

**NACB LMPG 2004 Data Abstraction Form
Reference List**

Clinical Question: Does the use of pH paper to diagnose and monitor treatment of chemical exposure in the ED and Urgent Care patient populations improve length of stay and severity of burn compared to empirical treatment (no monitoring)?

Databases Searched: Medline OVID (1966 – April Week 3, 2003)
AHRQ - National Guideline Clearinghouse

Search Terms/Hits: pH
pH paper
Chemical burns
Eye, Ocular
Lavage, wash, tears
Emergency

Search criteria:

(pH AND chemical burns or Burns, Chemical/) OR

(pH AND eye or EYE BURNS/ or EYE/ AND Lavage or wash or tears) OR

(pH AND chemical burns or Burns, Chemical/ AND eye.mp or EYE BURNS/ or EYE/ AND ocular) OR

(pH AND chemical burns or Burns, Chemical/ AND ocular) OR

(pH AND chemical burns or Burns, Chemical/ AND eye.mp or EYE BURNS/ or EYE/) OR

(pH AND emergency or EMERGENCIAS/ AND Reagent Strips/ or pH paper or Gastric Acidity Determination/) OR

(pH AND eye or EYE BURNS/or EYE/ AND emergency or EMERGENCIAS/)

#	Search History	Results
1	pH.mp	162823
2	chemical burns.mp or Burns, Chemical/	4004
3	eye.mp or EYE BURNS/ or EYE/	99021
4	ocular.mp	44415
5	(Lavage or wash or tears).mp	37551
6	emergency.mp or EMERGENCIES/	76616
7	Reagent Strips/ or pH paper.mp or Gastric Acidity Determination/	7217
8	1 and 2	54
9	1 and 3	639
10	1 and 3 and 5	56
11	1 and 2 and 3 and 4	11
12	1 and 2 and 4	12
13	1 and 2 and 3	23
14	8 or 10 or 11 or 12 or 13	106
15	1 and 6	369
16	7 and 15	21
17	1 and 3 and 6	4
18	14 or 16 or 17	127

Plus one guideline hit on the AHRQ National Guideline Clearinghouse

Group/ No.	Citation	Abstract Review			Full Text Review			Comments		
		Include?			Reviewers	Include?			Reviewers	
		1	2	3		1	2			3
pH1-1	1. Inkeniene, A. M.; Klimas, R.; Briedis, V., and Maciulevicius, J. (Department of Pharmaceutical Technology and Pharmacy Organization, Kaunas University of Medicine, A. Mickeviciaus 9, 3000 Kaunas, Lithuania). [Development of formulation of hipromellose eye drops (artificial tears)]. [Lithuanian]. Medicina (Kaunas). 2003; 39(1):77-82.	N	N	N	JN LW DT				Foreign	
pH1-2	2. Schrage, N. F.; Kompa, S.; Haller, W., and Langefeld, S. (Department of Ophthalmology, Eye-Clinic RWTH Aachen, Pauwelstrasse 30, D-52057 Aachen, Germany. schrage@acto.de). Use of an amphoteric lavage solution for emergency treatment of eye burns. First animal type experimental clinical considerations. Burns. 2002 Dec; 28(8):782-6.	Y	Y	Y	JN LW DT	N	N	Y	JN LW DT HV	pH paper not used, pH meter electrode measurements
pH1-3	3. Gupta, S. K.; Gupta, V.; Joshi, S., and Tandon, R. (Department of Pharmacology, All India Institute of Medical Sciences, New Delhi, India). Subclinically dry eyes in urban Delhi: an impact of air pollution? Ophthalmologica. 2002 Sep-2002 Oct 31; 216(5):368-71.	N	N	N	JN LW DT					
pH1-4	4. Ozcan, Z.; Ozcan, C.; Erinc, R.; Dirlik, A., and Mutaf, O. (Department of Nuclear Medicine, Ege University Medical Faculty, 35100-Bornova, Izmir, Turkey. zehraozcan@ixir.com). Scintigraphy in the detection of gastro-oesophageal reflux in children with caustic oesophageal burns: a comparative study with radiography and 24-h pH monitoring. Pediatric Radiology. 2001 Oct; 31(10):737-41.	N	N	N	JN LW DT					Pull for Question 2

pH1-5	5. Gundarova, R. A.; Chesnokova, N. B.; Shekhter, A. B.; Davydova, N. G.; Pekshev, A. V.; Kvasha, O. I.; Beznos, O. V., and Gorbacheva, O. A. [Effects of gaseous flow containