetok~~ Atoll showing that all patients were back at full-time jobs with no amputations. It is noted that these were not thermal injuries, but "pure atomic radiation" injuries.

17. Brown, K. L.; Glover, D. M. Initial treatment of burns in mass casualties. JAMA 165:643-6, 1957.

General article on early mass casualty therapy.

18. Butterfield, W. J. H.; Seager, E. R. D.; Dixey, J. R. B.; Treadwell, E. E. E. Flash Burns from Atomic Weapons. I. Observations on flashburning of human subjects in the laboratory using infrared and predominantly white light sources. Surg Gynec and Obstet 103:655-665, 1956. 23 refs.

Radiation Research: Review of studies since 1948 including apparatus techniques, thresholds for burning injury in terms of calories/sq. m and clinical aspects of burns of first, second and third degrees. Results are believed to represent uninfected atomic weapon lesions.

19. Butterfield, W. J. H. Flash burns from atomic weapons. II. Treatment of shallow blister flash burns by trials of promethazine, adrenaline, cortisone, and adrenocorticotrophic hormone. Surg Gynec and Obstet 104:53-9, 1957. 15 refs.

Radiation Research: Report of ineffectiveness of therapy with above named agents to prevent blister formation in flash burns.

20. Callahan, J. J., Segraves, J. E. Treatment of fire victims: Lady of the Angel School disaster. Amer J Surg 99:814-6, 1960.

Brief report of experiences in treatment of 74 patients in Chicago School fire, including use of convalescent serum in 6 cases.

31. Gasberg, M. A. Civil Defense: emergency treatment of burns in mass casualties. California Med 83:289-94, 1955. 9 refs.

General article on early therapy with report of hypothetical case.

22. Clarkson, P. Clinical material concerning burns relevant to nuclear warfare. J Roy Army Med Corps 101:273-91, 1955. 3 refs.

Fairly comprehensive article on casualty planning with discussion of logistics in relation to supplies.

23. Conrad, R. A., Huggins, C. E.; Cannon, B., Lowrey, A., Richards, J. B. Medical survey of Marshallese two years after exposure to fall-out radiation. JAMA 164:1192-97, 1957. 3 refs.

Report on delayed radiation effects. Follow-up study.

24. Cronkite, E. P.; Bond, V. P. Diagnosis of radiation injury and analysis of the human lethal dose of radiation. U.S. Armed Forces Med J 11:249-260, 1960. 26 refs.

Mitotic index of bone marrow is suggested as a rapid biologic index of radiation exposure. However, in the event of a major disaster when complete studies would be impossible, a leukocyte count would probably be the most useful test. Data also are presented on the 50% lethal dose of radiation for human beings.

25. Dreyer, J. W. Medical treatment of survivors of the Iroquois fire. Illinois Med J 113:147-8, 1958.

A review of experiences with patients following the Iroquois Theater fire in Chicago in 1903, in which 602 patients were killed and 15 hospitalized. Early mass casualty report of historical interest.

--

26. Drummond, J. A.; Kaufmann, J.; Randall, R. G.; Kapur, K. K.; Baxter, H. Some observations on hematological responses in swine to X-radiation and thermal injury. Plast Reconstr Surg 13:431-9, 1954. 24 refs.

Experimental Burns -- Radiation Studies.

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27. Emergency War Surgery, NATO Handbook, edited by Brigadier General Sam F. Seeley and Colonel Joseph Shaeffer, U.S. Government Printing Office, Washington, D. C., 1958.

Official Armed Forces Manual covering types of wounds and injuries, response of the body to injury, wound management, regional injuries.

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28. Enyart, J. L.; Miller, D. W. Treatment of burns resulting from disaster. JAMA 158:95-100, 1955,

Experiences with 74 casualties in the "Bennington" fire. Advantages of exposure listed with contraindications: circumferential lesions, small demarcated burns for early excision, other patients who require transportation.

- -

29. Evans, E. L.; Brooks, J. W.; Schmidt, F. H.; Ham, W. T., Jr. Flash burn studies on human volunteers. Surgery 37:280-97, 1955. 7 refs.

Important early study of experimental flashburns in human volunteers with analysis of physical factors involved.

- -

30. Fryer, M. P.; Brown, J. B. Repair of atomic, cathode-ray, cyclotron and x-ray burns of the hand. Long-term follow-up examinations and microscopic studies. Amer J Surg 103:688-691, 1962. 4 refs.

Follow-up on treatment of patients with radiation burns (from atomic, cyclotron, cathode ray, x-ray sources) of the hand. Results indicate conservative treatment (avoidance of early amputation) was effective. Hand functions have been restored and fingers saved by anticipating progressive breakdown and by early resection and skin grafting.

- -

31. Gilbert, J. E. Human behavior under conditions of disaster. Med Serv J Canada 14:318, 1958.

Behavior patterns of people under stress during World War II bombing attacks, the atomic attacks in Japan, and in Civil disasters are discussed. Advance training and preparation are vital as preventive measures.

- -

- 31a. Hardy, J. D., Stoll, A. M.; Greene, L. C. Vulnerability of the human skin to flash burns following damage by ultraviolet radiation, in Research in Burns, edited by C. P. Artz, AIBS Pub No 9, Washington, D. C., 1962.

Experimental burns with specific reference to spontaneous and experimentally induced pain.

- -

32. Haynes, B. W., Jr. Treatment of mass burns. Southern Med J 45:545-51, 1952. 16 refs.

Outline of an evacuation system and temporary hospitalization facilities of mass casualties following an atomic disaster.

- -

33. Hollingsworth, J. W. Delayed radiation effects in survivors of the atomic bombings. New Engl J Med 263:481-87, 1960. 33 refs.

A summary of the findings of the atomic bomb casualty commission, 1947-1959.

- -

34. Hronc, J. T. H.; Neuberger, J. K. W. The management of burns in the front line and during mass catastrophes. Ned Milit Geneesk T. 5:46-59, 61-80, 1952.

Not reviewed. Article available in the National Library of Medicine.

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35. Hunt, R. S. The treatment of mass burn casualties. Proc Roy Soc Med 50:974-6, 1957.

Reduction of the number of patients and an increase in "medical manpower" are advocated as essential steps in any effective program of mass disaster care. These may be accomplished by (1) evacuating any likely target area of all but necessary personnel; (2) educating the public in self-help, and (3) careful sorting of injuries. Suggests a "self-help canteen" for minor burn patients, who could go through a "cafeteria" line for drugs, dressings, etc.

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36. Jackson, R. Beta Radiation Burn of the Skin. Med Serv J Can 16:501-503, 1960. 3 refs.

Short case report of accidental injury from P32.

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37. Kelley, Douglas Mc. Civil Defense. Dealing with Hysteria in Catastrophe. Calif Med 83:295-299, 1955. 18 refs.

Discussion of various developmental stages of fear and suggestions for prevention and treatment of panic states.

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38. Kendrick, D. B. The role of blood in disaster. Milit Med 123:202-7, 1958.

Discussion of role of blood in disaster and suggestions for storing of synthetic expanders and homologous serum for use to supplement blood.

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39. Kroulik, W. J. Norethandrolone (nilevar) in the treatment of severely burned victims of the Chicago school fire. J Int Coll Surg 32:359-68, 1959. 9 refs.

Discussion of therapy with particular reference to a new anabolic steroid preparation.

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- 39a. Lawson, D. I. The Propagation of Flame over Textiles. Brit J Plastic Surg 9:186-194, 1956. 4 refs.

Measurement of vertical flame speed of various materials. Caution against open fires and loosely fitting garments rather than type of textiles per se.

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40. Levenson, S. M.; Einheber, A.; Crowley, L. V. Some effects of whole body x-irradiation and thermal injury, in *Research in Burns*, edited by C. P. Artz, AIBS Pub No 9, Washington, D. C., 1962.

Experiments with rats, mice, guinea pigs, and dogs on the effects of whole body x-irradiation on the susceptibility of the animals to the shock of thermal burns.

41. McDowell, A. J. Mass treatment of burns in atomic warfare. *Plast Reconstr Surg* 9:223-34, 1952.

Discussion of the problem of mass treatment of burns in atomic warfare in terms of types and number of expected injuries, with local wound care suggested as the primary "bottleneck" in any mass treatment program.

42. Mason, M. L. The treatment of burns in mass casualties. *Industr Med Surg* 25:403-7, 1956. 5 refs.

Discussion of general burn treatment under mass disaster conditions; emphasizes that both the correction of physiological disturbances which occur with large burns and the local treatment of the burn surface must proceed simultaneously not only to save lives but also to conserve manpower at a critical period.

43. Medical Field Service School, Brooke Army Medical Center---
Instructor's Guide and Training Program for Army Medical
Service Personnel in Emergency Medical Care, 1963.

Outline of program for training of military
personnel in emergency principles and
techniques and for mass casualty sorting
and treatment procedures.

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44. Medina, D. Des. First-aid in combat. 1. Effects of blast.
2. Burns. Arq Brasil Med Nav 18:5589-609, 1957. 36 refs.

Not reviewed. Available in the National
Library of Medicine.

- -

45. Mixter, G., Jr. Thermal effects of atomic weapons: the major
potential of nuclear warfare. Boston Med Quart. 11:1-5, 1960.
12 refs.

Discussion of necessity for setting up priority
standards for triage and treatment of patients
on the basis of radiation-plus-burn, or, for
practical purposes, distance-plus-burn-plus-
complicating injuries. These considerations
have been influenced by the threat of all-out
damage, taking into account winds and weather,
also by developments in the size, nature and
potentialities of the nuclear weapons.

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46. Moore, H. E. Some emotional concomitants of disaster. *Mental Hygiene* 42:45, 1958.

A research report on the emotional impact of two natural disasters occurring one year apart in San Angelo, Texas. Evidence indicates that effects were stronger and longer lasting than the economic problems involved, although loss was referred to by the victims mainly in terms of economics.

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47. Morton, J. H.; Kingsley, H. O.; Pearce, H. E. Studies on flash burns; threshold burns. *Surg Gynec Obstet* 94:317-22, 1952. 11 refs.

Early experimental studies on flash burns with establishment of physical criteria.

--

48. Pillsbury, R. D.; Artz, C. P. Necessary compromises in therapy of burns sustained in nuclear warfare. *JAMA* 162:956-8, 1956.

Major compromises in normal burn therapy mandatory in case of nuclear disaster--including the exclusion of patients with less than 15% or more than 40% body surface burns from high priority treatment.

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49. Pillsbury, R. D.; MacMillan, B. G.; Artz, C. P. Experiences in air evacuation of severely burned patients. *Milit Med* 120:202-4, 1957.

Short article on experiences at the Surgical Research Unit at Brooke Army Medical Center in air evacuation of patients. Includes requirements for personnel and equipment.

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50. Regan, J. F. Civil Defense. Proper handling of mass casualties during a major disaster. *California Med* 83:282-8, 1955. 2 refs.

General article with regard to sorting procedures for injuries.

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- 50 a. Reid, J. D.; Brooks, J. W.; Ham, W. T.; Evans, E. L. The influence of X-radiation on mortality following thermal flash burns. The site of tissue injury as a factor determining the type of invading bacteria. *Ann Surg* 142:644-50, 1955. 5 refs.

Study of combined effects of burns and irradiation in dogs with particular reference to depression of host resistance to blood stream infection.

- -

51. Rhoads, J. E. Mass treatment of burns. *Pennsylvania Med J* 56:191-4, 1953. 11 refs.

General article emphasizing 1) oral fluid therapy when possible, with blood and plasma or plasma substitutes for those who would receive the most benefit from it; 2) both closed and open local therapy, 3) "an early and vigorous" feeding program; 4) burn centers established for debridement and skin grafting.

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52. Schenk, W.G., Jr.; Stephens, J.G.; Burke, J.; Hale, H.W., Jr.; Eagle, J.F.; Stewart, J.D. Treatment of mass civilian burn casualties; care of Cleveland Hill school fire victims. *AMA Arch Surg* 71:196-201, 1955. 8 refs.

A report on 11 severely burned patients (ages 10-12) from the Cleveland Hill School Fire and, based on this experience, some suggestions for the care of burn casualties in mass disasters.

53. Schenk, W.G., Jr. Initial treatment of burn casualties. *New York J Med* 56:1612-3, 1956. 5 refs.

Discussion of general burn disaster rules, including necessity for rapid screening and sorting of casualties; initial care of the burn wound ("protect it and forget it"); anti-shock measures and fluid therapy.

54. Vogel, E.H. Jr. Management of burnas resulting from nuclear disaster. *JAMA* 171:205-8, 1959. 1 ref.

Emphasis on the necessity for self-care or "buddy-care" as much as possible in the treatment of burn patients following a nuclear disaster. Ideal treatment and necessary compromises in general care are pointed out and disaster kit for civilian self-care is outlined.

55. Waris, W. Burns associated with nuclear mass destruction. Sotilaslaak Aikak 35:130-8, 1960.

Not reviewed. Available in National Library of Medicine.

- -

56. Woolhouse, F.M. The definitive treatments of burns in mass casualties. Canadian Med Assoc J 76:376-80, 1957.

Discussion primarily of local care of major burn injuries after the patient has reached a hospital unit, including dressings, debridement and grafting procedures.

- -

57. Zuidema, G.D.; Clarke, N.P.; Prine, J. R., Salzman, E.W. An experimental study relating fabric types with severity of burns. Surg Gynec and Obstet, 103:581-89, 1956. 12 refs.

Study of a number of materials commonly employed for clothing, with emphasis on danger of loose fitting garments and untreated cotton in non-flash burns and protection in flash burns dependent upon weight, thickness, color and treatment of materials with flame retardant chemicals.

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58. Zuidema, G. D.; Clarke, N. P. The Role of Clothing in Prevention of Thermal Injury. *Plast & Reconstr Surg* 20:449-54, 1957. 4 refs.

Animal experimentation emphasizing major qualities of fabrics commonly employed for clothing with analysis of ability to protect or failure to protect against thermal injury. Gross and microscopic grading of severity and analysis of healing time.

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V

EMERGENCY CARE, EARLY THERAPY
AND REPLACEMENT FLUIDS

V

EMERGENCY CARE, EARLY THERAPY
AND REPLACEMENT FLUIDS

1. Ahnefeld, F. W. Suppression of intoxication of burns with periston-N. Muenchen Med Wschr 97:235-6, 1955. 11 refs.

Use of periston-N as a plasma expander.

- -

2. Allen, H. S. Emergency care of the burned patient. Med Clin N Amer 38(1):95-100, 1954.

General teaching article by late well-known authority, advocate of closed methods.

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3. Allgöwer, M. Normal blood in the therapy of burn shock. Arch Klin Chir 282:124-31, 1955. 36 refs.

Review of literature and case report by Swiss burn authority. Material included in textbook.

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4. Allgöwer, M. First-aid in thermal burns. Z Unfallmed Berufskr 54:85-98, 1961.

Short article by well-known Swiss burn authority.

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5. Allgöwer, M. Blood, plasma or electrolytes in the treatment of burns. J Int Coll Surg 38:421-8, 1962.

Experiences with use of mixture of blood (400 cc), plasma (250 cc) and saline (350 cc) with rates of flow and total amounts dependent upon severity of burn and response to therapy.

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6. Amspacher, W.H. The early management of burns. Surg Clin N Amer 36:1385-94, 1956. 7 refs.

General teaching article according to 1956 Army Surgical Research Unit techniques.

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7. Ardiman-Schapiro, Juana. Treatment of burns with ganglionic blocking agents. J Amer Med Women's Assn 13:494-495, 1958.

Use of ataractic drugs as an adjunct to early therapy by Chilean woman surgeon.

- -

8. Artz, C.P.; Reiss, E. Calculator for estimating early fluid requirements in burns. JAMA 155:1156-8, 1954.

Calculator developed at the Surgical Research Unit
at Brooke Army Medical Center.

- -

9. Artz, C.P.; Green, B.E. Essentials of burn therapy. Surg Clin N Amer 38:1461-74, 1958. 9 refs.

Plan of approach for immediate hospital care.
General teaching article. Material included in
textbook of Artz and Reiss.

- -

10. Artz, C.P.; Hoopes, J.E. Current knowledge of fluid balance in burns. Amer J Surg 103:316-20, 1962. 22 refs.

Teaching article by burn authority notable chiefly
for emphasis on individual evaluation and use of
lactated Ringer's solution.

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11. Baden, H.; Backer, O.; Spechler, M. Infusion treatment of burns. Ugeskr Laeg 122:821-4, 1960. 2 refs.

Clinical studies (Copenhagen) in 22 patients, employing
fluids as advocated by Wallace.

- -

12. Berchtold, R. On the early treatment of severe burn. Z Unfallmed Berufskr 54:99-100, 1961.

Not reviewed. Available in the National Library of Medicine.

- -

13. Bettman, A.S. Contraindications for plasma as the first fluid in severe shock after burns. Amer J Surg 91:937-9, 1956. 11 refs.

Argument on basis of author's clinical observations on timing of fluid therapy. Strong proponent of tannic-acid silver nitrate local regimen.

- -

14. Burniller, H. Burns treated with partial exchange transfusion. Zbl Chir 86 2597-602, 1961.

Not reviewed. Available in the National Library of Medicine.

- -

15. Casberg, M.A.; Blocker, T.G., Jr.; Levin, W.C.; Dunton, E.F. Pasteurized human plasma. Amer J Surg 97:597-603, 1959. 9 refs.

Clinical experiment demonstrating safety of pasteurized pooled plasma from standpoint of hepatitis incidence.

- -

16. Chodos, J. L. Emergency treatment of burns. A new drug combination. *Dia Med* 34:1805, 1962.

Not reviewed. Available in the National Library of Medicine.

- -

17. Collentine, G. E., Jr. How to calculate fluids for burned patients. *Amer J Nurs* 62 (#3):77-9, 1962. 3 refs.

Teaching article directed at nursing personnel.

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18. Cordice, J. W. V., Jr.; Seuss, J. E.; Scudder, J. Polyvinylpyrrolidone in severe burn shock. *Surg Gynec Obstet* 97:39-44, 1953. 6 refs.

Early experience with P. V. P. in eight patients.

- -

19. Cristol, J.; Berling, C. Emergency resuscitation of severely burned patients. *Press Med* 69:2313-16, 1961.

Presentation of a burn therapeutic regimen which emphasizes methods of Weber, Vilair, Deleuze, Lorthoir (use of Plasmagel, neuroplegics, therapeutic agents to control hyperammonemia, etc.).

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20. Deleuze, R.; Gate, A. Importance of human plasma albumin solutions in the treatment of burns. *Agressologie* 2:184-94, 1961.

Not reviewed. Available in the National Library of Medicine.

- -

21. Eagle, J. F. Parenteral fluid therapy of burns during the first forty-eight hours. *New York J Med* 56:1613-8, 1956. 3 refs.

Experiences in several hundred children with use of single parenteral solution consisting of 2/3 saline, 2% protein, 5% glucose given during the first 48 hours to replace all fluid needs.

- -

22. Eagle, J. F., Jr., Schenck, W. G., Jr.; Shim, W. Parenteral fluid therapy of burns; use of a single solution during first 48 hours. *JAMA* 174:1589-92, 1960. 7 refs.

Discussion of Eagle's solution as replacement fluid. Formula of 0.67% NaCl, 2% protein and 5% glucose supplied by one unit of plasma, one unit 5% Dextrose in H₂O and one unit 5% Dextrose in Saline or 2 gm serum albumin per 100 cc of combined solution of two units of 5% Dextrose Saline and one unit of Dextrose H₂O. Rate of administration 20 cc per percent of involvement per hour.

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23. Engelhardt, A.; Fekl, W. Infusion therapy in burns. Aertztl Fortsch 10:1/453-4, 1956.

Not reviewed. Available in the National Library of Medicine.

- -

24. Evans, E.I.; Purnell, O.J.; Robinett, P.W.; Batchelor, A.; Martin, M. Fluid and electrolyte requirements in severe burns. Ann Surg 135:804-17, 1952. 13 refs.

Presentation of "Evans" formula as a guide to fluid therapy on basis of percentage of involvement up to 50%.

- -

25. Evans, E.I. The early management of the severely burned patient. Surg Gynec Obstet 94:273-82, 1952. 20 refs.

Outline of burn regimen at the Medical College of Virginia with report of standardized dry burn dressing and notes on closed versus open methods and ACTH therapy.

- -

26. Evans, E.L.; Martin, M.M. The successful use of dextran in the treatment and prevention of shock in the burned patient. Surg Forum 5:743-4, 1954. 3 refs.

Report that dextran alone is sufficient except in anemic patients or those with extensive 2nd or 3rd degree burns.

- -

27. Fogelman, M.I.; Wilson, B.J. Blood, extracellular fluid and total body water volume relationships in the early stages of severe burns. Surg Forum 5:762-70, 1954. 4 refs.

Report of studies in nine normal subject and ten burn patients with extracellular S35 fluid volume studies.

- -

28. Fox, C.L., Jr.; Winfield, J.M.; Slobody, L.F.; Swandler, C.M.; Lattimer, J.K. Electrolyte solution approximates plasma concentrations. JAMA 149:827-33, 1952.

Discussion of saline therapy in burns as "unphysiological saline" because of high chloride content and description of a more physiological "balanced" electrolyte replacement solutions.

- -

29. Fox, C. L., Jr.; Lasker, S. E.; Winfield, J. M.; Mersheimer, W. L.; Silverstein, M. E. Observations on the effects of blood, plasma and sodium salt solutions in the treatment of extensive burns. *Amer J Surg* 89:730-9, 1955. 22 refs.

Experimental studies in monkeys emphasizing necessity for fluids and electrolytes to replace quantitative and qualitative losses in the extracellular fluids as well in the vascular compartment.

- -

30. Fox, C. L., Jr.; Lasker, S. E.; Winfield, J. M. Rationale of early fluid and sodium therapy of extensive burns in *Current Surgical Management*, edited by Mulholland, J. G.; Ellison, E. H.; Frieson, S. R.; W. B. Saunders Co., Philadelphia/London, 1957. 37 refs.

Objectives of early therapy: adequate circulating blood volume; replace sodium and water losses in edema fluid, control the anemia which develops. Experimental and clinical experience demonstrates that with various combinations of fluids the period of survival of potentially fatally injured animals and patients (50% critical level) may be prolonged but ultimate recovery appears not to be related to early fluid therapy.

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31. From, A. A.; Kosmachevskaia, G. A.; Iurkov, A. S. On the mechanism of the detoxicating effect of low molecular polyvinylpyrrolidone, *Probl Gemat* 7:44-9, 1962.

Not reviewed. Available in the National Library of Medicine.

- -

32. Gelin, L. E. Macrodex and oxygen in the primary treatment of extensive burns. *Acta Chir Scand* 103:351-362, 1952. 37 refs.

Report of use of Macrodex for maintaining osmotic pressure in the circulating blood and relieving aggregation of blood cells in 128 patients (only 8 over 30%), combined with use of closed tent employing 100% oxygen. Macrodex administered as follows:
5-10% 1-2 liters/12 hours; 10-20% 2-4 liters/24 hours;
20-30% 3-7 liters/36 hours, 30-40% 5-10 liters/48 hours;
40-50% 8-12 liters/60 hours; etc.

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33. Gore, D. Fluid management in burns. *W Indian Med J* 8:50-6, 1959. 8 refs.

Outline of fluid therapy according to Evans formula, employing urinary output and clinical response as a guide. Other supportive treatment included.

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34. Hartenbach, W. Hormone, protein and electrolyte loss in severe burns. *Arch Klin Chir* 297:490-503, 1961. 13 refs.

Detailed treatment for the first 48 hours.

- -

35. Haynes, B. W., Jr.; Major, M. C.; Martin, M. M.; Purnell, O. J. Fluid, colloid, and electrolyte requirements in severe burns. 1. An analysis of colloid therapy in 158 cases using the Evans formula. *Ann Surg* 142:674-9, 1955. 6 refs.

Comments on Evans formula (insufficient colloid for children, overestimation for adults), dextran with blood recommended rather than plasma.

- -

36. Haynes, B. W., Jr. Dextran therapy in severe burns. *Amer J Surg* 99:684-689, 1960. 10 refs.

Early treatment. Review of experiences with dextran at the Medical College of Virginia Burn Service. See 1962 reference.

- -

37. Haynes, B. W., Jr. Dextran therapy in severe burns in *Research in Burns*, edited by C. P. Artz, AIBS, Pub. No 9, Washington, D. C., 1962.

Summary of 11-years experience with dextran at the Medical College of Virginia. Discussion of action as a plasma volume expander and an osmotic diuretic. No finding of prolonged bleeding or anaphylactic reactions, although these have been reported in non-burn patients. Experience with dextran as replacement therapy with blood in major burns, without blood in lesions up to 25%.

- -

38. Hofmeister, L. Infusiontherapie in burns. *Anaesthesist Berl* 8:38-41, 1959. 5 refs.

Not reviewed. Available in the National Library of Medicine.

- -

39. Holubec, K. The Treatment of Shock Caused by Burns, *Acta Chir Plast Vol.* 3(2):111-119, 1961. 4 refs.

Discussion of criteria for plasma dosage in burn shock. Use of Evans Blue intravenously for staining of necrotic tissue to determine depth.

- -

40. Howard, J.M., Ebert, R.V.; Bloom, W.L., Sloan, M.H. The present status of dextran as a plasma expander. *Amer J Surg* 97:593-6, 1959. 3 refs.

Discussion of value of dextran as an emergency plasma volume expander for civilian and mass casualty therapy. Comments on the small present demand for production.

- -

41. Johnston, E. V.; Lundy, J. S. Use of dextran (macrodex) in burns. I. Review of physiology of dextran. Amer J Surg 85:713-9, 1953. 31 refs.

Analysis (from the Mayo Clinic) of properties and action of dextran as a plasma volume expander. Report of histologic studies in parenchymatous organs.

- -

42. Johnston, E. V.; Lundy, J. S.; Bennett, W. A.; Jones, J. M. Use of dextran (macrodex) in burns. II. Clinical evaluation in eight cases. Amer J Surg 85:720-8, 1953. 14 refs.

Continuation of previous study: Clinical experience with dextran in burned patients. Recommended primarily for use in early shock phase and as an adjunct to whole blood.

- -

43. Ludinghaus, H. Treatment of shock in severe burns. Ther Gegenw 98:583, 1959.

Not reviewed. Available in the National Library of Medicine.

- -

44. Maffer, G.; Bonarelli, F. R. Transfusion therapy in a burn center: problems of organization and technique. *G Med Milit* 110:496-9, 1960. 5 refs.

Not reviewed. Available in the National Library of Medicine.

- -

45. Markley, K.; Bocanegra, M.; Bazan, A.; Temple, R.; Chiappori, M.; Morales, G.; Carrion, A. Clinical evaluation of saline solution therapy in burn shock. *JAMA* 161:1465-73, 1956. 12 refs.

Project at Lima, Peru. Comparison between two similar groups of burns, one treated with large volumes of isotonic saline, largely oral (not hypotonic saline), and one with colloids, dextrose, water and little sodium, by vein. Conclusion that groups were comparable in mortality and that saline group did better clinically than those who received no salt. Conclusion--colloid therapy inferior to saline.

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46. Markley, K.; Bocanegra, M.; Bazan, A.; Temple, R.; Chiappori, M.; Morales, G.; Carrion, A. Clinical evaluation of saline solution therapy in burn shock. II. Comparison of plasma therapy with saline solution therapy. *JAMA* 170:1633-40, 1959. 11 refs.

Report from the Lima Study group indicated the value of isotonic saline in treatment of adult burns but emphasizing the difficulty of employing large quantities of oral isotonic saline because of lack of palatability, vomiting and diarrhea.

- -

47. Markley, K.; Bocanegra, M.; Chiappori, M.; Morales, G.; John, D. The influence of fluid therapy upon water and in electrolyte equilibria and upon the circulation during shock period in burned patients. *Surgery* 49:161-78, 1961.

Additional data from Lima Project on 153 adults and 185 children. In adults saline therapy alone (0% mortality) had a lower mortality and morbidity than colloid (plasma) and dextrose in water without saline or only very small amounts (12% mortality). In children burns of 30% and over were almost invariably fatal. A total of 20% mortality in shock period in 110 children. When plasma was added to saline mortality dropped to 9%.

48. Markley, K.; Kefalides, N.A. Further studies in the evaluation of saline solutions in the treatment of burn shock, in *Research of Burns*, edited by C.P. Artz, AIBS, Pub No 9, Washington, D.C., 1962.

A clinical study to evaluate the effects in small groups of burn patients of (1) saline solutions given during the first 48 hours postburn on shock and late mortality and (2) the addition of saline solution (instead of glucose and water) to plasma therapy (40%-50% of that recommended by Evans) on mortality during the shock period.

49. Pierer, H. Emergency operations for fresh burns of the head and neck. *Arch Klin Chir* 290:495-507, 1959. 27 refs.

Not reviewed. Available in the National Library of Medicine.

50. Rehn, J. Burns and plasma substitutes. *Anesthesist* 8:264-8, 1959. 19 refs.

Not reviewed. Available in the National Library of Medicine.

- -

51. Reiss, E.; Stirman, J. A.; Artz, C. P.; Davis, J. H.; Amspacher, W. H. Fluid and electrolyte balance in burns. *JAMA* 152:1309-13, 1953.

Study of rate and composition of fluid losses; composition, volume and rate of flow of replacement based on data from the Surgical Research Unit, Brooke Army Medical Center. Therapy outlined.

- -

52. Sako, Y. The emergency care of burns. *Med Clin N Amer* 46:383-94, 1962.

Not available. Available in the National Library of Medicine.

- -

53. Schenk, W.G., Jr.; Stephens, J.G. Clinical experience with Eagle's solution in the treatment of severe burns. *J Lancet* 79:191-2, 1959. 2 refs.

Use of solutions consisting of 2/3 normal saline in 5% glucose containing 2% protein (as serum albumin); this is the single solution used.

54. Schilling, J.A.; Gann, H.E.; Richardson, W.R.; Dunlap, H.E. A new approach to fluid therapy of the severely burned patient; the use of urea as an electrolyte substitute. *Ann Surg* 150:756-67, 1959.

Preliminary report of four clinical cases in which 4% in 5% urea in dextrose was substituted for salt solution with colloids. Urine volume was maintained at 2-3 ml. per minute. Improved urinary output observed.

55. Schlegel, J.U.; Anderson, F.W.; Madsen, P.O.; Bethell, J.J. The altered response to sodium loading in several severely burned individuals after initial treatment with hypertonic sodium containing fluids. *Surg Gynec Obstet* 99:187-92, 1954. 3 refs.

Report of three pediatric cases in which hypertonic NaCl was given with evaluation of fluctuation in urinary pH. Conclusion that increased adrenal activity does not produce obligatory Na retention in excess of serum concentration and that pH determinations may serve as a guide to therapy. Recommendation that potassium treatment be started on 3rd to 4th day postburn.

56. Thorsen, G. The use of dextrans as infusion fluids. Surg Gynec and Obstet 109:43-52, 1959.

Comprehensive review of indications for dextran therapy.

- -

57. Vigne, J., Pessereau, G.; Monteil, R.; Duc, M.; Storck, J. Human albumin in the resuscitation of severely burned patients. Presse Med 69:1595-7, 1961.

Advantages of resuscitative therapy with human albumin in comparison with other colloids. 100 ml. corresponds to 350 ml. of plasma or synthetic plasma expanders.

- -

58. Vogel, E.H., Jr. Immediate therapy in burns. GP 20(4):120-4, 1959.

Brief summary of essentials of early care (Brooke regimen).

- -

59. Wallace, A. B. Assessment and emergency treatment of burns. *Brit Med J* 2:1136-8, 1955.

Recommendation of 1:1 colloid/electrolyte proportions in superficial burns, (2:1 3/4: 1/4 blood/colloid/electrolyte for deep burns of over 10%. Routine use of penicillin. Exposure therapy.

- -

60. Wilkinson, A. W. The early treatment of burns. *Brit J Plast Surg* 10:275-91, 1958. 24 refs.

General article advocating 6% dextran in saline instead of plasma, six cases reported in detail.

- -

61. Wilson, B. J.; Stirman, J. A. Initial treatment of burns. *JAMA* 173:509-16, 1960. 9 refs.

Comparison of mortality in a small group of severe burns treated at Parkland Hospital (Dallas) 1944-52, who received whole blood, plasma and saline with a large group of cases 1952-56 treated chiefly with saline. Patients with tracheobronchial lesions excluded, as well as elderly patients, burns of over 65% and less than 15%. Burn index employed rather than true depth. Inferences drawn with regard to influence of therapy on mortality, particularly during shock phase.

- -

62. Wilson, C. E.; Swenson, S. A., Jr. Management of the burned patient. Initial care of the patient. Nebraska Med J 42:491-6, 1957.

Appraisal of burns, review of pathological changes,
initial supportive therapy (Evan's formula).

VI

LOCAL THERAPY; TOPICAL

AGENTS: LOCAL INFECTION

LOCAL THERAPY; TOPICAL
AGENTS; LOCAL INFECTION

1. Adamczak, T.; Maciejczyk, S. Local Burn Treatment with Silicones
New Method of Ensuring Dry Milieu, *Acta Chir Plast*, 3:49-58, 1961.

Paper given by Polish surgeons at Czech International
meeting on Burns, 1960, advocating use on minor burns.

- -

2. Arden, G. P. The prevention and treatment of infection in burns by
dibrompropamide. *Brit J Plast Surg* 6:292-303, 1954. 10 refs.

Topical application of .15% M and B cream in combination
with dressing. (115 pts) For control of infection it was
found to have no advantages over penicillin. Recommended,
however, as a possible first-aid dressing because of drying
qualities.

- -

3. Artz, C. P. Practical techniques in the care of the burn wound. *Amer Surg* 24:593-9, 1958. 6 refs.

General review article by well-known burn authority.

- -

4. Artz, C.P.; Gaston, B.H. A reappraisal of the exposure method in the treatment of burns, donor sites and skin grafts. *Ann Surg* 151:939-50, 1960. 6 refs.

A general review of present status of exposure therapy, including 10 years experience since its revival as a modern technique. Important article by noted authority.

- -

5. Backus, L.H. Late Reconstructive Problems of Burn Scar Deformities, N. Y. *State J Med* 56:1622-1625, 1956.

Basic types of defects and discussion of techniques involved in burn scar reconstruction.

- -

6. Bailey, B.N. Streptomycin and hydrocortisone in the local treatment of burns. *Brit J Clin Pract* 12:633-4, 1958.

Experiences with these agents applied in preparation for grafting and on graft site.

- -

7. Baker, T. J. Open technique in the management of burns. Amer J Nurs 59(9):1262-5, 1959.

General discussion for nursing personnel of early local wound management in burns.

- -

8. Barrile, N. On the subject of emergency burns of the extremities, practical rules for their management. Dia Med 31:336-8, 1959.

Initial treatment and local care. Short article.

- -

9. Baxter, H.; Randall, R. G., Kapur, K. K. Occlusive dressing versus exposure method in treatment of thermal burns. Canad Med Assn J 69:97-102, 1953. 9 refs.

General background article in controversy between closed and open method in early 1950 s.

- -

10. Bell, J. L. The local care of burn wounds. Surg Clin N Amer Feb:195-201, 1955.

General teaching article on local care from initial stages to skin grafting.

- -

11. Bell, J. L. Treatment of acute thermal burns of the face. Amer J Surg 98:923-7, 1959. 3 refs.

General teaching article with regard to face burns.

- -

12. Benaim, F.; Satuf, A. Bandaging of the burned hand. Sem Med (B Air) 116:1032-3, 1960.

Local therapy of the burned hand in initial treatment.

- -

13. Berti-Riboli, R.; Bandini, T. A biological method for the treatment of burns. Minerva Chir 8:842-7, 1953. An aortic extract in the form of an ointment used. 11 refs.

Preliminary experimental study with topical agent.

- -

14. Beume, K. Experiences in the treatment of large-area burns and old trophic ulcers with terracorti spray. Ther Gegenw 100:535-6, 1961.

Experiences in use of topical agent.

- -

15. Blocker, T.G., Jr.; Blocker, V.; Lewis, S.R.; Snyder, C.C. An approach to the problem of burn sepsis with the use of open-air therapy. Ann Surg 134:574-580, 1951.

Comparison of cases employing closed and open methods with particular reference to morbid factors. Data from the University of Texas Medical Branch.

- -

16. Blocker, T.G., Jr. Exposure therapy of burns, in Current Surgical Management, edited by Mulholland, J.G.; Ellison, E.H.; Frieson, S.R. W. B. Saunders Co., Philadelphia/London, 1957. 4 refs.

Discussion of role of local therapy in the burn regimen history and rationale of the exposure method, indications and contraindications.

- -

17. Blocker, T.G., Jr., Eade, G.G.; Lewis, S.R.; Jacobson, H.S.; Grant, D.A.; Bennett, J.E. Evaluation of a semi-open method in the management of severe burns after the acute phase. Texas J Med 56:402-8, 1960.

Local and systemic therapy with reference to pre-grafting and grafting phases.

- -

18. Blocker, T.G., Jr.; Lewis, S.R.; Grant, D.A.; Blocker, V.; Bennett, J.E. Experiences in the management of the burn wound. Plast Reconstr Surg 26:579-589, 1960. 19 refs

Comprehensive article describing techniques of burn care as employed during recent years on the Burns Service at the University of Texas Medical Branch, with emphasis upon mechanical cleanliness and water micro-debridement and handling of grafting phase.

- -

19. Bowen, O.R.; Stine, M.E.; Walters, C.E. Successful management of burn case involving 45% of body surface. J Indiana Med Assn 48: 972-5, 1955.

Case report involving use of topical bacitracin spray.

- -

20. Brown, P.M. ; Masson, J. K. , Elkins, E. C. Use of the Hubbard tank as an adjunct in the management of severe burns. Minnesota Med 42:1080-3, 1959. 7 refs

Indications for hydrotherapy.

- -

21. Choy, D.S.J. Rates of wound healing when standard and experimental burn dressings were used. U.S. Armed Forces Med J 4:559-61, 1953.

Study relating dressings with wound healing.

- -

22. Choy, D. S. J. Clinical trials of a new plastic dressing for burns and surgical wounds. AMA Arch Surg 68:33-43, 1954. 2 refs

Preliminary studies with polyvinyl plastic spray in acute burn wounds following experimental use in pigs.

- -

23. Clarkson, P. , Pigott, B. The use of pyribenzamine and pyribenzamine-bradosal creams in the local primary treatment of burns. Guy's Hospital Rep 103:49-53, 1954. 2 refs .

Limited clinical study.

- -

24. Condon, K. C. A method of diagnosis and management of the burned hand. *Brit J Plast Surg* 12:129, 1959.

Review of the literature with reference to therapy
of the burned hand and general methods of management.

- -

25. Contzen, H. Local treatment of superficial burns with andantol jelly. *Muenchen Med Wschr* 101:620-2, 1959. 9 refs.

Review of 134 cases treated with an antihistamine jelly
(Andantol-Gellee).

- -

26. Crassweller, P. O.; Farmer, A. W.; Franks, W. R.; McComb, C. R. Studies in the pressure of closed burn dressings. *Plast Reconstr Surg* 10:408-30, 1952. 9 refs.

Experimental studies with conventional "pressure"
dressings, alone and aided by incorporation of
inflatable bladders. Initial pressure of 20 to 40 cm.
of water falls rapidly and sustained pressure results
in no clinical advantage. Reports of experiences with
aluminum foil in dressing.

- -

27. Dingman, R. O.; Feller, I. Semi-open method in the management of the burn wound. *Plast Reconstr Surg* 26:535-9, 1960. 3 refs .

Simplified techniques with emphasis on mechanical cleanliness and use of single layer dressings.

- -

28. Doucet, P. "Adhesive hydrocortisone plaster" in the treatment of burns and loss of cutaneous substance *Marseille Chir* 12:162-6, 1960.

Not reviewed. Available in National Library of Medicine.

- -

29. Farringer, J. L., Jr. Open method of burn treatment and use of skeletal traction. *Amer Surg* 19:1104-10, 1953. 426 patients. 4 refs .

Employment of skeletal traction devices to aid in exposure of circumferential burns.

- -

30. Feller, I., Koepke, P.; Drew, D. The management of extensive full-thickness thermal wounds. *Surg Clin N Amer* 41:1177-89, 1961.

Local wound therapy from the standpoint of debridement, grafting, and prevention and treatment of contractures.

- -

31. Ferguson, A.D.; Scott, R.B. Erythromycin-polymyxin ointment in the treatment of infected burns. *J Nat Med Assn* 47:18-20, 1955. 3 refs.

Use of topical ointment in 12 clinical patients.

- -

32. Fleisher, W.L. Advances in the local treatment of ambulatory industrial burns. *Industr Med Surg* 21:93-8, 1952. 3 refs.

Advantages of uses of Zinax gel (partially hydrolyzed casein and zinc acetate) gauze in a large series (581) of localized industrial burns in comparison with 1945 treated with vaseline gauze.

- -

33. Fleming, J. P. Cranio-facial burns. Brit J Plast Surg 14:132-7, 1961.
1 ref.

Six case reports of very extensive deep burns of the face and scalp with osseous involvement. Operative management and results.

- -

34. Forage, A. V. The effects of removing the epidermis from burned skin. Lancet 2:690-3, 1962.

Report of a case with identical burns of both legs in which epidermis was removed from one side. Water loss was measured and clinical data recorded. Results indicated that conservation of epidermis favored rapid local healing and better end result.

- -

35. Foreman, J., Sokolic, J. H., Howard, J. M. An evaluation of local therapy for second degree burns. A preliminary report. J. Trauma 1:447-56, 1961. 6 refs

Evaluation with respect to (1) regional lymph adenopathy, (2) temperature, (3) wound pain, (4) edema, (5) bacterial contamination and (6) rate of healing of 10 methods of local burn therapy in 100 volunteer patients, each serving as his own control.

- -

36. Galambos, J. and Takats, A. Treatment of 2nd and 3rd degree burns of the hand. *Acta Chir Plast (Praha)* 4(4):305-12, 1962.

Review of management of hand burns (Budapest) with particular reference to electrical burns and emphasis upon necessity of employing both orthopedic and plastic techniques in reparative procedures.

- -

37. Garnes, A. L., Corbin, E. E.; Frigot, A. Local therapy of burns with a neomycin-bacitracin spray powder. *Antibiot Med* 7:291-4, 1960. (5 refs).

Use of an antibiotic spray in 21 patients with second and third degree burns.

- -

38. Garre, E. Tetracycline-oleandomycin in the treatment of burns. *Antibiot Med* 7:285-90, 1960.

Report of favorable results with tetracycline-oleandomycin as routine prophylactic and therapeutic antibiotic in 502 patients in Rosario, Argentina.

- -

39. Gate, A.; Doleuze, R. The surgical treatment of deep burns of the back of the hand (charring excepted). *Ann Chir Plast* 6(2):11-22, 1961.

Not reviewed. Available in the National Library
Of Medicine.

- -

40. Gelb, J. The control of infection in burn therapy. *Ann N Y Acad Sci* 82:173-81, 1959.

Clinical experience with Triburon ointment in 10
patients.

- -

41. Glass, W. Treatment of local burns with supracid gel. *Zbl Chir* 85:2279-84, 1960.

Not reviewed. Available in the National Library
of Medicine.

- -

42. Glenk, G. Local treatment of 1st and 2nd degree burns with badional gel
Zbl Chir 78:385-9, 1953.

Not reviewed. Available in National Library of
Medicine.

--

43. Gonzalez-Ulloa, M. Treatment of burns: evaluation of the advantages
and disadvantages of open and closed treatment. Medicina Mex 34:569-
78, 1954.

Not reviewed. Available in National Library of
Medicine.

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44. Grant, J. C.; Findlay, J. C. Local treatment of burns and scalds
using chlorhexidine. Lancet 272 (i):862-3, 1957. 2 refs.

Report of beneficial results in use of gauze-
soaked chlorhexidine as topical agent in 108 cases.
Comparison with 92 previous cases.

--

45. Green, Byron E., Jr. Surgical irrigation apparatus, Surgery 48:952-956, 1960.

Description of converted tub for use in association with water spray in mechanical cleansing of burn patients.

- -

46. Griffith, C. A. Burns. I. Local wound treatment by exposure. Northwest Med 55:57-61, 1956. 9 refs.

History, indications and technique of exposure therapy.

- -

47. Gronley, J. K.; Yeakel, M. H.; Grant, A. E. Rehabilitation of the burned hand. Arch Phys Med 43:508-13, Oct 62.

Outline of management of hand burns at the Surgical Research Unit, Brooke Army Medical Center, with particular reference to positioning devices.

- -

48. Hale, H. W. Treatment of the burn wound. *New York J Med* 56:1618-20, 1956.

Review of open and closed methods.

- -

49. Hamelmann, H.; Kraemer, H. Local treatment of severe burns. *Muenchen Med Wschr* 103:1660-2, 1961. 11 refs.

Not reviewed. Available in National Library of Medicine.

- -

50. Hein, W. A new remedy for treatment of burns, *Med Klin* 52:2047, 1957. Vulnogeiat (powder gelatin with a silver and antibiotic preparation) used in 60 cases.

Not reviewed. Available in National Library of Medicine.

- -

51. Heymann, J. Local control of pain in burns, *Med Klin* 49:559-60, 1954. Oxy-poly-ethoxydodecane (Thesit) in an ointment used for local anesthetic. 11 refs.

Not reviewed. Available in National Library of Medicine.

- -

52. Holman, S. P.; Shaya, E. S.; Hoffmeister, F. S.; Edgerton, M. T., Jr. Studies on Burns. I. The exposure method vs occlusive dressings in the local treatment of experimental burns. *Ann Surg* 143:49-56, 1956.

Serial histological studies in experimental animals (pigs) with burns treated by dressings and by exposure. Marked absence of infection in open burns with more rapid healing (average difference 2 weeks).

- -

53. Hudson, I. D. The out-patient treatment of burns with a tulle impregnated with silver dinaphthylmethane disulphonate. *Brit J Plast Surg* 12:238-41, 1959. 2 refs.

Comparison of results with tulle gras and silver dinaphthylmethane disulphonate tulle in second degree burns.

- -

54. Hueston, J. T. The value of exposure in local burns therapy. *Aust New Zeal J Surg* 23:63-9, 1953. 5 refs.

Experiences in use of exposure in Korea and discussion of mass casualty applications.

- -

55. Hummel, R.P.; Rivera, J.A.; and Artz, C.P. Evaluation of several antibiotics used locally on granulating burn wounds. Ann Surg 146:808-822, 1957. 4 refs.

Report from Surgical Research Unit, Brooke Army Medical Center. Local antibiotics were found to have no beneficial effects in control of bacteria colonizing burn granulations.

- -

56. Jackson, J.L. Early Care of Burns, Arch Surg 75:718-719, 1957.

Recommendation of closed methods as initial therapy.

- -

57. Johnson, H.A. Dressing burns without opiates. Wisconsin Med J 60:296, 1961.

Note on use of saline-detergent bath to facilitate removal of burn dressings.

- -

58. Jorns, G. Local treatment of burns. Med Mschr 12:688-90, 1958. 11 refs.

Experiences with sterile gelatine. (Vulnogat).

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59. Kane, A. A.; Rudolph, L.; Saydjari, M. S.; Rosenhaus, H.; Fink, H. Open method treatment of burns with aerosol spray. Amer J Surg 97:211-6, 1959. 12 refs.

Analysis of criteria for a local emergency spray for pain and report of experience with a preparation containing benzocaine in a special oil base (as an adjunct to exposure therapy).

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60. Kaplan, I.; White, W. L. Incisional decompression of circumferential burns. Plast Reconstr Surg 28:609-18, 1961. 9 refs.

Indications and techniques for incision through constricting eschars encountered in conjunction with exposure therapy of extremities.

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61. Kiskadden, W. S. ; Dietrich, S. R. Evaluation of exposure treatment of burns. Calif Med 77:365-8, 1952. '8 refs'.

Preliminary observations in 30 cases with exposure therapy.

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62. Kuba, E. F. First stage treatment of burns and prevention of shock. Indust Med Surg 26:369-71, 1957. 11 refs.

Short article advocating use of an aerosol spray containing 20% dissolved benzocaine for relief of pain and first aid use in combination with injection of analgesic drug. Experience in 700 industrial burns.

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63. Kyle, M. J. ; Wallace, A. B. The exposure method of treatment of burns. Brit J Plastic Surg 3:144-150, 1950. 3 refs .

Important reference article. Use of exposure therapy advocated to promote cool, dry surface and expedite management of acute extensive burns (Edinburgh).

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64. Larson, D. L.; Tumbusch, W. T.; Vogel, E. H., Jr., Mitchell, E. T.; Butkiewicz, J. V. Modified Exposure: A newer technique in the management of the burned patient, in Research in Burns, edited by C. P. Artz, AIBS, Pub No 9, Washington, D. C., 1962.

Experiences at the Surgical Research Unit at Brooke Army Medical Center over a 2-year period, employing exposure therapy for the early postburn phase and thereafter covering with fine-mesh petrolatum gauze prior to grafting and coarse-mesh gauze impregnated with paraffin (Parressed Lace Mesh Gauze, Abbott Laboratories) as a dressing for grafts. Results in 155 skin grafts on 55 patients.

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65. Lodigiani, E.; Grugni, C. Local treatment of 2nd degree burns with dried plasma, with added sulfonamides. *Minerva Chir* 16:1537-41, 1961. 11 refs.

Not reviewed. Available in the National Library of Medicine.

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66. Longuet, Y. J.; Hertz, C. Local treatment of burns by hydrolysate of yeast. *Presse Med* 66:183, 1958.

Summary of results in 22 patients.

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67. Lorthoir, J. Experimental study and treatment of burns. Acta Char Belg 60:535-7, 1961.

Not reviewed. Available in National Library of Medicine.

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68. Lowbury, E. J. ; Miller, R. W. ; Cason, J. S. ; Jackson, D. M. Local prophylactic chemotherapy for burns treated with tulle gras and by the exposure method. Lancet 2:958-63, 1962.

Studies at Birmingham Accident Hospital with prophylactic topical chemotherapeutic agents employed in both closed and open methods of local care. Neomycin-chlorhexidine tulle gras was considered superior to penicillin cream in dressings cases and "polybactrin" spray to penicillin-lactose powder in exposure patients.

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69. Luccioni, F., and others. Treatment of burns by the method of occlusive bags and individual oxygen and ozone tents, Marseille Chir 13:250-4, 1961.

Not reviewed. Available in National Library of Medicine.

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70. McDowell, F. Treatment of burns by occlusive pressure dressing, in *Current Surgical Treatment*, edited by Mulholland, J.G.; Ellison, E.H.; Frieson, S.R. W.B. Saunders Company, Philadelphia/London, 1957.

Discussion of compression dressings in relation to wound healing and use of other methods; technique of application.

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71. MacGregor, C.A., Pfister, R.R. The use of polyethylene glycol ointment in burns treated by exposure. *Surgery* 39:557-64, 1956. 15 refs.

Experiences in 24 patients with a mixture of bacitracin, neomycin, polymyxin B Sulphate, pyruvic acid, etc. in a soluble vehicle.

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72. Martin, J.D., Jr. Local burn care. *J Med Assn Georgia* 50:68-70, 1961. 17 refs.

Local therapy outlined including use of enzymatic debridement for small localized wound.

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73. Meade, R. J. The prevention of secondary tissue destruction in burns. *Plast Reconstr Surg* 21:263-71, 1958. 11 refs.

Use of surgical decompression to prevent the added trauma of vascular damage to primary destruction of tissue in burns. Case presentations.

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74. Menegaux, G.; Detrie, P. Local treatment of burns with trypsin. *Presse Med* 63:1356-7, 1955.

Report of 3 cases treated with enzymatic debridement.

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75. Moncrief, J. A., Switzer, W. E.; Rose, L. R. The treatment of hand burns. *Milit Med* 128:50-5, 1963.

General principles of hand care (adequate circulation and elevation, early skin coverage, vigorous and early physiotherapy) with note that hands are involved in over 80% of burns seen at the Surgical Research Unit, Brooke Army Medical Center.

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76. Morelewicz, H. V. Hydrotherapy in severe burn cases. New York J Med 56:1620-1, 1956.

Use of tub baths at 102°F for 20-30 minutes in post-shock phase, in preparation for grafting, (Hubbard tank) and for underwater exercise.

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77. Muir, I. F. K. The treatment of electrical burns. Brit J Plast Surg 10:292, 1958.

Recommendation that deep burns be excised early with application of a full-thickness flap unless vascular thrombosis is present in which case grafting should be delayed, as in high tension wire electrical burns.

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78. Mussinelli, F., Piotti, F. Burns of the hand and their cicatricial complications. Minerva Chir 17:872-88, 1962.

Not reviewed. Available in the National Library of Medicine.

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79. Ofeigsson, O. J. Observations and experiments on the immediate cold-water treatment for burns and scalds. *Brit J Plastic Surg* 12:104-119, 1959. 10 refs.

History of use of cold since 1936 in the treatment of burns. Report of rat experiments to simulate human scalds and recommendation of use of ice water as first-aid treatment.

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80. Ofeigsson, O. J. First-aid treatment of scalds and burns by water cooling. *Postgrad Med* 30:330-8, 1961. 4 refs.

Report of experimental data in rats (See previous article) and suggested outline of first-aid therapy, employing removal of heated clothing and immersion in cool water or application of cold compresses "until the doctor comes."

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81. Opitz, I. Conservative and surgical treatment of burn contractures. *Arch Orthop Unfallchir* 52:148-54, 1960.

Report of definitive procedures and measure for prevention of burn scar deformities.

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82. Ostapowicz, G. Treatment of burns with a cellulose preparation. Muenchen Med Wschr 98:1213-6, 1956. 41 refs.

Not reviewed. Available in the National Library of Medicine.

83. Penn, J. The use of apparatus in the treatment of extensive burns of the legs. Brit J Plast Surg 5:283-5, 1952.

Prevention of complications in deep leg burns by use of an orthopedic device for positioning and exercising while at bed rest.

84. Pigeon, J. Treatment of second-degree burns with amniotic membranes. Canad Med Assn J 83:844-5, 1960. 3 refs.

Use of amniotic membranes from a tissue bank to protect partial-thickness burns, contraindicated in full-thickness lesions.

85. Pilegio, A. Pharmacology and properties of B-phenoxyethanol. An alcohol with anti-pyocyanic action for use as an antiseptic in vehicles for unguents, ointments, creams and emulsions, particularly indicated for burns, wounds and dermatology. Friuli Med 16:113-24, 1961.

Not reviewed. Available in the National Library of Medicine.

86. Poliakov, V. A. A film of rapidly solidifying liquid plasma for primary covering of burns. Khirurgiia (Moskva) 35:13-6, 1959.

Not reviewed. Available in the National Library of Medicine.

87. Pugsley, L. Q.; Taylor, P. H.; Pruitt, B. A., Jr.; Vogel, E. H., Jr. Management of a thermal burn of the male genitalia. J Urol 88:653-4, 1962.

Short case report in which uninvolved prepuce tissue was utilized for cover of lateral surfaces of the penis.

88. Reynolds, L. E., and others. Effects of local chilling in the treatment of burns. Surg Forum 6:85-7, 1955.

Report of experimental reduction of local edema by immersion of burn within 1 minute of injury into cold water. Treatment for 15-30 minutes.

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89. Roodhouse, J. W. Physical therapy for burn injuries. Phys Ther Rev 41:432-5, 1961. 9 refs.

Short general article on role of physical therapist in the rehabilitation program for the burn patient.

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90. Samohyl, J.; Rieblova, V. Some improvements in the technique of dressing severe burns and in the preparation of granulation surfaces for transplantation. Acta Chir Plast 4(1):8-17, 1962.

Use of Brno (Karfik director) of large burn pads stitched with tapes and designed to resemble clothing. Easily and quickly applied and held in place with stockinette. May be employed as dressings irrigated by use of Carrel drains threaded into the inner layer of gauze.

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91. Schroeder, H.; Hutschenreuter, K. Experiences with andantol jelly in local therapy of superficial burns. Med Welt 2(35):1788-90, 1961. 7 refs.

Not reviewed. Available in the National Library of Medicine.

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92. Schulman, A.G. Ice water as primary treatment of burns; simple method of emergency treatment of burns to alleviate pain, reduce sequelae and hasten healing. JAMA 173:1916-9, 1960. 6 refs.

Experiences with a large series of burns of less than 20% employing application of cold compresses or immersion of injured part in ice water.

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93. Sedlmaier, R. Practical experience with a new gel for burns. Muenchen Med Wschr 104:239-40, 1962.

Use of gel for burns and other pathology.

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94. Sokolic, I.H.; Howard, J.M.; Ulin, A.W.; Foreman, J. Evaluation of topical therapy in second-degree burns, in Research in Burns, edited by C. P. Artz, AIBS, Pub No 9, Washington, D. C., 1962.

In an evaluation of minor burn therapy regimens that can be administered by lay personnel, it was found that 2 drugs (vaseline gauze and phisohex) were superior when evaluated from the viewpoint of healing time of the burn wound. Human volunteers used in this study.

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95. Spangler, P. E. A new local treatment of burns. U. S. Armed Forces Med J 3:105-14, 1952. 6 refs.

Report of 22 cases treated with a gel of hydrolized casein, sodium lactate, and sodium lauryl sulfate covered by 4-ply coarse-mesh gauze impregnated with zinc acetate.

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96. Tala, P.; Pantzar, P. Observations on the effect of polyphloroglucin-phosphate in treatment of burns in the out-patient department. Duodecim 73:376-89, 1957. 21 refs.

Not reviewed. Available in the National Library of Medicine.

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97. Terry, J. L. ; Trabue, J. C. Additional uses of aluminum foil in the treatment of burns. Amer J Surg 101:428-30, 1961. 5 refs .

Use of foil as dressing over granulations and to prevent adherence of raw wounds to bed clothing or operating table sheets.

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98. Testa, V. ; Cerbini, F. M. On the use of various esters of malic acid and other organic acids in the local treatment of burns Minerva Chir 14:1148-54, 1959. 13 refs .

Not reviewed. Available in National Library of Medicine.

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99. Thielen, R. G. ; Markenstein, A. Burns and their treatments, with special regard to surface treatment Chirurg 32:417-23, 1961.

Use of a spray of terramycin and hydrocortisone followed by open treatment.

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100. Vernon, S. A simplified immediate treatment of burns. J Int Coll Surg 34:547-9, 1960.

Examination of the feasibility of the first-aid treatment with cold water proposed in treatment of mass burns.

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101. Walden, R. H.; Rabin, L. R. The problem of repair of the burned hand. Bull Hosp Joint Dis (NY) 13:259-68, 1952.

General principles of management of hand burns with use of local ointments, early active and passive motion, early grafting, use of Bunnell and other splints.

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102. Wilson, C. E.; Kimball, K. F., Swenson, J. A., Jr. The exposure method of burn treatment. AMA Arch Surg 71:424-30, 1955. 11 refs.

Experiences with exposure therapy with and without topical agents. Hydrocortisone ointment felt to be contraindicated.

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103. Yin, C. T., and others. Exposure treatment of burns. Chin Med J 80:578-9, 1960.

English abstract of report of 320 burns (265 hospitalized) in 3-year period. Mortality of 4%. Staph aureus most predominant organism. Use of exposure in combination with burn pads in circumferential burns. Early excision for burns of less than 20%. Surface disinfectants employed as an adjunct to exposure. No discussion of supportive therapy.

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VII

ANESTHESIA

PRE-GRAFTING AND GRAFTING TECHNIQUES

VII

ANESTHESIA

PRE-GRAFTING AND GRAFTING TECHNIQUES

1) ANESTHESIA

1. Altissimi, C. Anesthesia in the reparative treatment of burn injuries. G Med Milit 110.58-63, 1960

Not reviewed. Available in the National Library of Medicine.

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2. Benway, Robert E.; Maier, E.S., Jenicek, J.A. Anesthetic Management of the Severely Burned Patient, Amer J Surg 103:6, 577-687, 1962. 16 refs.

Comprehensive article for reference from the Surgical Research Unit, Brooke Army Medical Center. Detailed techniques for each phase of anesthetic management on basis of physiologic and pathologic changes. Discussion of special problems of myocarditis, endotracheal intubation indications and problems, hypoanalgesia, inadvertent hypothermia in the Operating Room, impaired pulmonary diffusion and arterial oxygen desaturation.

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3. Bush, G.H., Graham, H.A., Littlewood, A.H., Scott, L.B. Danger of suxamethonium and endotracheal intubation in anesthesia for burns. *Brit Med J* 5312:1081-5, 1962.

Report of cardiac arrest in burn patients during induction of anesthesia due to vagal overactivity from administration of suxamethonium or to intubation. Preventive i-v atropine injection advocated.

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4. Davies, M.R. Analgesia for burn dressing. *Lancet* 2:710-3, 1959. 7 refs.

Not reviewed. Available in the National Library of Medicine.

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5. Finer, B.L.; Nylén, B.O. Cardiac arrest in the treatment of burns, and report of hypnosis as a substitute for anesthesia. *Plast Reconstr Surg* 27:49-55, 1961. 10 refs.

Report of increased incidence of cardiac arrest immediately following intubation in operative procedures for burns as compared with other conditions. Subsequent use of hypnotic analgesia in susceptible individuals.

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6. Merriam, T. W., Jr. The effect of pentobarbital anesthesia on the hemodynamic response to thermal burn. U.S. Naval Medical Field Research Laboratory Camp Lejeune, North Carolina (Report) 1961, 11 (#14) 10 p. 15 refs.

Not reviewed. Available in the National Library of Medicine.

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7. Middleton, H. Anaesthesia for Burned Children. Proc Royal Soc of Med 50:883-892, 1957. 17 refs.

A general article on the use of anesthesia (for premedication, for surgery of severe burns, and in the recovery period) in burn cases involving children. Based on clinical work with 500 cases.

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8. Middleton, H. G., Wolfson, L. J. Anesthesia in burns. Brit Med Bull 14:42-5, 1958.

Outline of the anesthetist's role in resuscitation, blood loss estimation, transfusion and anesthesia during surgical procedures.

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9. Muir, B.J., Evans, V.; Mulcahy, J.J. Sernyl analgesia for children's burn dressings. A preliminary communication. *Brit J Anaesth* 33:51-3, 1961. 11 refs.

Review of agents employed for analgesic purposes and report of use of sernyl in 50 cases. Complete analgesia in 78%, transient side-effects in 50% of children over five.

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10. Murazyan, R.I. Anaesthesia in the Surgical Treatment of Burns. *Acta Chir Plastic* 3(4):299-304, 1961. 12 refs.

A study on the choice of the type of anesthesia to be used in surgery of burns along with an evaluation of the "take" of grafts with reference to the type of anesthesia used.

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11. Pickrell, K.L., Stephen, C.R., Broadben', T.R.; Masters, F.W., Georgiade, N.G. Self-induced "trilene" analgesia in plastic surgery with special reference to the burned patient. *Plast Reconstr* 9:345-54, 1952. 26 refs.

General discussion of pain responses followed by summary of experience at Duke University Hospitals with tri-chlorethylene administered through a special face mask and controlled and regulated by the patient himself. Advantages listed together with specific indications.

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12. Rook, J. R. Management of anaesthesia of the severely burned patient. *Lancet* 1:1214-8, 1953. 5 refs.

Outline of anesthetic techniques employed at Birmingham Accident Hospital, 1948-1953, with analysis of poor risk factors and complications encountered.

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13. Walczok, F.; Dostal, J., Kalina, J. Anaesthesia in burns. *Acta Chir Plast (Praha)* 4:299-304, 1962.

Presentation of the pathophysiology of burn wounds as it concerns the anesthetist, along with recommendations of types of anesthesia to be used for adults and children when changing dressings.

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ANESTHESIA

PRE-GRAFTING AND GRAFTING TECHNIQUES

2) CHEMICAL DEBRIDING AGENTS

1. Berman, S.; Lowenthal, J. P.; Webster, M. E.; Altieri, P. L. Gochenour, R. B. Factors affecting the elaboration by Clostridium Histolyticum of proteinases capable of debriding third degree burn eschars on guinea pigs. J Bact 32:582-8, 1961. 14 refs.

Experimental studies with relation to debriding agents in the laboratory animal.

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2. Birkel, R. The dissolution of necrosed tissue by a pancreatic ferment. Muenchen Med Wschr 94:1078-9, 1952. 6 refs.

Topical Agent for Debridement. Early study.

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3. Connell, J. F., Jr., Rousselot, L. M. The use of proteolytic enzymes in the debridement of the burn eschar. Surg Forum 4:422-7, 1953. 8 refs.

Debriding Agents: Preliminary Report.

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4. Guzman, A. V.; Guzman, M. G. S. de. The enzymatic debridement of suppurations, necrotic lesions and burns with papain. J Int Coll Surg 20:695-702, 1953. 4 refs.

Report of favorable experience with papain in 20 patients with a variety of conditions, including 6 partial-thickness and 6 full-thickness burns.

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5. Howes, E. L.; Mandl, I.; Zaffuto, S.; Ackermann, W. The use of Clostridium histolyticum enzymes in the treatment of experimental third degree burns. Surg Gynec Obstet 109:177-88, 1959. 11 refs.

A report of extensive studies in experimental third degree burns.

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6. Kirschbaum, S., and others. Enzymatic debridement of sloughs due to burns. Prensa Med Argent 41:1285-8, 1954.

Not reviewed. Available in the National Library of Medicine.

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7. Liljedahl, S.O.; Backdahl, M. Enzymatic treatment of deep burns. Experience with a new preparation: ethizyme. Acta Chir Scand 118:372-8, 1959/60. 4 refs.

Clinical trial of ethizyme in seven cases with deep burns and three cases with post-surgical skin necrosis. Favorable results reported with only minor complications.

8. Otterman, M.G.; Stahlgren, L.H. A laboratory method for the quantitative measurements of the lysis of burn eschars in animals by chemical debriding agents. Surg Forum 13:41-3, 1962.

Use of guinea pigs in an experiment designed to measure quantitatively the effects of nine proteolytic enzymes in the lysis of burn eschars.

9. Palow, A.A. Treatment of third degree burn with tryptar ointment. Illinois Med J 115:145-6, 1959. 2 refs.

Case reports of local treatment with chemical debriding agents.

10. Pannella, A.; Ruozzi, P. Stimulating action of trypsin and of chemotrypsin in removal of necrotic tissue. Riv Pat Clin 16:211-6, 1961. 22 refs.

Not reviewed. Available in the National Library of Medicine.

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11. Sautter, R.D.; Buckwalter, J.A.; Ziffren, S.E. Chemicals and enzymes in debridement of thermal burns. AMA Arch Surg 76:744-8, 1958. 11 refs.

Clinical experience in 16 patients with small localized burns with 40% salicylic acid followed 24 hours later by application of ficin in pyruvic acid for 48 hours.

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12. Shelby, R.W.; Taylor, L.E., Garnes, A.L., Prigot, A. Enzymatic debridement with activated whole pancreas. Amer J Surg 96: 545-3, 1958. 5 refs.

Nine Case Reports of use of Viokase.

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13. Webster, M. E.; Clark, W. R.; Conklin, D. A.; Altieri, P. L. Berman, S.; Lowenthal, J. P.; Cochenour, R. B. Biological assay of proteolytic enzymes capable of debriding third degree burn eschars. *Proc Soc Biol Med* 107:79-83, 1961. 9 refs.

A report on a method of bioassay of four proteolytic enzymes to test their effectiveness in debriding 3rd degree burn eschars; guinea pigs were used as experimental animals.

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14. Wilde, N. J.; De.ry, G. Enzymatic debridement of burns: Tryptar. *Plast Reconstr Surg* 12:131-7, 1953. 24 refs.

Short review of other debriding agents and report of use of Tryptar in an acute burn.

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VII

ANESTHESIA

PRE-GRAFTING AND GRAFTING TECHNIQUES

3) PREGRAFTING AND GRAFTING PROCEDURES

1. Artz, C. P.; Bronwell, A. W.; Sako, Y. . The exposure of donor sites. *Ann Surg* 142:246-51, 1955. 3 refs.

Technical report of simplified handling of donor areas, method employed by a number of centers.

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2. Backdahl, M.; Liljedahl, S. O.; Troell, L. Excision of Deep Burns, *Acta Chir Scand* 123:351-359, 1962. 17 refs.

Experiences with early excision of the burn eschar.

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3. Bianco, T. Skin grafts in the treatment of burns. *Arch Ital Chir* 76:240-8, 1953.

General article.

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4. Bogetti, M., Fabri, S. Application of the immuno-paralytic technic in homografting of the skin, clinical observations in severe burns. *Minerva Med* 2:312-15, 1956. 5 refs.

Not reviewed. Available in the National Library of Medicine.

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5. Bowe, J. J. Primary excision in third degree burns. *Plast Reconstr Surg* 25:240-7, 1960. 13 refs.

Massive Early Excision. Case reports in seven patients with immediate grafting.

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6. Brown, J. B., Fryer, M. P.; Randall, P.; Lu, M. Postmortem homografts as "biological dressings" for extensive burns and denuded areas. Immediate and preserved homografts as life-saving procedures. *Ann Surg* 138:618-30, 1953. 25 refs.

Reference article on cadaver grafts.

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7. Brown, J. B., Fryer, M. P. Postmortem homografts to reduce mortality in extensive burns. Early "biological" closure and saving of patients for permanent healing, use in mass casualties and in national disaster. JAMA 156:1163-6, 1954.

Mass casualty implications of use of postmortem homografts in severe extensive burns.

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8. Bulacio Nunez, A. W. Grafts in burned patients. Prensa Med Argent 47 2225-31, 1960. 8 refs.

Evidence of employment of sheet grafts in preference to postage stamp grafts. Institute of Burns and Plastic Repair, Buenos Aires.

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9. Colson, P., Stagnara, P., Houot, R.; Leclercq, P. Accelerated treatment of severe burns. Lyon Chir 50:16-27, 1955.

Report of two cases of early massive surgical excision (approximately 50%) with good results.

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10. Cramer, L.M.; McCormack, R.M.; Carroll, D.B. Progressive partial excision and early grafting in lethal burns. *Plast Reconstr Surg* 30:595-9, 1962.

"Salvage" of four of patients estimated to be in 95% (+) mortality group (University of Rochester).

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11. Cramer, L.M.; Carroll, D.B., McCormack, R.M. Accelerated excision and grafting in the lethal burn. *Surg Forum* 11:462-4, 1960. 5 refs.

Presentation of experiences with early excision in stages on McCormack's service at University of Rochester.

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12. Demjen, S. The Surgical Treatment of Granulating Wounds Following Deep Burns, Using Thick-Split Skin Grafts. *Acta Chir Plasticae*, 3 (2):126-130, 1961. 9 refs.

Case reports with discussion of improved cosmetic results following removal of granulation tissue and use of thick partial-thickness grafts.

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13. Edgerton, M. T., Jr., Immediate reconstruction of the injured hand, Surgery 36:329-43, 1954. 13 refs.

Report of beneficial results following early excision.

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- 13a. Farmer, A. W.; Franks, W. R.; Young, D. M.; Maxmen, M., Chasmar, L. R. Effect of early excision on experimental burns. Brit J Plast Surg 7:289, 1955.

Use of early excision at Hospital for Sick Children, Toronto.

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14. Frank, G. Primary and "accelerated" early plastic surgery for burns. Plast Reconstr Surg 23:313-30, 1959. 22 refs.

Report of 43 cases with excision and grafting in 48 hours and 16 within 3-14 days postburn.

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15. Galli, P., Salvaneschi, G. Relationship between the nutritional state, organic reactivity and the taking of skin autografts in cases of burn. Minerva Chir 12:1274-6, 1957. 14 refs.

Not reviewed. Available in the National Library of Medicine.

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16. Griswold, M. L. A series of 77 full-thickness skin burns with necrectomy immediately after electrolyte stabilization. *Plast Reconstr Surg* 27 374-80, 1961. 11 refs.

Study of a hospital treatment program designed to decrease the number of bed days per burn patient. A total of 77 cases were analyzed prior to instituting this program and 77 analyzed after the new program was started. Hospital bed days decreased from 28.7 days to 22.4 with removal of slough usually between the 3rd and 7th day postburn.

17. Hyroop, G. L. The importance of early coverage in the treatment of burns. *J Int Coll Surg* 34:363-7, 1960. 15 refs.

A short general article advocating early coverage in extensive burns with early debridement, autografts and homografts.

18. Jackson, D.M., Topley, E.; Cason, J.S., Lowbury, E.J.L. Primary excision and grafting of large burns. *Ann Surg* 152:167-89, 1960. 17 refs.

Reports of massive debridement in extensive burns (at Birmingham Accident Hospital) carried out successfully but without spectacular results in terms of ultimate mortality. Immediate or very early excision of acute burns recommended only for deep burns of minor extent, the major drawbacks being the severity of stress of major surgery in extensive burns and inability to distinguish between areas of deep second-degree and third-degree involvement in some instances (etiology is perhaps the safest guide).

19. Jackson, D. Extensive primary excision and grafting of deep burns, in Research in Burns, edited by C. P. Artz, AIBS, Pub No 9, Washington, D. C., 1962.

Summary of previous studies in 45 patients at the Birmingham Accident Hospital with burns up to 20-30% of the body surface. In extensive lesions complete wound closure could not be achieved. No conclusion as to ultimate effect on infection and mortality but present opinion that massive early excision "entails more trouble and anxiety than delayed grafting at two to three weeks."

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20. Kiehn, C. L.; Desprez, J. D. Skin grafting of burns. J Occup Med 3(4):193-7, 1961.

General article on skin grafting in burn injuries, including notes on early surgical management, types of skin grafts, methods of obtaining grafts, and surgical dressings following grafting.

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21. Lehmann, A. L.; Hay, L. J. A controlled pressure plastic dressing for skin grafting, burns and thrombophlebitis. Surgery 35:401-4, 1954. 11 refs.

To meet the need for a surgical dressing that "exerts uniform pressure" and is simple to apply, the authors devised a transparent, pneumatic polyvinyl plastic sheath for dressings of the arm and leg. This was a preliminary report on its use, in three cases. Some problems encountered were sensitivity reaction to the polyvinyl plastic and moisture collection if dressing was applied directly to the skin.

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22. London, P.S. The burnt foot. Brit J Surg 40-293-304, 1953. 14 refs.

A detailed article on the treatment of the burned foot, emphasizing the value of primary excision and grafting of completely destroyed skin, and indicating the suitability of split-skin grafts for replacement of burned skin on the foot, including its weight-bearing surfaces. Summary of 301 cases.

23. Lortholary, J. Treatment of burns by abrasion. J Bull Acad Roy Med Belg 2:535-44, 1962.

Report of treatment of burns by general methods, including 5% Sorbitol inactivators, of Proteolytic Enzymes, Mercaptoethylamine and a "cellular protector" combined with abrasion.

24. MacMillan, B.G. Early excision of more than 25% of body surface in the extensively burned patient. AMA Arch Surg 77:369-75, 1958. 1 ref.

Report of comparative studies between 14 patients treated by early excision and 8 by conventional methods. No operative deaths. Morality rate in excisional group of patients was 42% as compared with 75% in the control series.

25. MacMillan, B. G. , Altemeier, W. A. Massive excision of the extensive burn. Research in Burns, edited by C. P. Artz, AIBS Pub No. 9, Washington, D. C., 1962.

Summary of experiences with massive excision over a 5-year period at the University of Cincinnati. 19 cases have been treated in comparison with 35 by conventional methods. Conclusion that early excision should be reserved for small to moderate areas of full-thickness burns.

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26. Macomber, W. B. ; Wang, M. K. H. , Versaci, A. Further evaluation of improved skin grafting technique for extensive third degree burns. Plast Reconstr Surg 21:254-262, 1958. 3 refs.

Study of the question of whether or not to remove granulations partially by slicing through exuberant tissue. In spite of the extre blood loss involved, better cosmetic results were obtained when granulations were removed in toto, although the procedure was applicable only for localized wounds.

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27. McDowell, F. Accelerated excision and grafting of small deep burns. Amer J Surg 85:407-10, 1953. 1 ref.

A report on the care of small or medium-sized burns by accelerated excision and skin grafting (usually by the end of the 1st week postburn).

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28. Meeker, I.A., Jr.; Snyder, W.H., Jr. Dermatome debridement and early grafting of extensive third-degree burns in children. Surg Gynec Obstet 103:527-34, 1956. 9 refs.

Report of a technique devised by Meeker and Snyder for local handling of acute burns in preparation for grafting consisting of serial dermatome debriding procedures which remove only the upper layers of necrotic tissue and are carried in depth only to the point where minute bleeding points are reached.

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29. Nystrom, G. Sowing of small skin graft particles as a method of epithelization especially of extensive wound surfaces. Plast Reconstr Surg 23:226-39, 1959. 7 refs.

To help solve the problem of skin covering for large burn wound surfaces as quickly as possible, a technique for "sowing" miniature skin grafts is advocated. A cutting apparatus which will cut a split skin graft into small graft particles of approximately a 1-mm. area is described.

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30. Pattin, M., Hashiba, A., Cabrera, N. Treatment of deep burns in the sole of the foot with autografts. Sem Med (B Air) 117:1247-8, 1960.

Case history with photographs of severe full-thickness lesions involving the lower extremity and the sole of the foot.

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31. Razemon, J. P. Repair of loss of substance of the scalp after burns. *Ann Chir Plast* 5:187-96, 1960. 15 refs.

General discussion of etiology and therapy of deep scalp burns with case histories and diagrams of zones involved for grafting.

32. Schumer, W. Method for removal or debridement of burn wound eschar. *AMA Arch Surg* 79:630-1, 1959.

Experience with hydrotherapeutic debridement of burn wound eschar by immersing the patient in the Hubbard whirlpool tank; 35 cases reported.

33. Skoog, T. A follow-up study of the late results of skin grafts, in *Research in Burns*, edited by C. P. Artz, AIBS, Pub No 9, Washington, D. C., 1962.

General principles used by the author and his colleagues in the surgical treatment of burns, based on follow-up studies (between 1 1/2 and 4 years after final treatment) of 235 burn patients who required skin grafting.

34. Taylor, P.H.; Tumbusch, W.T.; Vogel, E.J., Jr.; Pruitt, B.A., Jr.; Pugsley, L.Q.; Rose, L.R. Early excision of full-thickness burns. Annual Report Project 6 x 59-01-001 Task 04 U.S. Army Surgical Research Unit, Brooke Army Medical Center, 1961.

Not reviewed. Available in the National Library of Medicine.

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35. Taylor, P.H.; Moncrief, J.A., Pugsley, L.Q.; Rose, L.R.; Switzer, W.E. The Management of Extensively Burned Patients by Staged Excision. Surg Gynec and Obstet 115:347-352, 1962. 6 refs.

Preliminary report of experiences at the Surgical Research Unit, Brooke Army Medical Center, with staged excision in 19 patients with 40% - 82% burns. Outline of regimen employed.

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36. Titova, A. T. Local Plasty with Opposing Triangular Flaps in the Treatment of Scar Contractures of the Skin after Burns. Acta Chir Plast 4(2):156-64, 1962.

Demonstration of techniques devised by Limberg (Institute of Traumatology and Orthopedics, Leningrad) for treatment of scar contractures. Outline of patterns and discussion of indications for their use.

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37. Vesalio Guzman, A.; Stein de Guzman, M. G. A new concept in the treatment of burns. Open treatments and enzymatic debridement. *Rev Med Costa Rica* 14:37-48, 1955. 8 refs.

Not reviewed. Available in the National Library of Medicine.

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38. Vilain, R., Perdu, J. C. Critical analysis of the "dressing-graft with hydrocortisone" on granulation. *Ann Chir Plast* 4:197-215, 1959.

Not reviewed. Available in the National Library of Medicine.

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39. Whittaker, A. H. Treatment of burns by excision and immediate skin grafting. *Amer J Surg* 85:411-7, 1953. 12 refs.

A brief historical account of changes in burn treatment is given, followed by a discussion of techniques for immediate surgical excision and grafting, which the author considers particularly valuable for hands and feet.

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40. Wittels, W. On the possibilities and limitations of skin transplantation in very severe burns. *Arch Klin Exp Derm* 211:343-7, 1960.

Not reviewed. Available in the National Library of Medicine.

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VII

ANESTHESIA

PRE-GRAFTING AND GRAFTING TECHNIQUES

4) HOMOGRAFTS

1. Arneri, V. An 80% surface burn treated by massive skin homograft procedures. *Ann Ny Acad Sci* 99:922-32, 1962.

Case study of a 9-year-old boy with 80% body surface burns who was treated with homografts from his mother; graft survival was 4 weeks. Two other cases of 60% and 72% surface burns are also noted.

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2. Artz, C.P.; Becker, J.M.; Sako, Yoshio, Bronwell, A.W. Postmortem skin homografts in the treatment extensive burns. *AMA Arch Surg* 71:582-7, 1955. 6 refs.

Short article on effectiveness of cadaver homografts as biological dressing in severe burns. Surgical Research Unit experience.

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3. Ashley, F.L.; McNall, E.G.; Sloan, R.F.; Taylor, J.; Garcia, E.N. Studies on mammalian homotransplants of skin following thermal burns. *Research in Burns*, edited by C.P. Artz, AIBS Pub No. 9, Washington, D.C., 1962.

Study on the effect of the burn state on homograft survival in rats with standardized steam burns

with hypothesis that large homografts of the size employed survive for longer periods than small ones up to a point at which maximum antigenic response would be observed. Homografts applied 4 days following burning survived for a shorter period than those applied 24 hours after injury.

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4. Budrass, W. Research on preservation of human skin, in Research in Burns, edited by C. P. Artz, AIBS Pub No. 9, Washington, D. C., 1962.

Discussion of preservative techniques for human skin including information on freezing temperatures, storage, the effect of various temperatures on tissue proteins, etc.

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5. Chardack, W.M.; Brueske, D.A.; Santomauro, A.P.; Fazakas, G. Experimental studies on synthetic substitutes for skin and their use in the treatment of burns. Ann Surg 155:127-39, 1962. 9 refs.

Report on synthetic homografts with review of principle materials evaluated to date.

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6. Colson, P., and others. Utilization of homografts alternated with autografts in the treatment of large burns, histological study. *Ann Chir Plast* 4:177-86, 1959.

Report from Lyon Group on advantages of employing simultaneous homografts and autografts.

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7. Colson, P., Prunier, M. Treatment of severe burns. The behavior of the skin graft (auto-and-homograft) in the McWiem-Jackson procedure. *Lyon Chir* 56:182-98, 1960. 18 refs.

Histological studies of alternating homografts and autografts.

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8. Dogo, G. Lyophilized homologous skin in the therapy of the deep burns. *Acta Chir Ital* 17:141-54, 1961.

Experiences with lyophilized homografts supplied by the Tissue Bank at Bethesda in the burns center at Padua.

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9. Dogo, G. Clinical and experimental research on burns; treatment with homologous lyophilized skin, in Research in Burns, edited by C. P. Artz, AIBS, Pub No 9, Washington, D. C., 1962.

Review of use of lyophilized skin (34,485 sq. inches in 16 patients) as biological dressing in extensive burns. Histologic aspects and general conclusions.

10. Georgiade, N.; Georgiade, R.; Eiring, A.; Stocker, F. W.; Matton Van Leuven, M. Th. Long-term storage of skin and corneas for grafting after burns, in Research in Burns, edited by C. P. Artz, AIBS, Pub No 9, Washington, D. C., 1962.

Report of 5-year storage project at Duke University School of Medicine with evaluation of viability of 1) human skin by oxygen consumption, enzyme activity as measured by reduction of tetrazalium dye and tissue culture; 2) of animal skin by simultaneous autografts and tissue cultures; and 3) of corneas by tissue culture techniques for epithelium, stroma and endothelium. Technique of storage: 45°C in 20% glycerol preservative fluid.

11. Gnsburg, R. L. Homoplasty in the Treatment of Extensive Burns. Acta Chir Plast 3(1):27-34, 1961.

Summary of therapy at Central Institute of Traumatology and Orthopedics, Moscow including use of novocaine block, transfusions, colloids, penicillin, streptomycin, vitamins, cardio-tonics. Also experiences with homografting, employing cadaver skin.

12. Good, R. A.; Varco, R. L. Successful homograft of skin in a child with agammaglobulinemia. *AMA* 157:713-6, 1955.

Persistence of 3 x 8 cm. homograft for four weeks in a 7-year-old burn patient with agammaglobulinemia (University of Minnesota).

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13. Groote, F. de. Extensive burns treated with alternating strips. *Ned T Geneesk* 105:874-7, 1961.

Not reviewed. Available in the National Library of Medicine.

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14. Holden, W. D., Hubay, C. A., Powell, A. E. Homologous tissue transplantation immunity. Summary in *Research in Burns*, edited by C. P. Artz, AIBS, Pub No 9, Washington, D. C., 1962.

Summary paper presented at the First International Congress of Research in Burns in 1960. Discussion of factors concerned with attenuation or abolition of transplantation immunity and outline of current research efforts to alter the specificity of transplantation antibody by introducing a variety of aminoacid analogues, aminoacid antagonists and antimetabolites.

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15. Jolley, W. B.; Hinshaw, D. B., Peterson, M. The effect of Ribonucleic acid on homograft survival. Surgical Forum, Clinical Congress, American College of Surgeons, 12, 99-101, 1961. 1 ref.

Report of prolonged take employing Ashley's techniques, of ribonucleic-acid treated cadaver skin in one human burned patient and of specific enzymatic activity to explain the homograft rejection mechanism.

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16. Kepes, L.; Georgiade, N.; Eiring, A.; Pickrell, K. Evaluation of postmortem survival of skin by tissue culture methods. Plast Reconstr Surg 21:483-6, 1958. 12 refs.

Study of length of time after death in which human cadaver skin is viable under standard hospital conditions, with finding that skin taken from cadavers stored at 4°C and removed as long as 32 hours following death was viable in tissue culture.

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17. MacMillan, B. G. Homograft skin, a valuable adjunct to the treatment of thermal burns. J Trauma 2:136-41, 1962. 6 refs.

Clinical study of the use of homografts from temporary wound coverage in 50 patients, including indications, sources, storage methods, techniques, and survival period.

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18. Morger, R., McCle, R. On the immediate transplantation of maternal skin burns in infancy and childhood. *Z Unfallmed Berufskr* 54:101-3, 1961.

Not reviewed. Available in the National Library of Medicine.

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19. Patterson, J. B. One in a million homografting between identical twins, a case report. *Plast Reconstr Surg* 25:510-6, 1960. 14 refs.

A case study of a 5-year-old identical twin with full-thickness burns over 68% of her body, who was resurfaced with homografts (from her twin sister) totaling 570 sq. inches and with autografts of an additional 90 sq. inches. Total hospital stay was 52 days.

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20. Sell, K. W.; Hyatt, G. W.; Gresham, R. B. The status of the freeze-dried skin homograft in the severely burned patient in *Research in Burns*, edited by C. P. Artz, AIBS, Pub No 9, Washington, D. C., 1962.

Extensive report of lyophilized skin project at the Tissue Bank, U. S. Naval Medical School at Bethesda, Md., from 1951-1960. Project has involved 300,000 sq. inches of stored skin utilized by 72 physicians in 103 severe burns. Discussion of methodology, probit analysis of 89 cases, estimated percentage of primary take (80%), persistence (19 days average), lack of antigenic response, indications, comparison with data regarding fresh homografts.

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VIII

ANTIBIOTIC THERAPY AND INFECTION

ANTIBIOTIC THERAPY AND INFECTION

1. Addison, N. V. Tetanus following skin grafting for burns. *Brit J Plast Surg* 9:232-4, 1956. 7 refs.

Case Report and discussion.

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2. Altermeier, W. A.; Wulsin, J.H. Antimicrobial therapy in injured patients. *JAMA* 173:527-533, 1960. (15 refs).

Systemic therapy and burn complications. Authoritative review of present trends in therapy of burns and other trauma, with recommendations for treatment.

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3. Altemeier, W. A. Studies on the nature and control of sepsis in thermal and combined thermal-irradiation injuries. Annual Report Army Contract DA-49-193-MC-2094, 1961.

Unpublished research data from University of Cincinnati Medical School Burn Service.

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4. Altmeier, W.A.; MacMillan, B.G. The dynamics of infection in burns, in Research in Burns, edited by C.P. Artz, AIBS, Pub No 9, Washington, D.C., 1962.

A study of 1683 patients between 1942 and 1960 in an attempt to determine the effectiveness of chemotherapeutic and antibiotic agents in preventing and controlling postburn infections.

5. Altmeier, W.A. Infections. Summary in Research in Burns, edited by C.P. Artz, AIBS, Pub No 9, Washington, D.C., 1962.

Summary of papers concerning current research on infection following burns, presented at First International Symposium on Research in Burns. Includes brief discussions of the varying opinions on the effectiveness of antibiotic therapy, the influence of gram-negative bacteria, the role of skin grafting in combatting infection, and emphasis on the need for further research.

6. Baker, T.J.; Peterson, J.E. An apparently proteolytic fungus isolated from a burn patient. Plast Reconstr Surg 24:209-13, 1959.

Case report of severe burn contaminated with the fungus *Fusarium roseum*, a plant parasite or soil saprophyte. Proteolytic activity actually aided in separation of the eschar.

7. Balikov, B.; Artz, C.P.; Solometo, D.F. Serum gamma globulin in the burned patient, with special reference to septicemia. U.S. Armed Forces Med J 3:321-31, 1957. 14 refs.

Measurement of gamma globulin levels in normal and burned patients at Surgical Research Unit, Brooke Army Medical Center.

8. Barclay, T.L.; Crockett, D.J., Warshavski, E. Mortality in a Burns Unit, with Reference to Antibiotics, Acta Chirurgiae Plasticae 3 (1):5-10, 1961, 2 refs.

Statistical study of 335 patients with reference to mortality based on data obtained at Mt. Vernon Plastic Surgery Center. Emphasis on infection in spite of therapy.

9. Benaim, F. and others. Contribution to the problem of staphylococcal infections in burns. Med Panamer 15 Spec No Pt 2: 629-31, 1961.

Article based on experiences at Institute of Burns and Plastic Repair, Buenos Aires.

10. Blocker, T.G., Jr.; Bass, J.A.; Lewis, S.R.; Eade, G.G.
General aspects of microbial growth in the burns wound. *Amer J Surg* 95:309-11, 1958. 6 refs.

General article on wound colonization, infection,
and methods of management.

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11. Blocker, T.G., Jr.; Lewis, S.R.; Jacobson, H.S.; Grant, D.A.
Bacterial contamination and infection in the severely burned patient.
Texas J Med 55:358-60, 1959. 11 refs.

General article. See previous reference.

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12. Cason, J.S.; Lowbury, E.J. L. Prophylactic chemotherapy for
burns. Studies on the local and systemic use of combined therapy.
Lancet 2:501-7, 1960. 14 refs.

Study from Birmingham Accident Hospital with data
on topical antibiotic preparations as well as systemic
agents.

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- 12a. Clarkson, P., Greenwell, F.P. Sepsis in burns. *Guy's Hosp Rep* 107:86-99, 1958. 9 refs.

Review of cases from Pediatric Burns Unit at
Guy's Hospital, London.

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- 13.. Connell, J.F., Jr.; Rousselot, E.M. The control of infections in the severely burned patient. Amer J Surg 95:684-7, 1958. 6 refs.

Outline of measures employed at St. Vincent's Hospital, New York: prophylactic antibiotics, mechanical cleansing, aseptic techniques, cultures of environmental and wound flora, early excision in burns under 15%, judicious use of enzyme debridement.

14. Davis, J.H. Staphylococcal infection in burns, in Research in Burns, edited by C. P. Artz, AIBS, Pub No 9, Washington, D. C., 1962.

A general survey of the problems involved in the treatment of infection in burns caused by Staph. aureus, including the development of strains resistant to antibiotics; bacterial factors; and local and systemic factors involved in bacterial growth.

15. Elfving, G.; Asp, K. Tetanus as a complication of burns. Duodecim 70:514-8, 1954. 10 refs.

Not reviewed. Available in the National Library of Medicine.

16. Farmer, A. W.; Franks, W. R.; Chasmar, L. R.; Young, D. M. A scarlatiniform rash in burns. *Canad Med Assn J* 73:297-8, 1955. (4 refs)

Report of 8 cases with rash in patients with staphylococcus aureus as the sole pathogen in the nose and throat.

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17. Graber, C. D.; Tumbusch, W. T.; Rudnick, R. P.; Vogel, E. H., Jr. Generalized Schwartzman-like reaction following *Serratia marcescens* septicemia in a fatal burn. *Surg Gynec Obstet* 110:443-50, 1960. (16 refs).

Detailed Case report of septicemia by causative chromogenic organism ordinarily considered non-pathogenic. Hypothesis that Schwartzman-like reaction occurred following endotoxemia supported by experimental data.

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18. Graber, C. D.; Cummings, D.; Vogel, E. H., Jr.; Tumbusch, W. T. Measurement of the protective effect of antibody in burned and unburned patients' sera for *Pseudomonas aeruginosa* infected mice. *Texas Rep Biol Med* 19:268-76, 1961. (11 refs).

Attempts to determine if antibody in the sera of burned and unburned individuals measured as native hemagglutinin was protective for mice with induced pseudomonas infection.

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22. Isakovlev, A.M.; Krasnopevtseva, O.S., Puterman-Lippert, F.E.; Petrova, E.K. Bacteremia as a pathogenic factor in burn sickness. *Khirurgiia (Moskva)* 38:34-40, 1962.

Not reviewed. Available in the National Library of Medicine.

23. Kefalides, N.A.; Arana, J.A.; Bazan, A.; Stastny, P. Clinical evaluation of antibiotics and gamma globulin in septicemias following burns, in *Research in Burns*, edited by C.P. Artz, AIBS, Pub No 9, Washington, D. C., 1962.

Study of 106 burned children and 10 adults who received gamma globulin and were compared with 102 children and 19 adults who did not receive it. In children between 4 mos. and 4 yrs. and in patients having burns of less than 20% surface area, the gamma globulin appeared to lessen the occurrence of septicemias and to reduce total late mortality.

24. Körlof, B. Investigations into different methods of treating pyocyanus-infected burns. *Acta Chir Scand* 107:244-257, 1954. 24 refs.

Treatment of experimental burns in guinea pigs with pyocyanus infections. Local agents were ineffective as were intramuscular injections of Polymyxin B. Exposure therapy, which promoted a dry wound, was more effective than other types of treatment.

22. Isakovlev, A.M.; Krasnopevtseva, O.S., Puterman-Lippert, F.E.; Petrova, E.K. Bacteremia as a pathogenic factor in burn sickness. *Khirurgiia (Moskva)* 38:34-40, 1962.

Not reviewed. Available in the National Library of Medicine.

23. Kefalides, N.A.; Arana, J.A.; Bazan, A.; Stastny, P. Clinical evaluation of antibiotics and gamma globulin in septicemias following burns, in *Research in Burns*, edited by C.P. Artz, AIBS, Pub No 9, Washington, D. C., 1962.

Study of 106 burned children and 10 adults who received gamma globulin and were compared with 102 children and 19 adults who did not receive it. In children between 4 mos. and 4 yrs. and in patients having burns of less than 20% surface area, the gamma globulin appeared to lessen the occurrence of septicemias and to reduce total late mortality.

24. Körlof, B. Investigations into different methods of treating pyocyanus-infected burns. *Acta Chir Scand* 107:244-257, 1954. 24 refs.

Treatment of experimental burns in guinea pigs with pyocyanus infections. Local agents were ineffective as were intramuscular injections of Polymyxin B. Exposure therapy, which promoted a dry wound, was more effective than other types of treatment.

25. Kurlat, F. B. Bacteriological considerations in burns. Sem Med 117:1870-1882, 1960.

Report of bacterial cultures in 29 burn patients
with review of methods and flora.

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26. Liedberg, N. C. F.; Kuhn, L. R.; Barnes, B. A.; Reiss, E.; Amspacher, W. H. Infection in burns. I. The problem and evaluation of therapy. Surg Gynec Obstet 98:535-40, 1954. 11 refs.

Studies in burn infection from the Surgical Research Unit, Brooke Army Medical Center. Description of facilities, general burn therapy techniques and protocol for bacteriologic studies and quantitation of data are presented against a background of chronological evolution of infection following thermal trauma.

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27. Liedberg, N. C. F.; Reiss, E.; Artz, C. P. Infection in burns. III. Septicemia, a common cause of death. Surg Gynec Obstet 99:151-8, 1954. 20 refs.

Infection studies at the Surgical Research Unit Brooke Army Medical Center. Report of wound culture studies with respect to graft failure, preparation of granulations and systemic infection. Effects of topical agents and penicillin.

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28. Liedberg, N. C. F.; Reiss, E.; Kuhn, L. R.; Amspacher, W. H.; Artz, C. P. Infection in burns. IV. Evaluation of the local use of chloramphenicol ointment and furacin soluble dressing on granulating surfaces following extensive full-thickness burns. *Surg Gynec Obstet* 100:219-31, 1955. 21 refs.

Experiences with local ointments and topical agents
at the Surgical Research Unit at Brooke Army
Medical Center.

29. Liedberg, N. C. F. Antibacterial resistance in burns. I. The effect of intraperitoneal infection on survival and the frequency of septicemia. *Acta Chir Scand* 120:88-94, 1960. 18 refs.

An experimental study in control and burned guinea
pigs injected with pyocyanus organisms with evidence
to show impairment of the antibacterial defense
mechanisms.

30. Liedberg, N. C. F. Antibacterial resistance in burns. II. The effect of unspecific humoral defense mechanisms, phagocytosis, and the development of bacteremia. *Acta Chir Scand* 121:351-8, 1961. 19 refs.

Guinea pig experiments designed to study differences
in bacterial growth in inoculated, incubated blood
plasma from burned and unburned animals. Differences
noted in cellular response to i-p injection of pseudomonas.
Discussion of implications.

31. Lowbury, E. J. L.; Crockett, D. J.; Jackson, D. M. Bacteriology of burns treated by exposure. *Lancet* 2:1151-53, 1954. 12 refs.

Not reviewed. Available in the National Library of Medicine.

32. Lowbury, E. J. L. Chemotherapy for *Staphylococcus aureus*; combined use of novobiocin and erythromycin and other methods in the treatment of burns. *Lancet* 2:305-10, 1957. 22 refs.

Studies from the Birmingham Accident Hospital with regard to development of resistance of strains of *Staph aureus* and therapeutic trial with novobiocin and erythromycin, in combination, by systemic administration. Discussion of effectiveness of antibiotic therapy on wound cultures in closed and open methods of management with conclusion that better response was obtained with dressings; however, routine chemotherapy against *Staph aureus* infection in the local wound was not recommended.

33. Lowbury, E. J. L. Infection of Burns. *B.M.J.* 1:994-1001, 1960. 69 refs.

Not reviewed. Available in the National Library of Medicine.

34. Lowbury, E. J. L. Clinical problems of drug-resistant pathogens. Brit Med Bull 16:75-78, 1960. 103 refs.

Not reviewed. Available in the National Library of Medicine.

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35. Lowbury, E. J. L.; Lille, H. A.; Miller, R. W. S.; Cason, J. S.; Jackson, D. M. Treatment of infected burns with methicillin. Lancet 1:318-31, 1961.

Comparative studies of antibiotics indicating that intramuscular methicillin is the drug of choice in treatment of staphylococcal infections and as effective against streptococcus pyogenes as oral tetracycline and erythromycin. Therapeutic effect of methicillin was greater in covered burns.

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36. Lowbury, E. J. L. Prevention and treatment of infection in burns, in Research in Burns, edited by C. P. Artz, AIBS, Pub No 9, Washington, D. C., 1962.

A series of investigations on the clinical value of prophylaxis and chemotherapy in the treatment of severely burned patients at Birmingham Accident Hospital.

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37. Lowbury, E. J. L. and Miller, R. W. S. Treatment of infected burns with BRL 1621. *Lancet* 2:640-1, 1962.

Trial in staphylococcal and streptococcus pyogenes infections in burns indicating that BRL 1621 by mouth is as effective as methicillin given intramuscularly.

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38. Lynch, J. B., Blocker, T. G., Jr.; Lewis, S. R. Studies of burn wound flora. Annual Report, Army Contract DA-49-007-MD-447, 1961.

Report of a decreasing number of positive pseudomonas cultures since 1958. Whether this phenomenon is related to thorough drying of burn surfaces by blotting techniques following mechanical cleansing and rinsing during dressing changes, or whether spontaneous variations have occurred in the environmental flora is a matter of conjecture.

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39. Markley, K.; Gurmend, G., Chavez, P. M., Bazan, A. Fatal pseudomonas septicemias in burned patients. *Ann Surg* 145:175-81, 1957. 110 refs¹.

Data on 172 children and 103 adults in USPHS "Peru Project" with burns of over 10%. Pseudomonas septicemias reported as major cause of death after 48 hours.

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40. Millican, R. C. Role of infection in the delayed deaths of mice following extensive burn injury, in *Research in Burns*, edited by C. P. Artz, AIBS, Pub No 9, Washington, D. C., 1962.

A series of experiments on mice which (1) demonstrates the presence of systemic infection during the first 10 days postburn, (2) indicates that chemotherapy lessens mortality during this period, and (3) reports the results of tests with rabbit pseudomonas antiserum for its ability to protect mice from fatal infections following burning.

41. Monasterio, F. O., Serrano-Rebel, A.; Barrera, G.; Araico, J.; Gutierrez-Bosque, R.; Estrella-Escobosa, J.; Ramirez-Barreto, F. Comparative study on the treatment of severe burns with and without antibiotics, in *Research in Burns*, edited by C. P. Artz, AIBS, Pub No 9, Washington, D. C., 1962.

Study of 100 burn patients with lesions of more than 20% treated without the use of antibiotics. Results were comparable so far as mortality was concerned, with a control series of the same number. Many of these patients had septicemia or repeated positive blood cultures for pathogenic organisms.

42. Moncrief, J. A.; Rivera, J. A. The problem of infection in burns by resistant micro-organisms, with note on use of bacitracin. *Ann Surg* 147:295-312, 1958.

Discussion of experiences at the Surgical Research Unit, Brooke Army Hospital with bacterial cultures and therapy of infection. *M. pyogenes* was the most common cause of septicemia; *proteus* and *pseudomonas* were next. Chloramphenicol, bacitracin, and novobiocin were the drugs of choice against pyogenes, although resistance developed rapidly. *Proteus* was sensitive to chloramphenicol but resistant to other agents. Polymyxin was employed against *pseudomonas*. Bacitracin was most useful against resistant staphylococcus. Novobiocin was of limited use. Report of attempts to develop a serum against *pseudomonas* organisms and discussion of symptomatology and methods of therapy.

43. Penikett, E. J. K., Skinner, G. B.; Knox, R. The relationship between airborne bacteria and organisms recovered from children in a burns unit. *Guy's Hospital Reports* 107:69-85, 1958. (6 refs).

Detailed studies conducted over a 6 months period with respect to air sampling (open plate and slit sampler) of the burn ward and comparison with wound flora and with samples from the adjacent corridor. Staph pyogenes was the commonest pathogen, followed by pyocyanea. Both air and patients carried the same "resident" pathogens. Therapy and ventilation problems are discussed.

44. Price, P. B.; Brown, C. R.; King, T. C.; Peek, R. C., Hunckley, L.
Bacterial invasion in experimental burns. Surg Forum 6-64-7, 1955.

Report of four year study of bacteria flora in small burn wounds in dogs with discovery that severe burns do not sterilize the skin but that remaining bacteria proliferate and may be invasive. Septicemia results only with overwhelming numbers of bacteria carried into the general circulation.

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45. Rabin, E. R.; Graber, C. D.; Vogel, E. H., Jr.; Finkelsstein, R. A., Tumbusch, W. T. Fatal pseudomonas infection in burned patients. A clinical, bacteriologic and anatomic study. New Engl J Med 265:1225-31, 1961. 30 refs

Detailed description of characteristic lesions, symptoms and laboratory findings in pseudomonas infections which occurred terminally in 14 of 38 burn deaths at the Surgical Research Unit, Brooke Army Medical Center.

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46. Schimme., H. The infection of burns Presse Med 69 (2):2309-12, 1961.

Review of bacterial flora from exogenous sources and from wound colonization, discussion of local and general infection.

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47. Simonart, A. Influence of infection on the toxicity of burn edema. Bull Acad Med Belg 2:457-71, 1962.

Sterile edema fluid from 24 hour burns is non-toxic when injected into rabbits. Both pathogenic organisms in physiological solutions and "infected" edema fluid produce the same results as are found in burned animals.

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48. Tumbusch, W. T.; Butkiewicz, J. V. The increase in the gram-negative gram-positive organism ratio in burn deaths associated with septicemia. (U.S. Army Surgical Research Unit, Brooke Army Medical Center, Fort Sam Houston, Texas, Research Report MEDEW-RS-3-59 October 1959) 7 p.

Not reviewed. Article available in National Library of Medicine.

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49. Tumbusch, W. T., and others. Septicemia in burn injury. (U.S. Army Surgical Research Unit, Brooke Army Medical Center, Fort Sam Houston, Texas Research Report MEDEW-RS-6-60 October 1960) 14 p. 14 refs.

Not reviewed. Article available in National Library of Medicine.

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50. Tumbusch, W.T.; Vogel, E.H., Jr.; Butkiewicz, J.V.; Graber, C.D.; Larson, D.L.; Mitchell, E.T., Jr. The rising incidence of *Pseudomonas* septicemia following burn injury. Research in Burns, edited by C.P. Artz, AIBS, Pub No 9, Washington, D.C., 1962

Summary from the Surgical Research Unit, Brooke Army Medical Center of published and unpublished data on *Pseudomonas* septicemia: factors in increasing incidence, signs and symptoms and similarity of clinical course to endotoxemia, status of therapy, as yet ineffective against this complication of extensive burns.

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51. Verder, E.; Rosenthal, S.M. Role of infection in the delayed deaths of mice following extensive burn injury. Proc Soc Exp Biol Med 108:501-5, 1961. 31 refs.

Not reviewed. Available in the National Library of Medicine.

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52. Wald, M. Gangrenous cholecystitis with bile peritonitis as a complication of burns in a 14-year-old boy. Med J Aust 2:553-55, 1961. 5 refs.

Report of unusual complication of burns in a child following development of septicemia.

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IX
HEMATOLOGY
STUDIES

HEMATOLOGY
STUDIES

1. Barac, G. The antidiuretic effect of heating blood in vitro and of burns after heparinization of blood in vitro, in the dog. C.R. Soc. Biol. (Par) 153:857-60, 1959. 6 refs.

Experimental Burns: One of a series of renal studies in the burned dog.

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2. Davies, J. W. L.; Topley, E. The disappearance of red cells in patients with burns. Clin Sc 15:135-48, 1956. 24 refs.

Preliminary study from Birmingham Accident Hospital for material reported in 1960 by Davies.

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3. Davies, J. W. L. A critical evaluation of red cell and plasma volume techniques in patients with burns. J Clin Path 13:105-111, 1960. 5 refs.

Important reference article with detailed techniques of red cell volume determinations in 110 patients at Birmingham Accident Hospital.

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4. Davis, A.K.; Alpen, E.L. Mechanism of erythrocyte destruction in the burned rat. *Amer J Physiol* 184:151-4, 1956. 8 refs.

Measurement of disappearance of Fe 59 tagged red blood cells in normal and burned rats (25%). Mean survival time of 42 days in former, 9 days in latter.

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5. De Hemptinne, A.; Gauthier, P. Destruction of the red cells after burn. *Rev Belg Path* 28:358-64, 1961. 20 refs.

Not reviewed. Available in the National Library of Medicine.

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6. Gilmore, J.P.; Fozzard, H.A. Mechanism of acute erythrocyte loss following burns. *Amer J Physiol* 198:487-90, 1960. 10 refs.

Direct measurement of changes in red cell mass (maximum in 4 hours) and studies of osmotic fragility and plasma hemoglobin in dogs with standardized burns. Report of splenic extrusion of sequestered erythrocytes following initial 13% decrease in red cells. Discussion of related work of others. Advocates colloids other than blood to relieve initial 50% plasma loss.

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7. Ham, T.H., Shen, S.C., Fleming, E.M.; Castle, W.B. Studies on the destruction of red blood cells. IV. Thermal injury, action of heat in causing increased spheroidicity, osmotic and mechanical fragilities and hemolysis of erythrocytes; observations on the mechanisms of destruction of such erythrocytes in dogs and in a patient with a fatal thermal burn. Blood 3:373-403, 1948. 40 refs.

Early important reference article on mechanism of acute erythrocyte loss as a result of changes in osmotic fragility following thermal trauma.

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8. Iida, F.; Richter, H.M.; Shoemaker, W.C. Measurement of rapidly and slowly circulating red cell volumes in thermal injury. Surg Gyn Obstet 114:701, 1962.

Determinations of disappearance rates of Evans blue dye, Cr^{51} labeled red cell equilibration studies, plasma and red cell volume determinations in 20 dogs before and after thermal injury and analysis of results in terms of early or late death of animals.

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9. James, G.W. III.; Abbott, L.D., Jr., Brooks, J.W.; Evans, E.I. The anemia of thermal injury. III. Erythropoiesis and hemoglobin metabolism studies with N^{15} - glycine in dog and man. J Clin Invest 33:150-62, 1954. 35 refs.

Experimental studies in burned dogs (20% contact burns) and a burned man (16% 3rd degree burns) in which evidence of a depression in hemoglobin formation was found, life span of 2 normal dogs' erythrocytes was about 100-104 days while, in the man, life span of the cells formed during injury was approximately 126 days. Other physiological and biochemical data also were gathered.

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10. Johansson, S. A. Heparin and thrombocytopenia in experimental burn injuries. *Acta Physiol Scand* 53:239-46, 1961. 26 refs.

A study with rabbits to determine the effect of pretreatment with heparin on the concentration of 5 hydroxytryptamine and platelets in whole blood following experimental burns. Without pretreatment, it was noted that there was a decrease in the number of circulating platelets and a subsequent decrease of 5-HT following the burn; this did not occur when the rabbits were pretreated with heparin.

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11. Jones, D.M.; Alpen, E.L., Davis, A.K. Acute erythrocyte destruction in severe thermal injury. *Amer J Physiol* 184:147-50, 1956. 8 refs.

Burns equivalent to those which would follow a nuclear explosion were administered to rats and the effects of these flash burns upon the destruction of red cells measured with regard to intensity of irradiation, length of exposure, amount of body area burned, and destruction of normal cells following burning.

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12. Knisely, M.H. Postburn pathologic circulatory physiology. *Research in Burns*, edited by C. P. Artz, AIBS Pub. No. 9, Washington, D. C., 1962.

Reports of animal and human research on the occurrence of sludge in blood circulation following burns, including studies using horizontal microscopes.

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13. Levin, W.C.; Blocker, T.G., Jr. Studies in burn anemia. Annual Report, U.S. Army Contract DA-49-007-MD-447, 1958.

Red cell survival time studies in acute burns and during convalescence indicating correlation to some extent with the severity of lesions.

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14. Lyon, J.L.; Emery, A.J., Jr., Davis, T.P., Pearse, H.E. The relationship of thermally induced hemoglobinemia to volume of skin burn. Surgery 40:234-46, 1956.

Hematologic study in pigs with correlation between plasma hemoglobin levels and known volumes of burned tissue. Table devised for estimation of depth of burn in relation to extent and concentration of plasma hemoglobin in 8%.

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15. McCarthy, M.D.; Amrein, M.B.; Cobb, M.; Neerhout, R.; Blackburn, V. Anemia in relation to survival following thermal injury in the rat. Amer J Physiol 189:6-10, 1957. 12 refs.

Three groups of rats - with 20%, 30% and 50% body surface burns - (along with 3 unburned control groups) were checked for hematocrit and erythrocyte and reticulocyte counts at specific intervals following burning to determine the relationship of postburn anemia to survival and extent of injury.

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16. McCarthy, M. D.; Odell, J. Myelograms relating to anemia and hematopoiesis following thermal injury in rats. *Proc Soc Exp Biol Med* 94:489-93, 1957.

Control rats, bled rats and thermally injured rats (20% and 50% body surface burns) were compared to investigate the quantitative changes in femoral marrow between the groups. Results showed that, in the burned group, a suppressed medullary hematopoiesis occurred and was a contributing factor to circulatory anemia after thermal injury.

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17. McCarthy, M. D.; Darby, M., Oertel, I.; Wiens, C., Atherton, S. Hematocrit depressor and reticulocyte suppressor in extracts of spleens from normal and postburn rats. *Amer J Physiol* 198:911-5, 1960. 5 refs.

Role of spleen in depression of hematocrit and suppression of reticulocytes, more marked following burns than under normal conditions. Hypotheses discussed.

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18. Muir, I. F. K. Red-cell destruction in burns, with particular reference to the shock period. *Brit J Plast Surg* 14:273-302, 1961. 27 refs.

Analysis of pattern of red-cell destruction with emphasis upon individual idiosyncrasies and necessity for whole blood transfusions as indicated by 1) continuing shock with falling hematocrit on plasma therapy, hemoglobinemia or hematuria present a few hours postburn; 2) high fragility rate of red-cells.

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19. Quinby, W. C., Jr., Cope, O. Blood viscosity and the whole blood therapy of burns. *Surgery* 32:316-25, 1952. 27 refs.

Fundamental studies in supportive shock therapy of burns (Massachusetts General Hospital).

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20. Raker, J. W.; Rovit, R. L. The acute red blood cell destruction following severe thermal trauma in dogs. *Surg Gynec Obstet* 98:169-76, 1954. 5 refs.

Hematological Study. Report of red cell destruction in experimental burns (dogs), employing cells tagged with radioactive chromate 8-10% acute loss in relation to total blood volume considered indications for withholding whole blood transfusions for 48 hours.

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21. Saltz, N. J.; Wiznitzer, T.; Czaczkis, W. Red cell destruction following experimental thermal burns. Arch Surg (Chicago) 82:360-5, 1961. 9 refs.

A study to determine the erythrocyte volume on both the venous and arterial sides of the circulation following experimental burns in dogs, which showed an average red cell loss at the 3rd hour postburn of 7% (venous samples) and 29% (arterial samples) with the average loss (based on mean value of both arterial and venous samples) of 18%, approximately twice that of the venous sample by itself.

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22. Salzberg, A.M., Evans, E.I. Blood volumes in normal and burned dogs. Ann Surg 132:746-759, 1950. 13 refs.

Study from the Medical College of Virginia of circulating plasma and red cell volumes (as measured by radio-active phosphorus tagged red cells and T-1824 dye) in control and burned animals with and without splenectomy.

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23. Schwarzbart, G. Mean corpuscular volume of erythrocytes and hematocrit in experimental burns. Surgery 47:594-602, 1960. 16 refs.

Rat experiments on the effect of changes in erythrocyte volume on increase of hematocrit following burns. Results indicated that hematocrit was not an adequate criterion of early intravascular fluid loss and that a possible "increase" of M.C.V. should be considered.

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24. Silvestri, U. Spectrographic research on the composition in trace elements in erythrocytes of healthy and burned individuals. Boll Soc Ital Biol Sper 35:1113-1115, 1959.

Not reviewed. Available in the National Library of Medicine.

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25. Topley, E., Moe, D., Jackson, D. The clinical control of red cell loss in burns. J Clin Path 10:1-19, 1957. 28 refs.

Extensive studies from Birmingham group in 150 clinical subjects. Measurement of red cell volume during each phase of the burn with findings of accumulated losses averaging 185% of the total number under a regimen of occlusive dressing techniques and removal of eschar prior to grafting by sharp dissection.

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26. Topley, E. The use of blood film on admission and of red cell volume studies in the management of the shock stage in extensive burns. Bibl Haemat 7:64-68, 1958.

Method for gauging necessity for blood transfusions by the percentage of microcytes in the film.

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27. Troell, L.; Norlander, O.; Johanson, B. Red cell destruction in burns, with special reference to changes in the endogenous formation of carbon monoxide. *Acta Chir Scand* 109:158-68, 1955.

Study of carbon monoxide-hemoglobin values in expired air in 8 burn patients with findings of daily loss of 15, 2 gm. of hemoglobin. Hb breakdown in body accompanied by endogenous CO formation.

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28. Virenque, J., Gaubert, J., Gaubert, Mme J. Variations of blood eosinophils in operated and burned children. *Presse Med* 67:2173-4, 1959.

Comparison of variations in eosinophil counts in children in relation to surgery and to extensive burns with findings in adult patients.

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29. Weiner, W.; Topley, E. Dohle bodies in the leucocytes of patients with burns. *J Clin Path* 8:324-8, 1955. 11 refs.

Dohle bodies of unknown significance were found in the neutrophil leucocytes of a number of burned patients, most often in patients with large amounts of full-thickness skin loss. The Dohle bodies seemed to appear 1 or 2 days postburn and generally disappeared once skin cover was nearly or completely obtained.

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30. Wight, A.; Raker, J.W.; Merrington, W.R.; Cope, O. The ebb and flood of the eosinophils in the burned patient and their use in the clinical management. *Ann Surg* 137:175-83, 1953. 10 refs.

Study of 31 burned patients in relation to the rise and fall of eosinophil counts; the significance of persistent or recurring eosinopenia and the effects of ACTH and cortisone on the circulating eosinophils also are discussed.

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X

RENAL STUDIES AND THERAPY
OF RENAL COMPLICATIONS

X

RENAL STUDIES AND THERAPY
OF RENAL COMPLICATIONS

1. Barac, G. The nervous system and oliguria of burns in the dog. C R Soc Biol (Par) 151:2214-7, 1957.

One of a series of renal studies in the burned dog.

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2. Barac, G. The effect of sorbitol on oliguria of burns in the dog. C.R. Soc Biol (Par) 153:1624-6, 1959.

Therapy of renal insufficiency in the laboratory animal.

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3. Barac, G. Action of three diuretic sulfonamides on the acute oliguria of burns in the dog. C R Soc Biol (Par) 155:939-41, 1961.

Therapy of renal insufficiency in burned dogs.

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4. Breed, E.S. Some experiences with shock in burns. *Surg Clin N Amer* 39:393-405, 1959. 35 refs.

General article with reports on 12 patients, including renal function studies and discussion of problems associated with fluid therapy.

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5. Chandra, T.; Mehrotra, R.M.L.; Perkash, I. Alkaline phosphatase studies in kidneys in experimental burns and in 5 cases of extensive human burns. *Indian J Med Sci* 15:562-6, 1961. 8 refs.

Not reviewed. Available in the National Library of Medicine.

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6. Dubouloz, P.; Laurent, J.; Fondaral, J.A. Oxygen fixation by kidney sections after burns or frostbite. *C R Soc Biol (Par)* 154:142-4, 1960.

Not reviewed. Available in the National Library of Medicine.

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7. Dudley, H. A. F., Batchelor, A. D. R.; Sutherland, A. B. The management of haemoglobinuria in extensive burns. *Brit J Plast Surg* 7:275-85, 1957. 18 refs.

Treatment of hemoglobinuria and attendant renal dysfunction with mannitol (1 gm/kgm in 5-10 minutes) to induce "solite diuresis."

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8. Goldhahn, W. E. Kidney damage in burns and its treatment with extracorporeal dialysis. *Zbl Chir* 85:1983-8, 1960. 20 refs.

Report of 2 cases of renal insufficiency treated with the artificial kidney.

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9. Graber, L. G.; Sevitt, S. Renal function in burned patients and its relationship to morphological changes. *J Clin Path* 12:25-44, 1959. 51 refs.

Study in renal pathology in 17 cases, indicating glomerular defects in acute failure in addition to tubular necrosis and casts.

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10. Hasselbacher, K. Renal complications following burns. *Med Welt* 1 (13):654-6, 1961. 5 refs.

Not reviewed. Available in the National Library of Medicine.

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11. Jorgensen, H. E. Osmotic diuresis in the treatment of acute burns. Ugeskr Laeg 122:824-6, 1960. 11 refs.

Not reviewed. Available in the National Library of Medicine.

12. Matter, P., Blocker, T. G., Jr. Experimental evaluation of oliguria and edema in burns with the use of urca. A preliminary report. Annual Report, Army Contract DA-49-007-MD-447, 1961.

Renal function studies in relation to the use of osmotic diuretics such as urea and the carbohydrate crystalloids.

13. Mirabet, V., Mallent, J. Urea as a diuretic in burns. Experimental treatment. Med Esp 44:100-4, 1960.

Experimental work to evaluate diuretic effect of 20% urea given intravenously in dogs with serious severe burns.

14. . Moors, F. D. Solute diuresis as a therapeutic aspect in burn physiology, in Research in Burns, edited by C. P. Artz, AIBS, Pub No 9, Washington, D. C., 1962.

Report of experiences with dextran (60% in isotonic saline) as a substitute for plasma in fluid replacement therapy and discussion of methods of promoting solute diuresis. Mannitol considered the most effective agent for this purpose.

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15. Schlegel, J. U.; Jorgensen, H. Studies in metabolism of trauma. II. Treatment of burns. Ann Surg 149:252-66, 1959. 26 refs.

Report of studies with 4% urea solution following thermal trauma.

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16. Schlegel, J. U.; Moon, K. H. Osmotic diuresis and renal blood flow. Research in Burns, edited by C. P. Artz, AIBS, Pub No 9, Washington, D. C., 1962.

Report of renal plasma flow (PAH clearance) studies in overhydrated dogs, employing 0.9% sodium chloride, 5% dextrose in water and 4% urea in 5% dextrose in water.

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17. Sevitt, S. Distal tubular and proximal tubular necrosis in the kidneys of burned patients. *J Clin Path* 9:279-94, 1956. 26 refs.

Histologic analysis of the kidneys of 86 burned patients with finding of proximal tubular necrosis in 17, chiefly in elderly patients with oliguria and nephrosclerosis, and distal necrosis in 34, mainly children with or without associated oliguria. Focal changes in 18 children were not considered important.

XI

OTHER COMPLICATIONS

XI
OTHER
COMPLICATIONS

1. Allan, C.M.; Cullen, W.C.; Gillies, D.M.M. Ventricular fibrillation in a burned boy. Canad Med Assn. J 85:432-4, 1961. 12 refs.

Complications of Burns. Case Report.

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2. Allegra, F. Behavior of some specific indices of disease during the burn syndrome. G Ital Derm 100:48-64, 1959. 34 refs.

Not reviewed. Available in the National
Library of Medicine.

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3. Arney, G.K., Pearson, E.; Sutherland, A.B. Burn stress pseudodiabetes. Ann Surg 152:77-90, 1960. 32 refs.

Endocrine: Use of insulin in two patients with
pseudodiabetes. Article by Army Surgical
Research Unit Staff at Brooke Army Medical
Center.

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4. Baar, S. The development of an acquired haemoglobin abnormality caused by thermal injury. *J Clin Path* 13:112-7, 1960. 10 refs.

Complications-Hematology. Case reports of 16 patients.

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5. Bergentz, S. E. Studies on the genesis of post-traumatic fat embolism. *Acta Chir Scand Suppl* 282:5-72, 1961. 136 refs.

Studies indicate that following injury the physical state of the blood changes so that fat droplets are formed from blood in vitro. The clinical symptoms ascribed to fat emboli are believed to be caused by unpaired flow due to red cell aggregation.

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6. Bothe, F. A., Magee, R. B. Multiple Curling's ulcer involving the esophagus, stomach and duodenum. *Pennsylvania Med J* 56:642-4, 1953.

Complications-Hemorrhagic. Case reports.

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7. Boyd, B. M., Jr.; Roberts, W. M.; Miller, G. R. Perarticular ossification following burns. *South Med J* 52:1048-51, 1959. 6 refs.

Complications of Burns. Six Case Reports.

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8. Brescia, M. A., and others. Thermal vaccinatum. Report of a case of smallpox vaccination complicated by a burn. Arch Pediat 79:55-7, 1962.

Case Report.

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9. Buffat, J. D. Gastro-intestinal ulcers and severe cutaneous burns. Praxis (Switzerland) 49:408-9, 1960. 6 refs.

Complications-Hemorrhagic. Case Reports.

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10. Carrie, C. On the prevention of keloid formation. Hautarzt 12:82-5, 1961. 8 refs.

Not reviewed. Available in the National Library of Medicine.

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11. Colson, P. Osteoporosis after severe burns. Acta Chir Belg Suppl 1:509-13, 1956.

Complications - Bone and Joint changes noted in clinical subjects.

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12. Connell, J. F., Jr. Successful Therapy in Patients with Pulmonary Burns, in *Research in Burns*, edited by C. P. Artz, AIBS, Pub No 9, Washington, D. C., 1962.

Fifty patients with respiratory lesions treated by therapy described in this paper, which included immediate tracheotomy followed by the use of enzyme aerosols and by suctioning at regular intervals to keep the bronchial passages open. Some success was noted with patients with pulmonary burns of the upper respiratory tree, but if the burns were in the lower tree, they were generally fatal.

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13. Detmold, J. Serious damage to the brain after burning. *Aerztl Wschr* 10:831-3, 1955.

Not reviewed. Available in the National Library of Medicine.

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14. Evans, E. B.; Smith, J. R. Bone and joint changes following burns. *J Bone and Joint Surgery* 41-A:785-799, 1959. 9 refs.

Classification and description of bone and joint changes associated with extensive burns (six-year study). This work has led to the incorporation of a well-outlined physiotherapy program at the University of Texas Burns Service, which takes into account preventive as well as therapeutic measures.

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15. Evans, E. B.; Blumel, J. Bone and joint changes following burns, in *Research in Burns*, edited by C. P. Artz, AIBS, Pub No 9, Washington, D. C., 1962

Summary of alterations noted in more comprehensive article in 1959 with classification according to roentgen studies in 725 burn patients (University of Texas Medical Branch).

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16. Ferola, R. Osseous changes in burned patients. *Acta Chir Ital* 16:389-404, 1961.

Not reviewed. Available in the National Library of Medicine.

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17. Feune de Columbi, G.; Benaim, F. Latent venous insufficiency in the sequelae of burns of the lower extremities. *Sem Med (B Air)* 117:656-8, 1960.

Not reviewed. Available in the National Library of Medicine.

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18. Freitas Neto, A. G. de. Acute duodenal ulcer after a burn. Curling's ulcer. Rev Assn Med Bras 5:343-7, 1959. 13 refs.

A case study of a patient with 35% external burns who had a Curling's ulcer (duodenal). The patient died 13 days after the burn.

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19. Horton, C. E.; Crawford, H. H.; Love, H. G.; Loeffler, R. A. The malignant potential of burn scar. Plast Reconstr Surg 22:345-53, 1958. 14 refs.

Indicated treatment of burn cancers as in other malignancies, i. e. wide surgical excision with regional node dissection if needed. Prognosis of burn scar cancer is not as good as the prognosis of skin cancer in general. Since burn cancers generally do not occur in areas that have been grafted, a preventive measure is early grafting and, following initial healing, secondary correction for scarring. Seven case reports are cited as representative of malignancy changes found in burn scars.

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20. Hummel, R. P.; Lanchantin, G. F.; Artz, C. P. Clinical Experiences and Studies in Curling's Ulcer. JAMA 164:141-146, 1957. 16 refs.

Report of 2% incidence of Curling's ulcer in series of 1,000 patients at Brooke Army Medical Center with recommendation of antacids for prophylaxis.

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21. Huschke, U. Brain damage after burns. *Mschr Kinderhk* 104:300-7, 1956. 5 cases. 50 refs.

Not reviewed. Available in the National Library of Medicine.

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22. Laborit, H.; Weber, B. Hepatic insufficiency in severe burns. *Lyon Chir* 55:687-700, 1959. 22 refs.

Results of clinical findings on hepatic insufficiency related to severe burns discussed in the light of physio-pathological mechanisms. Indications are that hepatic insufficiency may be improved by salts of potassium, magnesium and aspartic acid.

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23. Lasserre, I., and others. Hemorrhagic ulcer of the duodenum in a little girl burned over 25 percent of the body surface; gastrectomy recovery. *Bordeaux Chir* 1:33-5, 1960.

Not reviewed. Available in the National Library of Medicine.

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24. Leitner, J. J. Perforated gastric ulcer associated with external burns. *Gastroenterology* 24:109-12, 1953. 6 refs.

A case report is presented of a perforated gastric ulcer associated with severe burns (2nd degree, 45% body surface).

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25. Levenson, S.M., Crowley, L.V.; Oates, J.F.; Glinos, A.O. Effect of severe burn on liver regeneration. *Surg Forum* 9:493-500, 1958. 5 tables. 6 refs.

Three experiments on normal and burned rats to study the rate of liver regeneration were reported. Following 70% hepatectomies, liver regeneration was rapid and equal in both control and burned rats. Following 35% hepatectomies, regeneration was greater in the burned rats. Discussion of experimental results relative to present theories of "metabolic reaction to injuries" and to factors that control liver growth and regeneration.

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26. Lindlar, F., Berger, H. Marked increase in amino acids and fatty degeneration of the liver, after severe burns. *Schweiz Med Wschr* 92:110-2, 1962. 3 refs.

Case report on a 6-year-old girl who died 4 months after severe burns. In a biochemical analysis, the free amino acid content of the fatty liver was found to be about 10 times as high as normal.

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27. Millesi, H. A case of extensive burn complicated by an open fracture. *Klin Med Wien* 15:212-20, 1960.

Not reviewed. Available in the National Library of Medicine.

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28. Moncrief, J. A. Complications of burns. *Ann Surg* 147:443, 1958.

Complications of acute burns outlined in a review of 1,000 patients at the Surgical Research Unit of Brooke Army Hospital. These include circulatory, renal, cardiac, hemorrhagic, and infectious complications in addition to the special problems posed by location of burn lesions, i.e. ears, hands, bone, tendon, and joint involvement, and the eye. Electrical burns, also discussed along with chemical thermal trauma.

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29. Moncrief, J. A. Femoral catheters. *Ann Surg* 147:166-72, 1958.

Comprehensive discussion of complications with use of intravenous femoral polyethylene catheters based on experience at the Surgical Research Unit. Warning against routine use because of the dangers of septic thrombophlebitis.

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30. Moncrief, J. A. Tracheotomy in burns. *AMA Arch Surg* 79:45-8, 1959.

Emphasis on indications for tracheotomy in patients with respiratory involvement and face burns. Discussion of use of tracheal oxygen mist as an adjunct to therapy.

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31. Mousseau, M., Mabey, P., Magne, J., Lebeaupin, R., Guimbratene, J. Fatal fibrinolysis following excision of a severe burn. *J. Chir (Paris)* 84 361-6 1952.

Not reviewed. Available in the National Library of Medicine.

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32. Nelson, T. G., Pillsbury, R. D., Bowers, W. F. The use of tracheotomy in the burned patient. *Surg Gynec Obstet* 104:163-6, 1957. 3 refs.

Report from Brooke Army Medical Center on 64 tracheotomies in 1060 patients. Indications and complications.

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33. Okman, L., and others. Acute duodenal ulcer in children with burn injuries. Nord Med 66:1233-6, 1961.

Not reviewed. Available in the National Library of Medicine.

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34. Pessiercau, G.; Vigne, J.; Monteilet, R., Francfort. Coagulation and thromboembolic complications in 234 burned patients. Presse Med 69:1019-22, 1961. 18 refs.

Not reviewed. Available in the National Library of Medicine.

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35. Scatafossi, S. The complications of burns. Policlinico (Prat) 68:837-41, 1961.

Not reviewed. Available in the National Library of Medicine.

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36. Sevitt, S.; Gallagher, N. Venous thrombosis and pulmonary embolism. A clinico-pathological study in injured and burned patients. *Brit J Surg* 48:475-89, 1961. 24 refs.

Extensive post-mortem studies in patients dying from burns or other trauma. Relation of incidence to age, survival period (bed rest) and prolongation of life by therapy.

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37. Steiss, C.F.; Maloney, S.F.; Harper, H.A. Complications in the modern treatment of severe burns. *Plast Reconstr Surg* 16:31-6, 1955. 3 refs.

Discussion of complications in general with warning against cortisone Rx because of interference with evaluation of sodium balance.

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38. Stepanek, V.; Doieček, R. The skeletal changes in burned patients. *Radiol Clin (Basel)* 29:82-94, 1960. 28 refs.

Review of the literature and report on roentgenograms in 40 severe burns of whom 8 demonstrated osteoporosis as a non-specific sequela of thermal trauma. Discussion of etiology.

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39. Torraca, L. Fatal hemorrhage due to duodenal ulcer in a patient with burns. *G Ital Chir* 8:1-7, 1952. 13 refs.

Not reviewed. Available in the National Library of Medicine.

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40. Vlasov, V. V.; Khotenovskii, K. A. Diseases of the skin in burn patients. *Vestn Derm Vener* 36:31-4, 1962. (Rus.)

Not reviewed. Available in the National Library of Medicine.

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41. Wagner, H. J. The detection and reaction of lipochromic substances in the lungs before and after burns by histochemical and paper chromatographic research. *Deutsch Z Ges Gerichtl Med* 49:130-46, 1959.

Not reviewed. Available in the National Library of Medicine.

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42. Weidenmann, W. Internal hemorrhage of a 9-month-old infant after 2nd degree burns. *Zbl Chir* 85:1833-9, 1960.

Not reviewed. Available in the National Library of Medicine.

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43. Weigel, A.E.; Artz, C.P.; Reiss, E.; Davis, J.H.; Amspacher, W.H. Gastrointestinal ulcerations complicating burns. A report of five cases and review of seventeen cases reported from 1942 to 1952. *Surgery* 34:826-36, 1953. 24 refs.

Discussion of 22 cases of gastrointestinal ulceration associated with burns, including a review of 17 cases reported in the literature from 1942 to 1952 and 5 additional case studies from the authors' experience.

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XII
BURN PATHOPHYSIOLOGY
AND
EXPERIMENTAL RESEARCH

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1) GENERAL CIRCULATORY AND CARDIOVASCULAR CHANGES

1. Birke, G., Liljedahl, S.O.; Linderholm, H. Studies on burns.
4. On the possibility of prolonged use of an indwelling cardiac catheter in the pulmonary artery for studies of circulation and for intravenous infusion. Acta Chir Scand 116:362-9, 1958/59. 4 refs.

Detailed case reports in 8 burn patients (considered 20%-100% mortality risks) in whom cardiac catheterization techniques were employed for therapeutic and investigative purposes.

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2. Birke, G.; Liljedahl, S.O.; Linderholm, H. Studies on burns.
5. Clinical and patho-physiological aspects on circulation and respiration. Acta Chir Scand 116:370-94, 1958/59. 35 refs.

Report of studies with cardiac catheterization techniques in 8 burn patients. Therapeutic agents (e.g. blood, oxygen, potassium, digitalis) discussed in relation to circulatory and pulmonary pathophysiology.

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3. Delarue, J.; Mignot, J.; Simard, C.L. On the circulatory changes observed after experimental burns. Bull Acad Nat Med (Par) 144:200-3, 1960.

Not reviewed. Available in the National Library of Medicine.

4. Dobson, E. L.; Warner, G. F. Factors concerned in the early stages of thermal shock. Circulat Res 5:69-74, 1957. 19 refs.

Measurement of cardiac output, plasma volume, liver blood flow and other circulatory parameters in experimental burns in dogs. Immediate, marked, sustained depression in cardiac output (little change in mean arterial pressure) with plasma volume reduction following circulatory depression. Indications of increased turnover of plasma proteins.

5. Fozzard, H. A., and others. Treatment of severe thermal burns with digoxin and intravenous fluids. U.S. Naval Medical Field Research Laboratory Camp Lejeune, North Carolina (Report) 9, 1959. 12 p. 21 refs.

Not reviewed. Available in the National Library of Medicine.

6. Fozzard, H. A. Myocardial injury in burn shock. *Ann Surg* 154:113-19, 1961. 28 refs.

Report of dog experiments in which cardiac output decreased to approximately one-half following a severe standardized burn and blood volume expansion alone was found insufficient to restore normal levels. The beneficial effects of rapid digitalization in combination with fluid therapy were demonstrated, and the possibility efficacy of digitalis therapy in clinical burn shock was suggested.

7. Fozzard, H. A. Myocardial injury in burn shock, in *Research in Burns*, edited by C. P. Artz, AIBS, Pub No 9, Washington, D. C., 1962.

Studies on myocardial involvement in burn shock as a concomitant of decreased cardiac output. Improvement on therapeutic trial with digitalis.

8. Gilmore, J. P. Cardiovascular changes of the burned dog following the infusion of intravenous solution. *Amer J Physiol* 190:513-16, 1957. 9 refs.

Various methods of measuring cardiac output and plasma volume made to study the effects of intravenous infusion during burn shock, e.g. dextrose-saline, dextran, plasma and gelatin, or cardiovascular responses of burned dogs.

9. Calmore, J. P.; Fozzard, H. A. Acute blood volume changes following flash burn. U.S. Naval Medical Field Research Laboratory, Camp Lejeune, North Carolina, 8, 1958. 12 p. 11 refs.

Not reviewed. Available in the National Library of Medicine.

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10. Hardy, J. D.; Neely, W.; Wilson, F. C., Jr.; Lovelace, J.; Jabbour, R. E. Thermal burns in man. V. Cardiac output during early therapy. Surg Gynec Obstet 101:94-8, 1955. 7 refs.

Report of initially normal or decreased cardiac output followed by higher levels after several days of treatment.

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11. Merriam, T. W., Jr. Myocardial function following thermal injury. Circ Res 11:669-73, 1962.

Studies of myocardial function in dogs following standardized (30%) burns. A reduction of myocardial contractility was demonstrated; this alteration was significantly less evident in a group of control dogs, who received similar "manipulation" but were not actually burned.

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2) HEPATIC FUNCTION

1. Bensim, F.; Pattin, M.; Rapaport, M. Biopsy puncture of the liver in critical burns. Research in Burns, edited by C. P. Artz, AIBS, Pub No 9, Washington, D. C., 1962.

Organic changes in the liver obtained through biopsy studies in severely injured patients.
Data from the Institute of Burns, Plastic and Reconstructive Surgery in Buenos Aires.

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2. Dobson, E. L. The role of the liver circulation in fluid and electrolyte balance. Research in Burns, edited by C. P. Artz, AIBS, Pub No 9, Washington, D. C., 1962. 21 refs.

Data presented from dog experiments to support the theory that body fluid homeostasis is maintained by blood levels of hormones controlling salt and water excretion which are altered by changes in liver plasma flow.

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3. Gilmore, J. P., Fozzard, H. A. Hepatic function following thermal injury. Fed Proc 17:53, 1958.

Experimental and clinical investigation of liver function, which was found to occur within a few hours after injury, with slow recovery over a period of several weeks.

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4. Gilmore, J. P.; Fozzard, H. A. Liver function following thermal injury. *Amer J Physiol* 198:491-495, 1960. 16 refs

Studies with Rose Bengal, [^{131}] and uric acid to determine relative splanchnic oxygen consumption in dogs with a 30% burn. Data indicate that hepatic hypoxia does not contribute to the production of early hepatic injury following severe thermal trauma.

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5. Kliachkin, L. M. Clinical pathology of the internal organs in burn sickness. *Klin Med* 40:26-33, 1962.

Not reviewed. Available in National Library of Medicine.

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6. Moyson, F., Schreim-Dourmont, A. Concentration of nucleic acid in cytoplasmic fractions of liver after experimental burns *Ann Chir Plast* 6:117-21, 1961. 17 refs.

Not reviewed. Available in National Library of Medicine.

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7. Stenberg, T.; Hogeman, K. E. Experimental and clinical investigations on liver function in burns. Research in Burns, edited by C. P. Artz, AIBS, Pub No 9, Washington, D. C., 1962.

Impaired liver function has been found to occur within a few hours after injury, with slow recovery in patients over a period of several weeks.

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3) ACTH AND CORTISONE THERAPY AND STUDIES ON ADRENAL FUNCTION

1. Amoudru, C. Severe burns treated with ACTH. *Sem Med(Paris)* 28:54-8, 1952.

Two case reports employing use of ACTH in extensive burns.

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2. Antonini, R.; Arezio, G. Phosphatase activity of the adrenal glands; the adrenals in burn stress. *Minerva Chir* 11:289-95, 1956. 7 refs.

Not reviewed. Available in the National Library of Medicine.

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3. Antonini, R.; Brittinger, G.; Lungarotti, F.; Silini, G. The residual adrenal gland in stress caused by burns; histochemical study. *Minerva Chir* 12:1479-86, 1957. 32 refs.

Not reviewed. Available in the National Library of Medicine.

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4. Bergonzelli, V.; Orecchia, C. The effect of pituitary adrenocorticotrophic hormone (ACTH) in the treatment of experimental shock caused by burns. *Minerva Chir* 10:983-90, 1955. 60 refs.

Report of beneficial results in 40 experimental
burns treated with injections of ACTH.

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5. Chandra, T.; Perkash, I. Histological changes in adrenals in 108 experimental animals in extensive burns. *Indian J Med Sci* 15:558-66, 1961. 8 refs.

Not reviewed. Available in the National Library
of Medicine.

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6. DeRepetto, D.S.; Schneerson, D.; Diza, P. Three stages in the study of adrenal function in burned patients. *Sem Med (B Air)* 117:654-6, 1960.

Discussion of burn pathophysiology in relation to
stress and adrenal function.

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7. Duncan, J. T., Jr. Adrenal insufficiency in thermal burn with septicemia. *Amer Surg* 20:57-9, 1954. 9 refs.

Case report of adrenal failure in a severe burn.

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8. Feller, I. A second look at adrenal cortical function in burn stress. Research in Burns, edited by C. P. Artz, AIBS, Pub No 9, Washington, D. C., 1962.

Evaluation of adrenal function in relation to burn severity and to therapy, with note of marked differences between fatal and surviving burn cases and an occasional instance of adrenal insufficiency following acute thermal trauma.

9. Goodall, McC., Stone, C.; Haynes, B. W., Jr. Urinary output of adrenaline and noradrenaline in severe thermal burns. Ann Surg 145:479-87, 1957. 74 refs.

Study of levels in urine of adrenaline and noradrenaline which were found to be generally elevated in relation to severity of lesions and to persist after initial period. Exception: instances of acute adrenal medullary insufficiency in some fatal cases.

10. Goodall, McC.; Haynes, B. W., Jr. Adrenal medullary insufficiency in thermal burns. Surg Forum 10:251-4, 1959. 14 refs.

A report on 12 fatal burn patients with possible adrenal medullary insufficiency. At time of death, eight of these showed subnormal adrenaline output and subnormal adrenaline content of the adrenal gland.

11. Goodall, McC.; Haynes, B. W., Jr. Adrenal medullary insufficiency in severe thermal burn. *J Clin Invest* 39:1927-32, 1960. 47 refs.

Not reviewed. Available in the National Library of Medicine.

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12. Goodall, McC. Adrenaline and noradrenaline in thermal burns. *Research in Burns*, edited by C. P. Artz, AIBS, Pub No 9, Washington, D. C., 1962.

Endocrine studies in burns on adrenaline and noradrenaline excretion, including details of techniques and results in 20 normal adult males, 30 burn patients who survived and 14 fatal burns. In non-fatal cases there was an immediate rise in urinary output and elevation excretion levels persisted for 2 to 12 weeks with gradual return to normal. Most of the fatal burns showed a high output initially with terminal sub-normal levels, probably due to inherent failure of the adrenal medulla.

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13. Hume, D. M.; Nelson, D. H., Miller, D. W. Blood and urinary 17-hydroxycorticosteroids in patients with severe burns. *Ann Surg* 143:316-29, 1956. 10 refs.

Endocrine studies in 26 patients (including 2 fatal ones) in the Bennington aircraft carrier fire. Measurement of urinary and blood 17-hydroxycorticosteroid levels over a prolonged period without evidence of adrenal failure. Increased activity as long as 16-17th day, then return to normal. Normal response to ACTH administration and to trauma. The 2 fatal cases had received cortisone and ACTH and had high levels at death.

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14. McCarthy, M. D.; Blackburn, V. Effect of adrenocorticotrophic and adrenocortical hormones on ten day survival following severe thermal injury in the rat. *Ann Surg* 142:76-81, 1955. 10 refs.

A study with rats with 50% back burns to determine the effects of a range of dosages and administration intervals of adrenocorticotrophic and adrenocortical hormones on survival 10 days postburn, no significant increase in survival was noted.

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15. Mandelstam, P., and others. Acute adrenal cortical insufficiency and persistent occult dysfunction following thermal injury. U.S. Army Surgical Research Unit, Brooke Army Medical Center, Ft. Sam Houston, Texas Research Report MEDEW-RS-1-58, 1958. 19 p. 39 refs.

Not reviewed. Available in the National Library of Medicine.

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16. Markley, K., Bocanegra, M., Ego-Aguirre, E., Chiaporri, M., Morales, G. Adrenocortical function after major surgical operations and thermal trauma in man. *Surgery* 47:389-98, 1960. 23 refs.

Clinical experiments to determine the increase of adrenocortical activity following trauma and to determine if this activity is at its height directly following trauma. Two types of trauma were studied: major surgical operations (29 patients) and burns (44 patients with 10 to 50% body surface burns). Results indicated adrenal activity was greater following thermal trauma than following surgical trauma.

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17. Martin, J. D., Jr., McGarity, W. C.; Smith, F. C. Evaluation of ACTH and cortisone in the treatment of burns. *Surgery* 38:543-52, 1955. 13 refs.

Experiences in 22 severely burned patients with conclusion that ACTH and cortisone should not be used routinely but that there was no serious objections to use of these agents.

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18. Monsaingeon, A.; Fouys, H.; Couturier, S. Delayed edema in a burned patient. *Presse Med* 67:1505-7, 1959. 19 refs.

Description of a case in which at 3 months post-burn there occurred massive edema following sodium depletion. Hyperaldosterone effect was believed responsible. Urinary ketosteroid patterns are included.

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19. Neal, W. B., Jr.; Woodward, E. R.; Kark, A. E.; Zubiran, J. M.; Montalbet, J. A. Effect of ACTH, cortisone and DOCA on survival of burned rat. *AMA Arch Surg* 65:774-82, 1952.

A series of 13 experiments on rats to study the effects of corticotropin, cortisone and desoxycorticosterone acetate on treatment of experimental burns.

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20. Pierce, G. W.; Klabunde, E. H. Experiences with ACTH in treatment of burns. *Plast Reconstr Surg* 12:265-8, 1953. 5 refs.

Not reviewed. Available in the National Library of Medicine.

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21. Rennels, E., Timmer, R. F. The effect of scalding on plasma levels of corticosterone in the rat. Research in Burns, edited by C. P. Artz, AIBS, Pub No 9, Washington, D. C., 1964.

Studies of corticosterone plasma levels in the rat following scalding in comparison with normal controls.

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22. Schottler, W.H.A. On the therapeutic value of ACTH and cortisone in experimental burns. *Endocrinology* 57:445-9, 1955. 14 refs.

Experiments in 600 white mice (including controls) to determine the effects of ACTH, cortisone and a mixture of the 2 hormones on postburn mortality rates. Results showed no beneficial effects from the hormones, and, in fact, mortality was enhanced by cortisone treatment.

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23. Sevitt, S. Adrenocortical function in burned patients; with special reference to ACTH and adrenaline tests. *Brit Med J* 1:541-6, 1954. 20 refs.

Study of 54 burned patients with regard to adrenocortical activity (based on spontaneous changes in eosinophil count following burning) and in 21 patients on changes brought about by test doses of ACTH or adrenaline. Results confirmed previous findings that, following severe burns, there is always adrenocortical hyperactivity; no subsequent adrenocortical failure was noted in 49 of the 54 patients.

24. Shulman, M. H.; Fulton, G. P.; Morant, G. R. Effect of cortisone on the healing of localized burns in the hamster cheek pouch. *New Engl J Med* 251:257-61, 1954. 8 refs.

Report of deleterious effects of cortisone therapy on localized burns. Avascularity, delayed healing and infection noted whereas control lesions were well in 6 days.

25. Trusler, H. M.; Glanz, S.; Bauer, T. B. An evaluation of pituitary adrenocorticotrophic hormone (ACTH) in the treatment of severe burns; relationship to skin grafting. *Plast Reconstr Surg* 9:478-90, 1952. 16 refs.

Not reviewed. Available in the National Library of Medicine.

26. Wight, A.; Weisman, P.A.; Rovit, R.L.; Cope, O. Adrenal hormones and increased capillary permeability of burns. An experimental evaluation. *AMA Arch Surg* 65:309-17, 1952.

Report of animal experiments to determine the effect of treatment with cortisone or corticotropin on the abnormal capillary permeability which follows burns. No evidence was found that either hormone influenced capillary permeability. The authors concluded that the results did not confirm the current (1952) theory that "these hormones are plasma and fluid spacers in the burned patient."

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27. Wilson, H., Lovelace, J.R.; Hardy, J.D. The adrenocortical response to extensive burns in man. *Ann Surg* 141:175-84, 1955. 9 refs.

Case studies in 12 severely burned patients. Results indicated that following extensive burns, excretion of corticoids was elevated markedly, but that excretion of 17-ketosteroids (though sometimes increased initially) declined in severe chronic burns; a poor prognosis was felt to be indicated when there was a "prolonged severe depression of the total eosinophil count" after burn injury.

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4. METABOLISM AND NUTRITION STUDIES

1. Arturson, G. Serum proteins and protein-bound carbohydrates in burned rats. *Acta Chir Scand* 120:309-17, 1961. '22 refs'.

Biochemistry and Metabolism of Burns. Article
by Swedish authority in Burn Research.

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2. Benaim, F.; De Repetto, D.S. Influence of dressings, anesthesia and transfusions on the nitrogen balance of burned patients. *Sem Med (B Air)* 117:761-2, 1960.

Review of effects of therapy on metabolic status,
based upon experience at Institute of Burns,
Plastic and Reconstructive Surgery in Buenos
Aires.

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3. Birke, G., Liljedahl, S.O., Plantin, L.O., Wetterfors, J. Albumin catabolism in burns and following surgical procedures. *Acta Chir Scand* 118:353-66, 1959/1960. 19 refs.

Fifty patients were studied in an investigation of the elimination and catabolism of albumin from the blood following severe burns (24 patients) and surgical operations (16 patients) (10 controls). I ¹³¹ labeled albumin was used in the study.

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4. Blocker, T.G., Jr., Washburn, W.W.; Levin, W.C.; Nowinski, W.W.; Lewis, S.R., Blocker, V. Nutrition studies in the severely burned. Ann Surg 141:589-97, 1955. 3 refs.

Report of fundamental studies in protein metabolism with radioactive compounds and summary of clinical results with high-protein forced feeding.

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5. Blocker, T.G., Jr.; Lewis, S.R.; Levin, W.C.; Perry, J., Blocker, Virginia. The problem of protein disequilibrium following severe thermal trauma. Research in Burns, edited by Curtis P. Artz, AIBS, Pub No 9, Washington, D.C., 1962.

Summary of basic metabolic studies with tagged compounds and other methods.

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6. Braasch, J.W., and others. Metabolism of carbon-14-methyl labeled sodium acetate following thermal trauma in the rat. U.S. Army Medical Nutrition Laboratory, Denver. Report no. 169, 29 July 55. 14 p.

Not reviewed. Available in National Library of Medicine.

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7. Brown, S.O. Burn healing in albino rats and mice fed diets deficient in certain vitamins, in Research in Burns, edited by C.P. Artz, AIBS, Pub No 9, Washington, D.C., 1962.

A series of animal (mice and albino rats) experiments to investigate the effect that diets deficient in certain vitamins and essentially fatty acids have on burn healing.

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8. Brown, S.O.; Sorg, V.; Jones, J.T. Burn healing in rats maintained on diets containing different levels of pyridoxine. Tex Rep Biol Med 20:562-9, 1962.

Review of literature and observation of wound healing following experimental burns in rats fed on varying percentages of normal requirements of pyridoxine. The completely deficient group failed to show normal healing. Rats fed on 100% pyridoxine level showed slower healing than those at 5% and 25% levels.

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9. Caldwell, F.T., Jr. Metabolic response to thermal trauma. II. Nutritional studies with rats at two environmental temperatures. Ann Surg 155:119-26, 1962. 5 refs.

Report of differences in weight and mortality between burned rats maintained at 30°C and 20°C. The latter lose weight, have sustained negative nitrogen balance and show higher mortality on fixed diets (at pre-burn level), but improve if allowed free access to food. Eschar separation and wound healing are more rapid at 20°C.

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10. Davies, J.W.; Ricketts, C.R.; Bull, J.P. Studies of plasma protein metabolism. I. Albumin in burned and injured patients. Clin Sci 23:411-23, 1962.

Basic studies of albumin metabolism employing tagging with ^{131} in burns and other trauma to study relation of albumin to general changes in protein metabolism.

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11. Doleček, R., Kalina, J. Anabolic hormones in the treatment of burns. Acta Chir Plast (Praha) 4(3):214-26, 1962.

Report of clinical improvement in 23 burn patients following administration of Dianabol and Durabolin and effects of exogenous aldosterone in one patient.

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12. Emery, C.E., Jr., Rosen, H.; Levenson, S.M. Effect of thermal injury on ascorbic acid and tyrosine metabolism. Proc Soc Exp Biol Med 106 267-70, 1961. 13 refs.

Experimental studies in guinea pigs with standardized burns to observe pattern of injury as it involves Vitamin C. Confirmation of previous observations of altered metabolism and increased need for ascorbic acid after injury.

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13. Goston, B.H. Observations on the use of intravenous fat in burned patients. (U.S. Army Surgical Research Unit, Brooke Army Medical Center, Fort Sam Houston, Texas Research Report MEDEW-RS-11-57) 14 p. 17 refs.

Not reviewed. Available in National Library of Medicine.

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14. Harper H. A. Nutritional aspects of the care of the burned patient. *Plast Reconstr Surg* 21 389-92, 1958. 11 refs.

Summary of nutrition program in care of extensive burns, employing tube feedings, supplementary vitamins, etc. Recommendation of 50-80 calories and 2-3 gm of protein per kg.

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15. Levenson, S.M.; Lounds, E.A.; Morris, Rosalyn. Oral fat emulsion in the feeding of patients with severe burns. *Ann NY Acad Sci* 56:37-45, 1952.

Use of Lipomul in supplementary feedings for clinical patients.

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16. Levenson, S.M.; Crowley, L.V.; Rosen, H.; Vincour, H.M. Effect of administered ascorbic acid on the metabolic response to thermal trauma. *Proc Soc Exp Biol Med* 90:502-4, 1955, 13 refs.

An unsuccessful attempt to verify previous reports of decrease in nitrogen excretion in traumatized rats following administration of supplemental ascorbic acid to animals with severe thermal injury.

17. Levenson, S.M.; Watkin, D.M. Protein requirements in injury and certain acute and chronic diseases. *Federation Proceedings* 18:1155-1190, 1959. 219 refs

Comprehensive review of the literature with regard to metabolic and nutritional changes associated with injury and certain acute and chronic diseases, and a discussion of mechanisms involved.

18. Levenson, S.M.; Einheber, A.; Malm, O.J. Nutritional and metabolic aspects of shock. *Federation Proceedings, Supplement* 9:99-119, 1961.

Review of the nutritional and metabolic aspects of shock. See 1959 reference.

19. Pearson, E. ; Sorooff, H. S. ; Reiss, E. Metabolic derangements in burns. J Amer Diet Assn 32:223-8, 1956.

Balance data in a composite patient and averages of 6 patients in metabolic studies at the Surgical Research Unit, Brooke Army Medical Center.

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20. Pearson, E. , Sorooff, H. S. ; Prudden, J. F. ; Schwartz, M. S. Studies on growth hormone: V. Effect on the mineral and nitrogen balances of burned patients. Amer J Med Sci 239:17-26, 1960. 11 refs.

Study of effect of pituitary growth hormone administration to 4 clinical subjects at the Army Surgical Research Unit. Retention of potassium, calcium, sodium, and chloride was observed above critical levels which approximated "ad lib" levels of administration. No effect was noted upon magnesium and phosphorus balance. Highest positive nitrogen balance was observed in patient studied late in convalescence.

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21. Pearson, E. ; Sorooff, H. S. ; Arney, G. K. , Artz, C. P. An estimation of the potassium requirements for equilibrium in burned patients. Surg Gynec Obstet 112:263-73, 1961. 5 refs.

Study of 11 patients during four 10-day periods at the Army Surgical Research Unit. Ratios presented for K:N during various phases of response.

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22. Pelissier, G. Oral administration of supplementary diet to surgical patients; first favorable results in a patient with burns. *Afr Fran Chir* 13:449-51, 1955.

Report of continuous forced feeding regimen in a burn patient with indwelling catheter and use of milk-based formula with added vitamins and minerals.

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23. Prudden, J. F.; Pearson, E., Soroff, H. S. Studies on growth hormone. II. The effect of growth hormone on the nitrogen metabolism of severely burned patients. *Surg Gynec Obstet* 102:695-701, 1956. 8 refs.

Study of four severely burned patients to determine the effect of growth hormone upon metabolic balance, with definite effect on the nitrogen balance being noted in the data analysis.

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24. Reiss, E., Pearson, E.; Artz, C. P. The metabolic response to burns. *J Clin Invest* 35:62-77, 1956. 16 refs.

Nitrogen and mineral balance studies (60-180 days) in 5 burn patients at the Army Surgical Research Unit. Details of technique included.

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25. Soroff, H. S. ; Pearson, E. ; Green, N. L. ; & Artz, C. P. The Effect of Growth Hormone on Nitrogen Balance at Various Levels of Intake in Burned Patients. Surg Gynec Obstet 111:259-273, 1960. 18 refs .

Observations following administration of pituitary growth hormone to burn patients at the Army Surgical Research Unit.

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26. Soroff, H. S. ; Pearson, E. ; Artz, C. P. An estimation of the nitrogen requirements for equilibrium in burned patients. Surg Gynec Obstet 112:159-72, 1961.

Metabolic studies in 11 burn patients at the Army Surgical Research Unit. See Summary in Soroff et al, 1962.

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27. Soroff, H. S. ; Pearson, E. ; Arney, G. K. ; Artz, C. P. Metabolism of burned patients; an estimation of the nitrogen and potassium requirements, in Research in Burns, edited by C. P. Artz, AIBS Pub No 9, Washington, D. C., 1962.

Study of 11 male burn patients and 11 controls with statistical analysis of the nitrogen and potassium requirements for equilibrium in burned patients.

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28. Spandonari, A.; Repetto Carboneschi, W. Correlation between the thyroid gland and the burn syndrome. Effect of Thyroxine and total gland extracts. Arch Sci Med 102:576-84, 1956. 9 refs.

Not reviewed. Available in National Library of Medicine.

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29. Sutherland, A. B. The nutritional care of the burned patient. Brit J Plast Surg 8:68-74, 1955. 2 refs.

Outline of forced feeding regimen with formulas for use of protein hydrolysates as supplements to the diet and for tube feeding.

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30. Troell, L., Wretling, A. Protein and caloric requirements in burns. Acta Chir Scand 122:15-20, 1961. 8 refs.

Nitrogen and caloric balance study of 13 burn patients at Karolinska Institute (Stockholm). At least 1.2 gm of protein/kg were required with caloric intake at 40-60 calories/kg and increases mandatory for external protein loss. Tube feeding formula included.

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31. Ungar, G.; Damgaard, E. Protein breakdown in the thermal injury. *Proc Soc Exp Biol Med* 87:378-83, 1954. 17 refs.

Study in skin slices subjected to thermal trauma in vitro. Results suggest that an inactive enzyme precursor present in normal tissue is converted by heat damage to an active protease.

32. Webb, W.R.; Doyle, R.S.; Howard, H.S. Relative Metabolic Effects of Calories, Protein and an Anabolic Hormone. (19-~~nor~~-Testosterone) in Early Postoperative Period, *Metabolism* 9:1047-1057, 1960. 21 refs.

Not reviewed. Available in the National Library of Medicine.

33. Zimmermann, B. Nutrition and body fluids, shock, and burns. *Surg Gynec Obstet* 114:228-32, 1962.

Review of work of Rabelo, Clark and Kinsey on total energy expenditure in 2 burn cases; of Malin and Slawikowski on convalescent serum studies in rats, of De Jesus et al on immediate excision of standardized flame burns in rats; and of Foreman on influence of occlusive therapy on wound healing.

5. METABOLIC RATE AND EFFECTS OF TEMPERATURE

1. Berberian, G.M. Temporary regional surface cooling and long term heparinization in the therapy of burns. *Surgery* 43:391-2, 1960. '4 refs.

Report of clinical study in 40 patients with 5%-20% burns (36 of 2nd degree) treated with repeated applications of cold packs combined with long-term heparinization.

2. Caldwell, F. T., Jr.; Osterholm, J. L., Sower, N. D.; Moyer, C. A. Metabolic response to thermal trauma of normal and thyroidectomized rats at three environmental temperatures. *Ann Surg* 150:976-88, 1957. 10 refs.

Metabolic studies in burned normal and thyroidectomized rats at 24°, 28°, and 32°C. The hypermetabolic state appears not to be related to the thyroid gland but to be secondary to increased vaporizational heat loss through the wound. The catabolic phase in burns may be ameliorated by regulation of the environmental temperature.

3. Caldwell, F. T., Jr. The role of the thyroid gland in the production of the hypermetabolic state occurring in rats with full-thickness burns. *Endocrinology* 67:363-7, 1960. 4 refs.

Study of thyroid I^{131} uptake levels in burned rats with conclusion that the burned rat is capable of increased oxygen consumption (thus, heat production) with normal or subnormal levels of thyroid activity. The thyroid modulates response but does not control it.

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4. Caldwell, F. T., Jr. The effect of early eschar excision upon the nutritional state and rate of wound closure of rats with full-thickness thermal burns. *Surgery* 49:454-60, 1961. 8 refs.

Demonstration of dynamic relationship between a surface wound and the external environment which alters the energy balance. Whichever factors produce the least total obligatory vaporizational heat loss place the least total nutritional demand upon the injured animal.

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5. Carboneschi, W. R.; Spandonari, A. Burn Syndrome and its modification by thyroidectomy. *Arch Sci Med* 102:594-606, 1956. 16 refs.

Not reviewed. Available in the National Library of Medicine.

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6. Cope, O.; Nardi, G. L.; Quijano, M.; Rovit, R. L.; Stanbury, J. B.; Wight, A. Metabolic rate and thyroid function following acute thermal trauma in man. *Ann Surg* 137:165-174, 1953. 18 refs.

Inquiry into etiology of elevated basal metabolic rates with conclusion that correlation exists between extent and severity of burn rather than with fever or hyperactivity of thyroid.

7. De Cosse, J. J. The effect of hypothermia and infection in rats. U.S. Army Surgical Research Unit, Brooke Army Medical Center, Fort Sam Houston, Texas Research Report MEDEW-RS-7-58, 1958. 8 p. 9 refs.

Not reviewed. Available in the National Library of Medicine.

8. Ferrer, J. M., Jr.; Crikelair, J. F.; Armstrong, D. Some effects of cooling on scald burns in the rat. *Surg Forum* 13:486-7, 1962.

Production of hypothermia following tail burns by immersion and following generalized burns of general hypothermia in air. Enhanced wound healing effect from cold in local burns and some protective value of low temperatures noted in generalized burns to correlate with seasonal variations of mortality rate of control animals.

9. King, T.C.; Zimmerman, J.M.; Price, P.B. Effect of immediate short-term cooling on extensive burns. Surg Forum 13:487-8, 1962.

Conclusion from experiments in 16 animals following 50% scalds that cooled animals suffered less severe systemic injury than control group.

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10. Lieberman, Z.H.; Lansche, J.M. Effects of thermal injury on metabolic rate and insensible water loss in the rat. Surg Forum 7:83-8, 1956. 4 refs.

Study of vaporization heat loss through burned skin eschar, and open wounds and effect of coverage with a water-impermeable dressing (Saran wrap).

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11. Martin, J.D., Jr.; Stone, H.H.; Cooper, F.W., Jr. The utilization of hypothermia in early burn therapy. Surgery 43:258-65, 1958. 25 refs.

Hypothermia with drugs and/or cold packs and for treatment of burns in the acute phase in experimental animals (dogs).

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12. Micali, G.; Mirabella, A.; Cacciola, R. Prolonged artificial sleep in the treatment of experimental burns Minerva Chir 15:1052-6, 1960. 39 refs.

Experimental studies in dogs with analysis of local wound during sleep therapy.

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13. Moncrief, J. A.; Mason, A. D., Jr. Water vapor loss in the burned patient. Surg Forum 13:38-41, 1962.

Clinical studies indicating evaporative water loss 20 x normal in early phase post burn, decreasing as healing occurs. Respiratory loss is minimized with 100% humidification in tracheotomy cases.

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14. Moore, D. H.; Worf, D. L. Effect of temperature on the transfer of serum proteins into tissues injured by tourniquet and by scald. Amer J Physiol 170:616-23, 1952. 27 refs.

Beneficial effects of cooling in dog limb burns related to reduction of capillary circulation and filtration and a reduction of enzymatic action. Exudates had a lower protein concentration and extracts from muscle and skin were reduced in quantity and concentration.

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15. Moyer, C. The metabolism of burned animals and its relationship to vaporizational heat loss and other parameters. Research in Burns, edited by C. P. Artz, AIBS, Pub No 9, Washington, D. C., 1962.

Effects of vaporizational heat loss through burn eschars and open wounds in production of hyper-metabolism. Use of warm saline baths in the early period and eventual skin coverage to combat this catabolic stimulus.

16. Rabelo, A.; Clark, R. G.; Kinney, J. M. Energy expenditure in two severely burned patients. Surg Forum 12:462-4, 1961.

Metabolic study of a fatal 45% burn patient (surviving 16 days) and an 85% burn patient (surviving 4 days). 160% increase in daily caloric expenditure in 45% burn for first 10 days, followed by decrease. The overwhelming burn had hypothermia and showed early, progressive metabolic deterioration.

17. Shulman, A. G.; Wagner, K. Effect of cold water immersion on burn edema in rabbits. Surg Gyn Obst 115:557-60, 1962.

Effect of cold in reduction of local wound edema in experimental burns.

18. Stone, H.H.; Martin, J.D., Jr. Studies in hypothermia and its use in early burn therapy. *Surg Forum* 9:58-61, 1958. 2 refs.

Experiments with hypothermia in the burned dog through exposure to cold air and ice bath immersion. Transient deceleration of edema fluid noted along with other favorable effects, but prolonged hypothermia was deleterious from standpoint of inhibition of respiratory center, alteration in renal tubular function and depression of reticulo-endothelial system.

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19. Zitowitz, L.; Hardy, J.D. Influence of cold exposure on thermal burns in the rat. *J Appl Physiol* 12:147-54, 1958. 15 refs.

Studies indicating progressive tissue damage in mild burns for several days, accompanied by persistent pain, which may be influenced by immediate cooling for a short period of time. Delay of cooling had an inverse effect. Results in more severe burns were not spectacular, although others have reported prolonged survival. Technical difficulties due to variability in skin and hair growth are discussed.

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6) LOCAL BURN WOUND STUDIES

1. Allgower, M., Pomerat, C.M.; Blocker, T.G., Jr. Influence of normal serum, its derivatives, and of "wound-healing agents" on human epidermis in vitro. Ann Surg 135:923-937, 1952. 49 refs.

Important experimental study demonstrating that wound healing agents act by irritation which produces serum exudation which in turn exerts a beneficial effect.

2. Allison, F., Jr.; Smith, M.K., Wood, W.B., Jr. Studies on the Pathogenesis of Acute Inflammation. II. The Action of Cortisone on the Inflammatory Response to Thermal Injury. J Exp Med 102:669, 1955.

Microscopic study of response to thermal injury in rabbit ear chamber (demonstrating that inflammatory exudation of leucocytes and phenomenon of "leucocyte sticking" to vessel walls are less intense in animals receiving cortisone). Belief that increased susceptibility to bacterial infections after cortisone is due in part to this anti-inflammatory action.

3. Arposio, M., Panella, A. Observations on healing processes of burns with applications of cold water (experimental research) Riv Pat Clin 16:674-94, 1961.

Not reviewed. Available in National Library of Medicine.

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4. Axelrod, A.E.; Martin, D.J. Biochemical changes in thermally-injured cutaneous tissue, susceptibility to proteolytic enzymes, and extractability of collagen. Proc Soc Exp Biol Med 83:463-7, 1953. 12 refs.

Preliminary studies of susceptibility of burned skin of rats to peptic and tryptic digestion. (Also changes in collagen of rat skin and tail tendon - more extractable by normal saline. Action of trypsin increases with heating.

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5. Bailey, B.N.; Lewis, S.R.; Blocker, T.G., Jr. Standardization of experimental burns in the laboratory rat, Tex Reports on Biol and Med 20:20-25, 1962. (7 refs).

Description of original apparatus (the "Bailey Burner") and discussion of technique for inflicting standardized scalds in the laboratory rat. University of Texas Medical Branch

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6. Ballani, G.K., Jha, C.D.; Sanyal, R.K. Histamine and 5-hydroxytryptamine after cutaneous burn in mice and rats. *J Phar Pharmacol* 11:512, 1959.

Experimental burns in mice and rats, analyzing histamine and 5-hydroxytryptamine at 10 min., 2 hrs., and 24 hrc. in skin, subcutaneous tissue, spleen, and lung with no increase found over normal values, contrary to work of Dekanski (1951).

7. Böhler, J.; Strehl, R. Differential diagnosis of 3rd degree burns by intravenous vital staining. *Langenbeck Arch Klin Chir* 297:504-14, 1961. 16 refs.

Clinical studies of dye methods for early diagnosis of depth of involvement.

8. Calapaj, G. Novoviocin and experimental burns. *Riv Pat Clin* 13:14-22, 1958.

Not reviewed. Available in the National Library of Medicine.

9. Califano, A. First research on the antumitotic activity of the aqueous extract of eschar from burns Boll Soc Ital Biol Sper 38:57-60, 1962.

Not reviewed. Available in National Library of Medicine.

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10. Conn, J.H., Fain, W.R.; Ferrington, E. A simple, accurate method for early differentiation of partial and full-thickness burns. Surg Forum 11:287-9, 1960.

Animal experiment (dogs and pigs) to determine a method for early differentiation between partial and full thickness burns. Direct sky blue dye which has an affinity for the lymphatic system, was injected into the burned skin: in a partial thickness burn, there was a centrifugal lymphatic spread of the dye, with no uptake noted in the full-thickness burn area.

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11. Cruickshank, C.N.D.; Hershey, F.B. The effect of heat on the metabolism of guinea pig's ear skin. Ann Surg 151:419-30, 1960. 14 refs.

In vitro and in vivo studies of burned skin for determination of effect of heat on oxygen consumption and enzyme activity. Important fundamental investigation.

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12. De Jesus, R. S.; Fox, C. L., Jr., Ferrer, J. M., Humphreys, G. H. Standardized flame burns in mice, fluid and electrolyte shifts and effects of cross transplantation of normal and burned skin. *Surg Forum* 12:458-60, 1961. 4 refs.

Study of the influence of fluid therapy (moderately effective) and surgical excision (ineffective) in experimental burns in mice.

13. Delarue, J., Mignot, J.; Sumard, C. Experimental burns of the cheek pouches in the golden hamster, study of the vascular changes. *C R Soc Biol (Par)* 153:535-7, 1959.

Not reviewed. Available in the National Library of Medicine.

14. Vergzinc, M. The theoretical and practical significance of the subdivision of the second degree burn into a superficial and deep type. *Research in Burns*, edited by C. P. Arta, AIBS, Pub No 9, Washington, D. C., 1962.

Discussion of differences between superficial (IIa) and deep (IIb) second degree burns with emphasis on local pathology and dynamic biological changes.

15. Donohue, P.; Caldwell, F. T., Jr. Effect of eschar excision upon the rate of contraction of full-thickness thermal burns. *J Surg Research* 2:67-8, 1962. 3 refs.

Study in 57 albino rats to determine the rate of closure of wounds of equivalent sizes made by skin excision and full thickness burns, and to determine if the rate of burn healing is significantly affected by eschar excision and wound base protection.

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16. Eade, G. G. The relationship between granulation tissue, bacteria and skin grafts in burned patients. *Plast Reconstr Surg* 22:42-55, 1958. 7 refs.

Studies of bacterial cultures of granulations prior to and following application of skin grafts and observation that rapid destruction of pathogens takes place once coverage is obtained over a mechanically clean surface. Histological and tissue culture preparations carried out in collaboration with Pomerat have demonstrated the remarkable mitotic activity of granulation tissue. The question of whether or not to remove granulations partially by slicing through exuberant tissue was also studied with conclusion that flattening occurred automatically with elevation of involved parts and with skin coverage.

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17. Edlund, T.; Juhlin, L. Studies on the permeability of connective tissue. I. The Effects of dibenamine on the decreased dermal spread caused by intra-auricular burns, corticotropine, posterior pituitary extract, adrenaline and noradrenaline. *Acta Pharmacol. (Kbh)* 10:390-400, 1954. 32 refs.

Not reviewed. Available in the National Library of Medicine.

18. Farmer, A.W., Franks, W.R., Young, D.M., Maxmen, M., Chasmar, L.R. Effect of early excision of experimental burns. *Brit J Plast Surg* 7:289-302, 1955. 12 refs.

Experimental studies in mice. Excision of a standardized scald prior to 2 hours resulted in reduction in mortality, thereafter, it was harmful. Measurements were made of fluid in burned area and of excretion of intraperitoneal saline.

19. Gunnel, N.S., Kapetansky, D.I., Weissman, F., Pinkus, H.K.B. A study of epithelialization in blistered burns. Local treatment. *AMA Arch Surg* 74 90f 3, 1957. 6 refs.

Outline of technique for studying epithelialization of burns in clinical subjects and results indicating that superficial blistered burns epithelialize about 40% more rapidly when blisters left intact.

20. Gimbel, H. S., Threlkeld, R.; Farris, W. Epithelization in experimental burn blisters, in Research in Burns, edited by C. P. Artz, AIBS Pub No 9, Washington, D. C., 1962.

Summary of previous study and report of influence of a number of topical agents, all without effect except royal jelly from the bee, which appears to enhance epithelization. Discussion of findings on mitosis counts.

21. Hershey, Falls B. Effects of heat on the enzymes of skin. in Research in Burns, edited by Curtis P. Artz, AIBS Pub No 9, Washington, D. C., 1962.

Report of the effect on the enzymes of the skin as measured in homogenates of human epidermis and the ear skin of guinea pigs. Inactivation of certain enzymes in the metabolic cycles of injured tissue was noted in terms of decreased oxygen consumption, glucose utilization, lactic acid production and succinic dehydrogenase activity.

22. Hunshaw, J. R., Pearse, H. E. Histologic techniques for the differential staining of burned and normal tissues. Surg Gyn and Obstet 103:726-730, 1956. 6 refs.

Detailed outlines of staining techniques for determining the depth of experimental burns. Modification of Verhoeff's elastic tissue stain most useful for general work.

23. Hinshaw, J. R. An experimental study of the degeneration and regeneration of nerve fibers following a burn. Surg Gyn Obstet 103:31, 1956.

Study in rabbits indicating that neural injury may be delayed following injury for as long as 2-3 days and that although regeneration of isolated new branches begins about the 4th day, complete regeneration requires 4-7 weeks.

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24. Hinshaw, J. R. An experimental study of the degeneration and regeneration of nerve fibers following a burn. Surg Gyn Obstet 103:31-7, 1956. 4 refs.

Investigation of nerve degeneration and regeneration following radiant heat injury in rabbits. Emphasis on possibility of delayed degeneration and on slow but delayed regeneration (4-7 weeks).

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25. King, T. C.; Reynolds, L. E., Price, P. E. Local edema and capillary permeability associated with burn wounds. Surg Forum 6:80-4, 1955. 10 refs.

Study of changes in capillary permeability following various types of thermal injury in dogs with dye techniques. Influence of pressure and cold.

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26. King, T.C.; Price, P.B. The early differentiation of full thickness burns. Surg Forum 11:285-7, 1960. 4 refs.

Animal experiment to test the feasibility of using dyes to predict the areas of complete tissue death in burn wounds. One hundred experimental burns were observed in dogs using Evans blue dye in injections to determine areas where capillary leakage of stained proteins did not appear, indicating devitalized tissue which could be subjected to early excision.

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27. Kirov, A.A. Restoration of the various qualities of sensation and types of nerve endings in free skin grafts after extensive burns. Acta Chir Plast 4 (3):240-5, 1962.

Clinical and histological studies in grafts of process of vascularization, of regeneration of nerve endings and of restoration of tactile, pain, and temperature perception.

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28. Klein, L., Curtiss, P.H., Jr.; Davis, J.H. Collagen breakdown in thermal burns. Surg Forum 13:459-61, 1962.

Study in 3 burn patients on a gelatin-free diet. Following thermal injury high levels of urinary OH P (hydroxyproline) reflect the proteolytic breakdown of denatured dermal collagen.

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29. Levenson, S.M.; Upjohn, H.L.; Preston, J.A., Steer, A., Effect of thermal burns on the wound healing. Ann Surg 146:357-368, 1957. 19 refs.

Studies indicating that the pattern of wound healing following thermal injury in the guinea pig possesses the same characteristics as observed in unburned scorbutic animals unless large prophylactic doses of ascorbic acid are administered.

30. Meese, E.H.; Wels, P.B.; Postoloff, A.V. Evaluation of neomycin hydrocortisone ointment in the open treatment of experimental thermal burns; development of apparatus for producing standard burns. Surg 46:1069-77, 1959. 13 refs.

Topical agents employed in treatment of partial-thickness burns in the rabbit; preliminary study.

31. Monsaingeon, A.; Tanret, P. Tripeptidasic activity during the course of cutaneous burns. Research in Burns, edited by C.P. Artz, AIBS, Pub No 9, Washington, D.C., 1962.

Description of technique for measuring quantitative changes in tripeptidasic activity of the plasma in relation to cutaneous burns in patients and in experimental animals. Attempts to define by histochemical techniques the onset, site and conditions of enzyme activation in the local wound.

32. Nowinski, W.W.; Ohkubo, T.; Blocker, T.G., Jr. The role of energy production and energy requirements in the process of wound healing by granulation. U.S. Navy Contract 1598(05), Annual Report, 1961,

Experimental studies indicating that abnormal carbohydrate pathways are utilized in the metabolic activity of granulation tissue.

33. Nylen, B.; Wallenius, G. The protein loss via exudation from burns and granulating wound surfaces. Acta Chir Scand 122 97-100, 1961. 10 refs.

Quantitative and qualitative analysis of protein content of wound exudate; average loss in 30% burn wound 85-90 gm. of protein with range between 20 and 200 gm. A/g ratio lower than serum.

34. Payne, J.T.; Krauel, K. Lymphatic lipid alterations in thermal injury. Surg Forum 5:750-3, 1954. 7 refs.

Analysis of lymph from the dog limb following experimental burns indicating a significant increase in lipid content in addition to an increase in lymph volume.

35. Payne, J. T.; Krauel, K. Local lipid shifts in burns. *Surgery* 38:105-12, 1955. 10 refs.

Study in experimental animal (the pig) of lipids and phospho-lipids in burned and normal skin. Decrease in burned areas with finding of lipid in blebs between epidermis and dermis in mild burns. Following immersion burn of dog paw rapid outflow of lipid, largely phospho-lipid, in the lymph.

36. Pomerat, C. M. Tissue culture, Summary, in *Research in Burns*, edited by C. P. Artz, AIBS, Pub No 9, Washington, D. C., 1962.

A summary of current research in cytology related to burns, including references to the role of electrolytes, the effect of cold and heat on cells, cell populations, the effects of gases on cells, the use of cell cultures in radiobiology, etc.

37. Price, P. B.; Call, D. E., Hansen, F. L.; Zerwick, C. J. Histopathologic changes in experimental thermal wounds. *Surgery* 36:664-74, 1954. 1 ref.

Histopathologic evidence from experimental burns that progressive cellular destruction and reparative processes are competitive and proceed concurrently, with the latter beginning at 24 hours. Injuries from steam and flame are more severe than from gasoline explosion flash burns. Burned epidermis was found to be an effective barrier against bacterial invasion.

38. Rensburg, L. C. van. An experimental study of chemical burns. *S. Afr Med J* 36:754-9, 1962.

Results of experimental studies and recommendation that first aid consist of continuous wiping off of chemical until copious flushing with water can be accomplished. Rapidity of treatment more important than "fancy neutralizers."

39. Rosenthal, S. R.; F. R. Hunter; F. J. Finamore, I. N. Roman. On an in vivo method of collection of diffusates from skin. Thermal and radiation injury. *Arch Int Pharmacodyn* 126:43-55, 1960. (7 refs).

An in vivo method with dorsal air pockets for obtaining large quantities of diffusible material from burned or irradiated skin, for assay purposes, circumventing the circulation.

40. Rosenthal, S. R. Basket technique for producing standard thermal injury in mice. *J Trauma* 1:560-70, 1961. (4 refs).

Use of stainless steel basket apparatus for producing standardized back burns in mice.

41. Sevt, S. Inflammatory Changes in Burned Skin. *Acta Chir Plast* 3(1):11-21, 1961. 8 refs.

Experimental studies with Evans blue and vital red dye in controlled guinea pig burns to observe types of capillary permeability stasis and edema and their interrelation. Late permeability and edema changes may be produced by chemical products which form in burned skin or exudate.

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42. Spector, W. G.; Willoughby, D. A. Experimental suppression of increased capillary permeability in thermal burns in rats. *Nature (Lond)* 182:949-50, 1958. 4 refs.

Results consistent with the hypothesis that delayed increased capillary permeability seen after injury is due to consecutive operation of 2 or more intermediary mechanisms or chemical mediators released from the tissues. Release of histamine may be responsible for initial phase.

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43. Spector, W. G.; Willoughby, D. A. Experimental suppression of the acute inflammatory changes of the thermal injury. *J Path Bact* 78:121-32, 1959. 28 refs.

Attempts in the laboratory animal (the rat) to produce suppression with a variety of agents of endogenous mechanisms responsible for increased capillary permeability in burns, as measured by leakage of circulating protein-bound dye and edema formation. In mild burns endogenous mechanisms appear responsible for increased capillary permeability. In more severe burn injury direct injury plays an added role.

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44. Spector, W.G.; Willoughby, D.A. Local treatment of experimental burns with monoamine oxidase inhibitor. *Nature (Lond)* 189:489-90, 1961. 4 refs.

Effect of topical application of a monoamine oxidase inhibitor in a small group of burned rats: inflammatory edema was markedly decreased, whereas previous experiments with systemic administration had shown little influence. Conclusion that release and destruction of an adrenaline-like substance is a local phenomenon.

45. Washburn, W.W., Jr., Blocker, T.G., Jr. The histochemistry of burned human skin. Glycogen, ribonucleic acid and deoxyribonucleic acid. *Plast Reconstr Surg* 12:393-402, 1954. 29 refs.

Histochemistry studies in 33 burn patients in comparison with normal controls. An increase in glycogen was noted first in the tip of migrating epithelium and later in large quantities as piling up of epithelium occurred at the margins of the wound. There was a rapid rise in RNA concentration in the mitotically active layers of the skin, and a greater concentration of the DNA content of nuclei in rapidly dividing cells at the wound edge, particularly in cells of the basal layer.

46. Watson, D.E.; Schloerb, P.R., Darrow, D.C. Carbon dioxide loss from burned skin. *Surg Form* 10:355-6, 1959.

Carbon dioxide diffusion studies in patients. Individual variations related to age of burn. Normal and 3rd degree lesions failed to lose CO₂.

47. Wilhelm, D. L.; Mason, B. Vascular permeability changes in inflammation; the role of endogenous permeability factors in mild thermal injury. Brit J Exp Path 41:487-506, 1960. 42 refs.

Investigation of the pattern of inflammatory reaction in mild experimental burns in guinea pigs, rats and rabbits and division of response into two aspects
1) immediate, mediated by histamine and abolished by low concentrations of local or systemic anti-histamine; 2) and delayed, which is unaffected by substances which are strong in vitro antagonists of the flobulin permeability factor.

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48. Wolfe, J. J., Noland, J. L., Cavanah, H. S. The effect of hydrostatic pressure on the burn injury in rabbits. Surg Gyn Obstet 115:621-5, 1962.

Effect of 10 inches of hydrostatic pressure from a saline solution on edema accumulation in experimental burns in rabbits which were sacrificed at 4 hours. Weight of tissue without pressure increased 119%, with pressure increase was 43%. Discussion of tub apparatus design for immersion of burn patients in 10 inches of Ringer's solution as soon as possible after injury.

7) TOXIN - ANTITOXIN STUDIES

1. Albright, J. F., Berry, E. R. The immune system in thermal injury; burned skin as a source of antigenic substances. Surg Forum 11:289-291, 1960. 4 refs.

Guinea pig tests to explore the possibility that an "immunological phenomenon" is one of the contributing events to injury and death following burns.

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2. Allgower, M., and others. Experimental observations on burn toxins. Ann Chir Plast 6:203-9, 1961, English summary, 9 refs.

Not reviewed. Available in the National Library of Medicine.

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3. Atherton, S., Merrill, N., McCarthy, M. D. Evidence of a lethal auto-immune response in severely burned rats. Fed Proc 17:195, 1960.

Correlation of positive Coombs tests with mortality in Wistar rats receiving 32% scalds at 90°C for 35 seconds.

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4. Bailey, B.N. Experimental observations on immune burn serum.
Brit J Plast Surg 14:243-53, 1961. 15 refs.

Preliminary investigative work conducted on a
project at the University of Texas Medical
Branch. See Matter et al.

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5. Chaet, A. B. Demonstration of burn toxins in invertebrates in
Research in Burns, edited by C.P. Arts, AIBS Pub No 9,
Washington, D.C., 1962.

A series of experiments in which marine invertebrates were scalded and their coelomic fluids tested in various ways to investigate the theory of a toxic burn factor.

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6. Charolanza, E.; Postiglione, G. Immuno-transfusions in the
treatment of burns. Rass Ist Clin Ter 41:871-7, 1961.

Not reviewed. Available in National Library of
Medicine.

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7. Dobrkevsky, M.; Dolezalova, J.; Pavkova, L. Immunological and biochemical changes in burns. Research in Burns, edited by C. P. Artz, AIBS Bull No. 9, Washington, D. C., 1962.

Report from the Burns Unit at Prague on antibody titer levels in the serum of burned patients, employing skin antigens, as measured by colloidal particle agglutination technique.

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8. Feodorov, N. A.; Skurkovich, S. V. Experimental research on immuno-therapy in burns. Khirurgiya 9:48-54, 1955.

In vivo evidence of specific antigens produced from skin injured by thermal trauma and for the development of burn toxin antibodies as an auto-immunization phenomenon. Antigen characterized as being a thrombin-like material, heat-labile, incapable of passing through a Seltz Filter and not species-specific.

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9. Feodorov, N. A.; Skurkovich, S. V. The treatment of burns with the serum of a patient convalescent from burns. Acta Haemat (Basel) 24:163-8, 1960.

Summary of laboratory data with regard to auto-antigens in burned skin of animals and techniques employed in clinical use of convalescent burn serum.

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10. Feodorov, N.A.; Skurkovich, S.V. Immunohemotherapy of burn sickness in *Research in Burns*, edited by C.P. Artz, AIBS Pub No. 9, Washington, D.C., 1962.

Summary article in English of animal and clinical studies at the Central Institute of Hematology and Blood Transfusion in Moscow with regard to autoantigens in the blood and skin of burned subjects. The development of circulating antibodies and the effects of "immune" blood and serum on early burn toxicity.

11. Godfraind, T. The toxicity of peptides in the rabbit. *Arch. Intern. Pharmacodyn* 121:329, 1959.

Summary of work with Simonart, advancing the hypothesis that the pathological changes in acute burns are related to increased protease activity.

12. Graber, C.D. Summary of investigations conducted at U.S. Army Surg Res Unit, concerning the presence of a toxic antigen in the blood of the recently burned organism and the formation of antitoxin antibodies thereto and studies on an antibody against *Pseudomonas*. Immunotransfusion in the treatment of burns, Proceedings of Subcommittee on Plasma. Natl Academy of Sciences-National Research Council, 1961.

Studies on toxin-antitoxin with failure to confirm the HeLa cell cytotoxicity test of Rosenthal except in the presence of hemolysis or exposure of specimens to sunlight.

13. Hunter, F.R.; Rosenthal, S.R.; Hunter, A.S.; Finamore, F.J.; Roman, L.N. Pathogenesis of death due to burns. Materials released from the burned skin of rats. Fed Proc 14:77, 1955.

Animal study of diffusates from burned skin of rats: diffusates containing 10-12 mg. protein/gm. body wt. when injected into 30-50 gm. rats caused death in 2-5 hours, similar amounts of 0.9% NaCl or hemoglobin caused no deaths in 24 hours.

14. Immunotransfusion in the Treatment of Burns, Subcommittee on Plasma, The National Academy of Sciences, National Research Council, 1961.

Report of working committee with summaries of existing clinical and laboratory published and unpublished data. Conclusion that at present there is no evidence as to whether or not convalescent serum, blood or plasma surpass other methods of treatment of acute burns to a statistically reliable degree and suggestion that the benefits of such therapy might be related to antibodies against antigens of bacterial origin rather than to specific substances produced in heat-damaged tissues, including elements of the blood.

15. Ishibashi, Y. Auto-immunization in burns. Nippon Rinsho 20:34-8, 1962.

Not reviewed. Available in National Library of Medicine.

16. Koriakina, L.K., and others. Study, with the aid of the tissue culture method, of toxic and antitoxic properties of the serum of dogs, after thermal burns. Pat Fiziol Eksp Ter 4:56-7, 1960.

Not reviewed. Available in National Library of Medicine.

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17. Kuznetsova, N.I.; Skurkovich, S.V. Auto-antibodies in burns. Pat Fiziol Eksp Ter 3 57-60, 1959.

Not reviewed. Available in National Library of Medicine.

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18. Lasker, S.E.; Fox, C.L., Jr. Effect of polysaccharide derived from bacteria (endotoxin) or from tissues on scalded mice. Fed Proc 18:87, 1959.

Study on mice to determine the part played by exogenous or endogenous polysaccharide in burn shock.

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19. Macgovern, G.J.; Harrison, C.S. The effect of thermal trauma on antibody formation in rabbits. Amer Surg 23:257-63, 1957. 5 refs.

Report that iodinated bovin gamma globulin injected into normal and burned rabbits showed no difference in effect.

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20. Malm, O. J., Slawikowski, G. J. M. An evaluation of the burn toxin-antitoxin theory, with emphasis on experimental methods. Monograph, Office of the Surgeon General, U. S. A., 1961.

Unpublished studies of Malm indicating that careful documentation on convalescent burn serum is lacking, and that animal research chiefly with rats, has been disappointing in view of the fact that when laboratory conditions are optimum and barbiturates are avoided as anesthetic agents it is impossible to achieve a high enough standard mortality level against which to evaluate the efficacy of convalescent serum during the early critical period. This study includes an extensive bibliography.

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21. Malm, O. J., Slawikowski, G. J. M. Mortality, after severe experimental burns, of rats treated with chloromycetin and with sera of rats convalescing from burns or from open wounds. Surg Forum 12:36-8, 1961. 2 refs.

Two animal (rat) experiments on the use of burn convalescent serum and/or chloromycetin in reduction of mortality following burns.

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22. Malm, O. J. Summary - Burn toxins and Convalescent Serum. Summary in Research in Burns, edited by C. P. Artz, AIBS, Pub No 9, Washington, D. C., 1962.

A general review of current research on burn toxins and convalescent serum and a brief history of theory and research in this area dating from 1893.

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23. Matter, P.; Chamber, K., Bailey, B., Lewis, S.R., Blocker, T.G., Jr., Blocker, V. Experimental studies with reference to antigen-antibody phenomena following severe extensive burns. *Ann Surg* 157:725-737, 1963.

Summary of present status of the burn toxin problem with report o. *in vivo* and *in vitro* studies at the University of Texas, Medical Branch.

24. Miller, L. F. Comments regarding immunotransfusion in the treatment of burns, Appendix G., Immunotransfusion in the treatment of burns, Subcommittee on Plasma, Natl. Acad. of Sciences, Natl. Res. Coun., Div. of Medical Sciences, 1961.

Report on a controlled double blind study of a large number of specimens in 1961 with inability to duplicate Rosenthal's results with HeLa cell cultures except when there was hemolysis of specimens or when there had been exposure to sunlight. Miller states that no positive conclusions can be drawn from the work conducted in his laboratory at the time of the Chicago School fire studies of Rosenthal and that data obtained were "consistent with" but "in no way confirmatory of a toxin-antitoxin concept."

25. Newton, W. F.; Fujii, K.; Moyer, C. A. Attempts to reproduce the Feodorov phenomenon. Proceedings of Subcommittee on Plasma, National Academy of Sciences, National Research Council, 1961.

Report on attempts to duplicate the anaphylaxis experiments of Feodorov. Attempts to isolate a burn toxin have not been successful, and true anaphylaxis has not been observed.

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26. Newton, W. T.; Fujii, K.; Moyer, C. A. Immune specificity of burn toxin. Arch Surg (Chi.) 85:912, 1962.

See 1961 article by these authors.

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27. Pavková, L.; Dobrovsky, M.; Doležalová, J. Fundamental problems of immuno-therapy in burns. Proceedings of Subcommittee on Plasma, National Academy of Sciences-National Research Council, 1961.

See Dobrovsky, 1962.

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28. Pennell, R. B. Summary and conclusions in immunotransfusion in the treatment of burns, Subcommittee on Plasma, Natl. Academy of Sciences, Natl. Res. Coun. Div. of Med Sciences, 1961.

Summary of opinion of workers as to the efficacy of convalescent burn serum with the conclusion that "While proof is lacking for the existence of a specific burn toxin of antigenic nature and of corresponding specific burn antibodies, there are indications that specific antimicrobial antibodies may be present in the blood of organisms which have recovered from infected burn wounds. It is within the realm of possibility that beneficial effects might result from transfusion of blood, plasma, or serum from a donor possessing antibodies which react specifically against microorganisms infecting a recently burned organism."

29. Pushkar, L. N. Clinical Use of Plasma and Blood of Convalescents, Acta Chir Plast, 4, 2:120, 1962.

Report of use of convalescent burn serum in 123 clinical burns, with report of decrease of mortality (from 35% to 25%) during the early period but not in the overall period.

30. Rocha e Silva, M., Rosenthal, S. R. Release of pharmacologically active substances from the rat skin in vivo, following thermal injury. J. Pharmacol Exp Ther 132 110-6, 1961. 14 refs.

In vivo experiments with rats with indications that following burn injuries of the skin, diffusates such as histamine, bradykinin, adenosine derivatives and possibly serotonin are released.

31. Rosenbaum, M. J., and others. Inhibitory and anti-inhibitory factors in acute and healed burn sera by tissue culture technic. *Fed Proc* 19:357, 1960.

Not reviewed. Available in the National Library of Medicine.

- -

32. Rosenthal, S. M. Summary of investigations conducted at the National Institutes of Health and the Hospital del Nino, Lima, Peru, concerning the presence of a toxic antigen and the formation of antibodies in the burned organism, Appendix F, Immunotransfusion in the treatment of burns, Subcommittee on Plasma, Natl. of Sciences, Natl. Res. Council, Div. of Med. Sciences, 1961.

Report of experimental studies concluding that use of convalescent serum in burned mice has produced results "only slightly more effective" than normal gamma globulin.

- -

33. Rosenthal, S. R., Hunter, F. R.; Hunter, A. S.; Finamore, F. J.; Williams, F., Roman, L. -N. Pathogenesis of death due to burns. Role of skin. *Fed Proc* 14 124-5, 1955.

Several rat experiments to ascertain the role of the skin in burn deaths, also a note on the possibility of a burn toxin derived from the skin.

- -

34. Rosenthal, S. R.; Spurrier, W. A., Trahan, H. Specificity of thermal and radiation (Beta) "toxins" of the skin. Fed Proc 17:135, 1958.

Study of diffusates of burned skin of animals in blood, including a discussion of reaction of red cells of burned animals when "put in contact with" serum of rabbits injected with "crude toxin"-adjuvant, plus a note on these results as related to postburn anemia.

- -

35. Rosenthal, S. R. Substances released from skin following thermal injury, "burn toxin." Surgery 46:932-47, 1959. 22 refs.

Study to see if there are antigenic differences in skin injuries caused by "burns, irradiation and hypotonic solutions."

- -

36. Rosenthal, S. R., Hartney, J. B.; Spurrier, W. A. The "toxin-antitoxin" phenomenon in burned and injured human subjects. JAMA 174:957-65, 1960. 18 refs.

Demonstration by special techniques of an antitoxic-like substance in the blood of healed patients.

- -

37. Rosenthal, S. R.; Hartney, J. B., Spurrier, W. A. "Tissue-culture and serological demonstration of 'toxin-antitoxin' phenomenon in injury," in Research in Burns, edited by C. P. Artz, AIBS, Pub No 9, Washington, D. C., 1962.

Report of evidence of the presence of toxins in acute burn sera as demonstrated in inhibition of HeLa cell tissue culture growth, hemolysis of red cells of acutely burned individuals and precipitins against heated burn sera.

38. Rudnikskaia, M. Z.; Skurkovich, S. V. Electrophoretic study of anti-burn sera. Pat Fiziol Eksp Ter 6:84-5, 1962.

Not reviewed. Available in the National Library of Medicine.

39. Sell, K. W. Investigations concerning a proposed toxin and antitoxin in the serum of burned patients. Proceedings of Subcommittee on Plasma, National Academy of Sciences-National Research Council., 1961.

Report on failure to confirm the HeLa cell cytotoxicity test of Rosenthal except in the presence of hemolysis or exposure of specimens to sunlight. Also report on unsuccessful attempts to reproduce the original experiments of Feodorov in guinea pigs. Although delayed anaphylactoid reactions have been noted, no true anaphylaxis has been observed.

40. Sell, K. W. Evaluation of the "toxin-antitoxin" effects of serum from burned individuals. Office of Naval Research, 1962.

Unpublished data from a double blind study of a large number of specimens in 1961 with confirmation of Rosenthal's techniques with the HeLa cell cultures only when there was hemolysis of specimens or when there had been exposure to sunlight.

- -

41. Simonaert, A. On the subject of autointoxication after burn. Bull. Acad. Roy. Med. Belg. 20:75-91, 1955. 26 refs.

Development of the concept of Brancati that antigenic toxin is elaborated in burned tissue on the basis of anaphylactic shock.

- -

42. Simonaert, A. Etude Experimentale de la Toxemie Des Brulés, Pathol. Biologie 6, 777-800, 1958. 121 refs.

Report of studies following injection of in vitro heat-denatured serum proteins and commercial preparations of polypeptides into laboratory animals. No toxic reactions were noted on intravenous injections, but morbid or lethal effects occurred on subcutaneous administration into rabbits or into the ventral lymph sac of the frog. The hypothesis is advanced that toxicity results from hydrolysis by a proteolytic enzyme present in lymph fluid, and that the euglobulin factor extracted from peptone-produced edema provokes the same result when injected into other animals.

- -

43. Simonart, A. Toxicity of the edema of burns. *Actualites Pharmacol* 13.237-60, 1960.

Not reviewed. Available in the National Library of Medicine.

--

44. Simonart, A. J. L. Survival after lethal burn of previously treated rabbits, in *Research in Burn*, edited by C. P. Artz, AIBS Pub No. 9, Washington, D. C., 1962.

Rabbits were used to test the effects of pre-treatment with (1) phosphates or with (2) burn edema as protection against lethal burns.

--

45. Skurkovich, S. V. Treatment of thermal burns with immune serum. *Vestn. Kn. r. Grekov* 77 90-5, 1956.

Not reviewed. Available in the National Library of Medicine. See Leodorov, et al.

--

46. Skurkovich, S. V.; Zaretsky, L. I. The effect of immunotherapy on the functional condition of the kidneys in burns. *Khirurgiya (Moskva)* 7:16-21, 1959.

Not reviewed. Available in the National Library of Medicine. See Feodorov, et al.

- -

47. Toxaemia of burns. Leading article. *Lancet* i:153-5, 1960.

A general article reviewing current (1960) theories and research on burn toxemia, encompassing work in this area by Simonsart and Gedfraind (Belgium), S. R. Rosenthal (U.S.) and Feodorov (Russia).

- -

48. Tsukerman, M. A. and others. Immunotherapy of thermal burns in radiation injuries. *Vestn Khir Grekov* 83:130-5, 1959.

Not reviewed. Available in National Library of Medicine.

- -

49. Tsukerman, M. A. and others. On therapy of burn-radiation sickness with serum of burn convalescents in combination with early necrectomy. *Pat Fiziol Eksp Ter* 4:4-7, 1960.

Not reviewed. Available in National Library of Medicine.

- -

8. BIOCHEMISTRY; ALTERED PHYSIOLOGY AND PATHOLOGY,
AND OTHER EXPERIMENTAL STUDIES

1. Alegra, F. Serum transaminase in the course of burn diseases.
G Ita Derm 101:126-34, 1960. 15 refs.

Not reviewed. Available in National Library of
Medicine.

2. Amante, S., Mancini, M. (Burn shock and vitamin B₂: experimental
research. Arch Ital Chir 91:417-26, 1956. 57 refs.

Not reviewed. Available in National Library of
Medicine.

3. Antoine, G., and others. Chromatographical study of serum and
urinary amino acids in burned patients. Afr Franc Chir 16:21-9, 1960.

Not reviewed. Available in National Library of
Medicine.

4. Baar, S. Studies on urinary peptides isolated from patients suffering from burns. *J Clin Path* 9:144-47, 1956. 20 refs.

Study of urinary peptides for 48 hour period following burns. Each technique of separation resulted in somewhat different fractions but it appeared that peptides represented an increase in substances normally present. High CHO content, believed related to glycoproteins. (There is some evidence that glycoproteins migrate to alpha₂ globulins electrophoretically.)

- -

5. Bailey, B.N. Hyperglycaemia in burns. *Brit Med J* 2:1783-5, 1960. 17 refs.

Short article with case reports illustrating etiology of hyperglycemia in burns. Based on work at Stoke-Mandeville Plastic Surgery Center.

- -

6. Birke, G.; H. Duner; S.O. Liljedahl, B. Pernow, L.O. Plantin, L. Troell. Histamine, catechol amines and adrenocortical steroids in burns. *Acta Chir Scand* 114:87-98, 1957/58. 33 refs.

One of a series of studies from this group of Swedish burn investigations. Excretion studies in 9 patients.

- -

7. Blocker, T.G., Jr., Levin, W.C., Lewis, S.R.; Snyder, C.C., Hurst, W.R. Radioactive techniques in the study of protein metabolism of severe burn patients. Surg Forum 4:428-31, 1953.

Preliminary study on 22 patients. See Ann Surgery, 1954.

- -

8. Blocker, T.G., Jr., Levin, W.C., Lewis, S.R.; Snyder, C.C. The use of radioactive sulphur labeled methionine in the study of protein catabolism in burn patients. Ann Surg 140(4), 1954.

Report of normal or increased anabolism following severe burns obscured by relatively greater catabolic response.

- -

9. Blocker, T.G., Jr.; Levin, W.C., Perry, J.E.; Lewis, S.R.; Blocker, V. The influence of the burn state on the turnover of serum proteins in human subjects. A.M.A. Arch Surg 74:792, 1957.

Analysis of data in radioisotope studies in burned patients.

- -

10. Colson, P. Early vascular shock in burn patients. *Ann Chir Plast* 5:243-50, 1960.

Discussion of early and late manifestations of disturbed pathophysiology in extensive burns.

- -

11. Decoulx, P. Some aspects of water and electrolyte disturbances in severe burns. *Lille Med* 6:658-62, 1961. 6 refs.

Discussion of the "troisieme secteur" in severe burns, composed of water, electrolytes, and protein.

- -

12. Dolecek, R., J. Kalina; L. Klabusay. Neuroplegics and hormones in the treatment of burns. *Acta Chir Plast* 1:115-39, 1959. 49 refs.

Experiences at a Czech Burns Center with ataractic drugs employed for control of pain and anxiety or in hypothermia regimen.

- -

13. Doleček, R.; Kalina, J.; Klabusay, L.; Endryas, L. Significance of the Organism's Reaction to Burns and the Possibility of Influencing it. *Acta Chir Plast* 3(1):35-48, 1961. 24 refs.

Review of the following problems: reaction of the suprarenal cortex and behavior of ADH after burns; use of neuroplegics to ameliorate reaction to stress; indications for hormone therapy, particularly synthetic anabolic compounds, and "metabolic paresis" produced by a partial block in glycolysis.

14. Dolecek, R.; Kalina, J. Recent views on the pathogenesis of some clinical features in burn disease. *Acta Chir Plast (Praha)* 4:278-94, 1962.

A review of disorders in basic cellular metabolic processes which may explain impairment of energy balance in the patient with severe burns.

15. Eades, C.H., Jr.; Pollack, R.L.; Hardy, J.D. Thermal burns in man. 9. Urinary amino acid patterns. *J Clin Invest* 34:1756-9, 1955. 10 refs.

Report of excretion patterns of 16 amino acids in the urine of patients immediately before and during convalescence.

16. Fazzari, C. Histological changes of the thymus in the course of severe experimental burns. *Minerva Med* 80:232-9, 1960.

Not reviewed. Available in National Library of Medicine.

--

17. Fogelman, M. J., Wilson, B. J. A different concept of volume replacement in traumatic hypovolemia. Observations on injured man and animal. *Amer J Surg* 99:694-700, 1960. 16 refs.

Extracellular fluid - S^{35} volume studies in patients and experimental animals, with data to quantitate the volume of salt water loss in various types of trauma, including burns.

--

18. Fossoul, C. A clinical method of determination of ammonia in the blood. Its use in the determination of ammoniemia in burned rats, *Ann Soc Roy Sci Med Natur Brux* 14:57-66, 1961.

Not reviewed. Available in National Library of Medicine.

--

19. Fox, C. L., Jr., Lasker, S. E.; Winfield, J. M., Mersheimer, W. L. Albumin, potassium, sodium, and chloride redistribution and erythrocyte loss after surgical trauma and extensive burns. *Ann Surg* 140:524-34, 1954. 25 refs.

Study of compartment relationships under normal conditions and following trauma. Use of Cr-51 tagged red cells for determination of circulating red cell mass with simultaneous assay of plasma volume with ^{131}I tagged albumin. Clinical subjects and laboratory animals (mice) employed, in the latter viscera were analyzed for radioactivity and sodium, potassium, and chloride content.

20. Fox, C. L., Jr.; Lasker, S. E.; Winfield, J. M. Relative lack of efficacy of fluid therapy; comparison of flash burns and scalds in monkeys. *Amer J Surg* 99:690-3, 1960. 13 refs.

Preliminary report of difference between 25% full-thickness immersion burns in water at 60-85°C for varying periods of time and charring from 2 exposures to a magnesium flash burn at 1000°C for 0.7 sec.

21. Fox, C. L., Jr., Lasker, S. E. Response to fluid therapy and tissue electrolyte changes in scalded and flash burned monkeys. *Surg Gynec Obstet* 112:274-84, 1961. 29 refs.

Study of response to therapy in 25% full-thickness immersion burns of approximately 55% at 75°C for 10-15 sec. in comparison with similar area burns sustained by charring in a flame-proof chamber with electrically ignited magnesium powder.

22. Fox, C. L., Jr. Inadequacy of fluid therapy in scald and flash burns in monkeys; blood and tissue changes -- study for toxic factors, in Research in Burns, edited by C. P. Artz, AIBS, Pub No 9, Washington, D. C. 1962.

See previous reference.

- -

23. Fox, C. L., Jr.; Lanker, S. E. Protection by histamine and metabolites in anaphylaxis, scalds, and endotoxin shock. Amer J Physiol 202:111-3, 1962. 22 refs.

Study in mice of role of histamine with observation that a protective effect is achieved by dosage prior to thermal trauma but not 1 hour after scalding or after a dose of endotoxin.

- -

- 23a. Grogan, J. B., Artz, C. P. Functions of the host defense mechanisms under various stress conditions. Surg Forum 13:47-8, 1962.

Study of clearance rate of staphylococci injected i-v in dogs in burns and other stress.

- -

24. Hardy, J.D., Neely, W.A.; Wilson, F.C., Jr.; Milnor, E.P.; Wilson, H. Fluid kinetics following thermal burns in man. A preliminary report. Surgery 34:457-69, 1953. 8 refs.

Review of pathologic changes affecting fluid requirements.
Use of body weight records as an adjunct to urinary excretion for guidance in therapy.

- -

25. Hardy, J.D.; Jabbour, E.; Lovelace, J.R.; Neely, W.A.; Wilson, F.C., Jr. Thermal burns in man. IV. Body weight changes during therapy. Surgery 38:685-691, 1955. 13 refs.

Study in 14 burned patients of response to fluid therapy (Evans formula) during period of edema and thereafter.

- -

26. Hardy, J.D., Lovelace, J.R., Jabbour, E., Bramlitt, E.E. Thermal burns in man. VI. Body fluid compartments during early therapy. Amer Surg 21:969-74, 1955. 7 refs.

Study in 7 patients with lesions of over 20% the plasma volume, blood volume, thiocyanate space and total body water increases in thiocyanate space and body weight were proportional to the extent of burn.

- -

27. Hardy, J. D.; Neely, W. A.; Wilson, F. C., Jr. Thermal burns in man. VII "Insensible fluid loss." Surgery 38:692-5, 1955.

Study in 5 patients with major burns; attempt to measure insensible fluid loss from lungs, skin and burned areas.

--

28. Hardy, James D. Physiology, Summary, in Research in Burns, edited by C. P. Artz, AIBS Pub No 9, Washington, D. C., 1962.

Review of papers on burn pathophysiology presented at the International Symposium on Research in Burns in 1960 with summary of newer trends in the field of biophysics.

--

29. Harvengt, C. The blood lipids after grave burns Rev Belg Path 28:171-7, 1961. 12 refs.

Study of plasma lipids after experimental burns in rabbits. Cholesterol double normal value after 12 hours. Phospholipids early increase followed by fall. Amount of edema not important. Following peptone injections, an increase is noted, but not in relation to the extent of burns.

--

30. Henry, C. L.; Amspacher, W. H. Potassium migration in experimental burns. *Surgery* 36 740-50, 1954. 5 refs.

Studies at the Army Surgical Research Unit in acute burns in the dog with findings to indicate that potassium lost from traumatized tissue is deposited in normal tissue.

31. Henry, C. L.; Lichter, R. J.; Daw, J. C. Insulin hypersensitivity in acute experimental burns. *Surg Gynec Obstet* 100:265-7, 1955. 3 refs.

A state of insulin hypersensitivity as reflected by plasma potassium depression was demonstrated in burned dogs.

32. Hirsch J. E. General considerations with regard to electrolyte and nitrogen balance and other factors. *Prensa Med Argent* 47 2972-5, 1960. 7 refs.

Summary of balance data with presentation of two clinical cases. (Burns Institute, Buenos Aires).

33. Hirsch, J. E.; Nejamkis,; Vaccaro, F., Diaz, P. Curves of urinary elimination of nitrogen, sodium and potassium in burns. *Sem Med (B Am)* 117:1050-1, 1960

Analysis of balance data according to the edema, diuresis and subsequent phases of acute extensive burns with discrepancies noted in time of occurrence of maximum excretion levels with those reported by Barnes, Cope and Moore.

34. Hladovec, Von J., Horakova, Z., Mansfeld, V. Antiphlogistic action of protease inhibitor obtained from potatoes in experimental burns. *Arzneimittelforsch* 11:104-6, 1961. 4 refs.

An inhibitor of proteases isolated from potatoes was noted to have a marked inhibitory influence on the inflammatory reaction following burns in rats and mice but no effect systemically.

35. Jackson, S. H., Farmer, A. W., Slater, R. J., DeWolfe, M. S. The resolution of urinary or serum proteins by chromatography on DEAE cellulose columns with particular reference to urinary proteins after thermal burns. *Canad J Biochem* 39:881-9, 1961.

With starch block electrophoresis and DEAE cellulose chromatography techniques combined a total of 22 different serum proteins are distinguished. Techniques are presented in detail for study of urinary proteins in burn patients, and chromatograms from a number of cases are analyzed. Increases in the various zones are discussed from the standpoint of possible source.

36. Jackson, S. H., Farmer, A. W. Urinary biocolloids after thermal burns. *Research in Burns*, edited by C. P. Artz, AIBS, Pub No 2, Washington, D. C., 1962.

Using techniques outlined previously studies were made in 19 urine specimens from 5 burned children and the percentage of total protein in each of the nine chromatographic zones charted, each area was also expressed as mg of equivalent albumin. It was postulated that the general increase in protein excretion, which was mild rather than spectacular, was related to increased renal permeability to proteins.

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37. Kahna, J.; Klabusay, L.; Kysela, B.; Doleček, R. Metabolic Changes after Burns. I. Changes in Metabolism of Glycogen in Burned Rats. *Acta Chir Plast* 4(1):4, 1962.

Study of prolonged decreased glycogen synthesis in muscle and liver of burned rats without a corresponding decrease in blood glucose or glycogen levels.

- -

38. Lanchantin, G. F., and others. Serum protein changes in thermal trauma. I. Electrophoretic analysis at pH8.16 and 4.5. U.S. Army Surgical Research Unit, Brooke Army Medical Center, Fort Sam Houston, Texas Research Report MEDEW-RS-1-57, 1957. 25 p. 46 refs.

Not reviewed. Available in the National Library of Medicine.

- -

39. Lanchantin, G. F., and others. Serum protein changes in thermal trauma. 2. Apparatus and technique for the separation of serum lipoproteins in a starch medium. (U.S. Army Surgical Research Unit, Brooke Army Medical Center, Fort Sam Houston, Texas Research Report MEDEW-RS-9-57 May 1957) 29 p. 43 refs.

Not reviewed. Available in National Library of Medicine.

--

40. Lanchantin, G. F., Lozano, E. R. Serum protein changes in thermal trauma. 3. Serum lipoproteins following burns. (U.S. Army Surgical Research Unit, Brooke Army Medical Center, Fort Sam Houston, Texas Research Report MEDEW-RS-10-57 June 1957) 18 p. 27 refs.

Not reviewed. Available in National Library of Medicine.

--

41. Lanchantin, G. F., and others. Serum protein changes in thermal trauma. 4. Some quantitative and qualitative aspects of total serum glycoprotein and seromucoid following burns. (U.S. Army Surgical Research Unit, Brooke Army Medical Center, Fort Sam Houston, Texas Research Report MEDEW-RS-12-57 June 1957) 29 p. 50 refs.

Not reviewed. Available in National Library of Medicine.

--

42. Lasker, S. G.; Fox, C. L., Jr. The comparative protective action of histamine, L-histidine and their metabolites on endotoxin and thermal shock in mice. Fed Proc 19:103, 1960.

Study of protective effects of histamine and related compounds against thermal trauma and endotoxin shock.

43. Laver, M. B. The effect of ganglion-blocking agents on survival of rats subjected to acute thermal injury. Surgery 40:520-9, 1956. 24 refs.

Treatment of experimental burns in rats with ganglionic blocking agents (hexamethonium or azamethonium). Report of prolonged mean survival time and suggestion that hypotension resulted in decrease in fluid loss.

44. Loizzi, A. Antiallergic treatment in severe shock due to burns. Riforma Med 66:202-4, 1952.

Not reviewed. Available in the National Library of Medicine.

45. Lorthoir, J. Personal studies on the pathological anatomy and physiopathology of the burn. *Acta Chir Belg* 60:424-51, 1961.

Not reviewed. Available in the National Library of Medicine.

- -

46. Luccioni, F., and others. On the pathology and pathogenesis of death in extensive burns. Experimental research. Results of epidermectomy. *Marseille Chir* 13:363-7, 1961.

Not reviewed. Available in the National Library of Medicine.

- -

47. Macchitella, E. Experimental research in the physiopathology of burns. *Minerva Chir* 12:1668-70, 1957. 12 refs.

Not reviewed. Available in the National Library of Medicine.

- -

48. McCarthy, M. D. A comparison of plasma expanders with blood and plasma as a supplement to electrolyte solutions in the treatment of rats undergoing third degree burns of fifty percent of the body surface. *Ann Surg* 136:546-53, 1952. 21 refs.

Establishment of 100% mortality in 6 hours from a 50% scald at 90°C for 35 seconds (ether anesthesia) followed by continuous i-v infusion of 18% of body wt in fluids for 10 hours. Survival in groups of 12 at 10 days as follows: whole blood plasma 75%, saline 17%, red cell suspension 27%; plasma 17%, P. V. P. 33%, oxypolygelatin 33%; fluid gelatin 17%; saline lactate 42%.

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49. Milstein, S. W. Utilization of C¹⁴ labeled cottonseed oil emulsion by normal and thermally injured rats. *Amer J Physiol* 202:133-6, 1962, 21 refs.

Standard thermal injury in the rat did not change the rate of oxidation of the labeled oil emulsion although normal blood clearance times were slightly above those in the control group.

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50. Millican, C., Stohlman, E. F. Relative effectiveness of certain drugs against shock produced in mice from tourniquet and burn trauma. *Amer J Physiol* 185:195-200, 1956. 29 refs.

Therapeutic test (i. e. influence on survival) in mice of a number of agents reported to ameliorate effects of shock from burns and other trauma. Chlorpromazine and, at times, Dibenamine were effective. No beneficial effect was noted from other substances.

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51. Mohring, D.; Ess, H. Enzyme and electrophoretic research on guinea pig organs before and after burns. *Zschr Ges Exp Med* 12:401-7, 1957. 33 refs.

Not reviewed. Available in the National Library of Medicine.

52. Moore, F. D. Metabolism, Summary, in *Research in Burns*, edited by C. P. Artz, AIBS, Pub No 9, Washington, D. C., 1962.

A summary of current metabolism research related to burn therapy, including the problems of volume regulation and maintenance; blood, colloids, and salt solutions; special organs and metabolism, etc.

53. Morgan, H. C., Andrews, R. P., Jurkiewicz, M. J. The effect of thermal injury on insensible weight loss in the rat. *Surg Forum* 6:78-84, 1955. 10 refs.

Study of elevated insensible weight loss (i. e. loss of CO_2 and water vapor through the skin and lungs less the mass of oxygen absorbed) in rats, which was found to range from 60% to 200% above normal.

54. Musil, J.; Bartos, F. Contribution on Metabolism of Glycoprotein in Burns, *Acta Chir Plast* 4(2):126-131, 1962.

Increased glycoprotein levels found after the acute stage of burns were interpreted as a reflection of reparative processes rather than destruction.

- -

55. Nardi, G. L. "Essential" and "nonessential" amino acids in the urine of severely burned patients. *J Clin Invest* 33:847-54, 1954. 29 refs.

Study of amino-aciduria following burns and trauma with quantitative increase of normal "nonessential" amino acids and presence of "essential" amino acids normally not found in the urine.

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56. Nejmkis, M.; Reibel, O. Method of determination of sodium, potassium and nitrogen in bandages. *Sem Med (B Air)* 117:667-8, 1960.

Employment of dressings with a topical agent free of sodium, nitrogen and potassium in order not to have adherence to the wound. Following agitation in distilled water for 24 hours samples were removed for Na and K, after which sodium bicarbonate was added in order to facilitate solution of protein. After another 24 hours determinations were made.

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57. Prendergast, J. J.; Fenichel, R. L., Daly, B. M. Albumin and globulin changes in burns as demonstrated by electrophoresis. *AMA Arch Surg* 64:733-40, 1952.

Results of electrophoretic studies in 8 patients with emphasis upon gamma globulin concentration as an index of severity of burn: little increase in lesions of 15% and below, great increase in burns of 25%-35%.

58. Rosenthal, S. M.; Millican, R. C. The role of fluids, electrolytes and plasma proteins in experimental traumatic shock and hemorrhage. *Pharmacol Rev* 6:489-520, 1954. 287 refs.

Review of methods of producing standardized trauma and shock and evaluation of blood, plasma, and electrolyte solutions on curtailment of edema, restoration of blood volume and correction of depletions of fluids, electrolytes and protein in undamaged tissues.

59. Safrankova, B.; Brezina, M. Peptide-like Compounds in the Urine of Patients Suffering from Burns. *Acta Chir Plast* 4(1):18-25, 1962.

Increase in peptide-like substances in the urine following thermal trauma with description of techniques employed. Also note of correlation between urine peptide concentration and antibody titers in the blood which have been reported by Pavkova.

60. Gschwalb, E. The effect of isoindoline on survival of rats subjected to acute thermal burns. *Surgery* 46:383-7, 1959. 21 refs.

Use of isoindoline, a blocking agent, to observe survival of burned rats following thermal trauma at varying temperatures.

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61. Seligman, L., Webber, F., Blocker, T.G., Jr. Experimental study of the effects of burns on the characteristics of lymph fluid. Annual Report, U.S. Army Contract DA-49-007-MD-447, The University of Texas, Medical Branch, 1960.

Studies of the lymph fluid in burned dogs following cannulation of the thoracic duct with finding of free hemoglobin within a short period following injury. Characteristic alterations in the normal electrophoretic pattern occurred with a drop in albumin and a rise in beta globulin.

- -

62. Shanklin, W.M. The human hypophysis in cases of burns. *Acta Endocrinol* 21:1-7, 1956. 11 refs.

Histological studies in the dog and in 6 patients who died as a result of severe burns.

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63. Snively, W. D., Jr. The body's response to burning. GP 20(3): 132-44, 1959.

Outline of burn pathophysiology by medical director of Mead, Johnson, and Co. according to local effects, effects on the body fluids, metabolic effects and psychologic effects. An excellent article for the general practitioner with 45 cartoon-type illustrations.

64. Soroff, H. S., Pearson, E., Reiss, E.; Artz, C. P. The relationship between plasma sodium concentration and the state of hydration of burned patients. Surg Gynec Obstet 102:472-82, 1956. 3 refs.

Review of records of 24 severely burned patients undertaken to help clarify the relationships between the patients' state of hydration and plasma sodium concentration.

65. Soroff, H. S., and others. An analysis of alterations in body composition (U.S. Army Surgical Research Unit Brooke Army Medical Center Fort Sam Houston, Texas Research Report MEDEW-RS-5-60 October 1960) 29 p.

Not reviewed. Available in National Library of Medicine.

66. Stirman, J. A., Prudden, J. F., Young, M. K., Jr. Comparison of the volumes of distribution of sucrose and sodium thiosulfate as an estimate of extracellular fluid in burned humans. Surg Forum 5:770-4, 1954. 7 refs.

Conclusion that use of sucrose is preferable to sodium thiosulfate for extracellular fluid volume. Sodium thiosulfate "space" may be better as an estimate of volume of distribution of sodium.

67. Thomas, K. Plasma calcium and phosphorus, after experimental burn. Rev Belg Path 28:350-7, 1964. 9 refs.

Studies in rabbits with experimental burns, plasma calcium decreases rapidly, after which a gradual rise occurs, phosphorus rises immediately but falls to subnormal levels within 48 hours.

68. Walker, J. M., Bernes, M. T., Walker, A. R., Barnett, E. M.; Barol, B. Changes in tissue sodium and potassium of rats following a severe burn. Surg Forum 4:431-3, 1953. 2 refs.

Preliminary studies indicating changes in local tissues and those outside the burned area.

69. Wust, H. The status of serum albumin after burns in man. *Klin Wochr* 34:1127-31, 1956. 25 refs.

Not reviewed. Available in the National Library of Medicine.

70. Young, M.K., Jr.; Seraile, L.G.; Brown, W.L. Inhibition of glucose utilization following thermal injury: uptake studies by diaphragm in plasma from burned rats. *Amer J Physiol* 191:119-23, 1957. 30 refs.

Studies indicating a disturbance in glucose utilization, appears to be other than in the conversion of glucose to CO_2 ; a dialyzable principle is present in the plasma. Epinephrine may be a causative agent.

71. Young, M.K., Jr., and others. Carbohydrate metabolism in thermal injury, inhibition of anaerobic glycolysis. U.S. Army Surgical Research Unit, Brooke Army Medical Center, Fort Sam Houston, Texas Research Report MEDEW-RS-9-58, 1958. 11 p.

Not reviewed. Available in the National Library of Medicine.

XIII
JOURNAL REFERENCES

- A. For articles abstracted.
- B. Available in the National
Library of Medicine.

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A. FOR ARTICLES ABSTRACTED

Acta Chirurgiae Plasticae
 Acta Chirurgica Belgica
 Acta Chirurgica Scandinavica
 Acta Dermatologica
 Acta Endocrinologica
 Acta Haematologica
 Acta Paediatrica Espanola
 Acta Pharmacologica et Toxicologica
 Acta Physiologica Scandinavica
 Actualites Pharmacologiques
 Afrique Francaise Chirurgicale
 Aggressologie
 Algerie Medicale
 Allergie Asthma
 American Journal of Clinical Pathology
 American Journal of the Medical Sciences, The
 American Journal of Medicine
 American Journal of Nursing, The
 American Journal of Pathology, The
 American Journal of Physical Medicine
 American Journal of Physiology
 American Journal of Surgery, The
 American Practitioner and Digest of Treatment
 American Surgeon, The
 Anaesthesist, Der
 Annales de la Faculté de Médecine--Lima
 Annales de Chirurgie Plastique
 Annales de Médecine Légale et de Criminologie (Paris)
 Annals of Internal Medicine
 Annals of the New York Academy of Sciences
 Annals of the Royal College of Surgeons of England
 Annals of Surgery
 Antibiotic Medicine and Clinical Therapy
 Antibiotics Annual
 Antibiotics and Chemotherapy
 Archiv für Kinderheilkunde
 Archiv für Klinische Chirurgie, Langenbeck's

Archiv für Klinische und Experimentelle Dermatologie
 Archives Francaises de Pediatrie
 Archives of Industrial Health, AMA
 Archives Internationales de Pharmacodynamie et de Therapie
 Archives of Pediatrics
 Archives of Physical Medicine and Rehabilitation
 Archives of Surgery, AMA
 Archivio Italiano di Chirurgia
 Archivio per le Scienze Mediche
 Arizona Medicine
 Arzneimittel-Forschung
 Ärztliche Forschung
 Ärztliche Wochenschrift
 Atrahlen Therapie
 Australian and New Zealand Journal of Surgery
 Bibliotheca Haematologica
 Blood
 Bollettino della Societa Italiana di Biologia Sperimentale
 Bordeaux Chirurgical
 Boston Medical Quarterly, The
 British Journal of Anaesthesia
 British Journal of Clinical Practice
 British Journal of Experimental Pathology
 British Journal of Plastic Surgery
 British Journal of Surgery, The
 British Medical Bulletin
 British Medical Journal
 Bulletin de L'Académie Nationale de Médecine
 Bulletin de L'Académie Royale de Médecine de Belgique
 Bulletin of Hospital for Joint Diseases
 Bulletin of the Hospital for Sick Children (Toronto)
 Bulletin de la Societe Internationale de Chirurgie
 California Medicine
 Canadian Anaesthetists' Society Journal, The
 Canadian Journal of Biochemistry and Physiology
 Canadian Medical Association Journal, The
 Chinese Medical Journal
 Chirurg, Der
 CIBA Clinical Symposia

Circulation Research
 Clinical Medicine (Winnetka)
 Clinical Science
 Comptes Rendus des Séances de la Société de Biologie
 Delaware State Medical Journal
 Deutsche Medizinische Wochenschrift
 Deutsche Zeitschrift für Gerichtliche Medizin
 Deutsches Medizinisches Journal
 Dia Medico, El
 Duodecim
 Endocrinology
 Federation Proceedings
 Folia Medica (Naples)
 GP
 Gastroenterology
 Geriatrics
 German Medical Monthly
 Giornale Italiano di Chirurgia
 Giornale Italiano di Dermatologia e Sifilologia
 Guy's Hospital Reports
 Harlem Hospital Bulletin, The
 Hautarzt, Der
 Helvetica Chirurgica Acta
 Hospital Progress
 Illinois Medical Journal, The
 Indian Journal of Medical Sciences
 Industrial Medicine and Surgery
 International Archives of Allergy and Applied Immunology
 Journal of the American Dietetic Association
 Journal of the American Geriatrics Society
 Journal of the American Medical Association, The
 Journal of the American Medical Women's Association
 Journal of Applied Physiology
 Journal of Bacteriology
 Journal of Bone and Joint Surgery, The
 Journal of the Canadian Association of Radiologists
 Journal of Clinical Investigation, The
 Journal of Clinical Pathology

Journal of Hygiene, The
 Journal of the Indiana State Medical Association, The
 Journal of the International College of Surgeons, The
 Journal of the Kentucky State Medical Association
 Journal Lancet, The (U.S.)
 Journal of the Maine Medical Association, The
 Journal of the Medical Association Georgia
 Journal of the Medical Society of New Jersey, The
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 Journal of Occupational Medicine
 Journal of the Oklahoma State Medical Association, The
 Journal of the Oslo City Hospitals
 Journal of Parasitology, The
 Journal of Pathology and Bacteriology, The
 Journal of Pharmacology and Experimental Therapeutics, The
 Journal of Pharmacy and Pharmacology, The
 Journal of the Royal Army Medical Corps
 Journal of the South Carolina Medical Association, The
 Journal of Surgical Research, The
 Journal of Trauma, The
 Khirurgiia (Moskva)
 Klinische Monatsblätter für Augenheilkunde
 Klinische Wochenschrift
 Lancet, The (England)
 Lille Chirurgial
 Lille Medical
 Lyon Chirurgial
 Lyon Medical
 Marseille Chirurgial
 Medical Clinics of North America
 Medical Journal of Australia, The
 Medical Services Journal Canada
 Medicina Clinica (Barcelona)
 Medicina Española
 Medizinische Klinik
 Medizinische Monatsschrift
 Medizinische Welt, Die
 Metabolism--Clinical and Experimental
 Military Medicine

Minerva Chirurgica
 Minerva Dermatologica
 Minerva Medica
 Minnesota Medicine
 Mississippi Doctor
 Monatsschrift für Kinderheilkunde
 Münchener Medizinische Wochenschrift
 Nature
 Nebraska State Medical Journal, The
 Nederlands Tijdschrift voor Geneeskunde
 New England Journal of Medicine, The
 New York State Journal of Medicine
 New Zealand Medical Journal, The
 Nordisk Medicin
 Northwest Medicine
 Pathologie et Biologie
 Pediatric Clinics of North America
 Pediatrics
 Pennsylvania Medical Journal, The
 Pharmacological Reviews
 Physical Therapy Review, The
 Plastic and Reconstructive Surgery and the Transplantation Bulletin
 Policlínico--Prática, Il
 Postgraduate Medicine
 Practitioner, The
 Praxis
 Prensa Médica Argentina, La
 Presse Médicale, La
 Proceedings of the Institute of Medicine of Chicago, The
 Proceedings of the Royal Society of Medicine
 Proceedings of the Society for Experimental Biology and Medicine
 Radiologia Clínica
 Rassegna Internazionale di Clinica e Terapia
 Revista da Associação Médica Brasileira
 Revista Brasileira de Cirurgia
 Revista Clínica Española
 Revista Médica de Costa Rica
 Revue Belge de Pathologie et de Médecine Expérimentale
 Revue Médicale de Liège

Revue Médicale du Moyen Orient
 Revue Médicale de Nancy
 Rhode Island Medical Journal
 Riforma Medica, La
 Rivista di Patologia e Clinica della Tubercolosi
 Schweizerische Medizinische Wochenschrift
 Science
 Semaine Médicale Professionnelle et Médico-Sociale, La
 Semana Médica, La
 South Dakota Journal of Medicine and Pharmacy, The
 Southern Medical Journal
 Strahlentherapie
 Surgery
 Surgery, Gynecology and Obstetrics
 Surgical Clinics of North America, The
 Surgical Forum
 Texas Reports on Biology and Medicine
 Texas State Journal of Medicine
 Thérapie
 Therapie der Gegenwart, Die
 Tidsskrift for Den Norske Lægeforening
 Toulouse Medical
 Transactions of the Association of American Physicians
 Transactions of the Association of Industrial Officers
 Transactions. Ophthalmological Society of the United Kingdom
 Triangle
 Ugeskrift for Læger
 L'Union Médicale du Canada
 United States Armed Forces Medical Journal
 West Indian Medical Journal, The
 Western Journal of Surgery, Obstetrics and Gynecology
 Wiener Klinische Wochenschrift
 Wiener Medizinische Wochenschrift
 Wisconsin Medical Journal, The
 Zeitschrift für die Gesamte Experimentelle Medizin
 Zentralblatt für Chirurgie

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Medicina Mex.
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Techn. Hosp. (Par.)
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Z. Unfallmed. Berufskr.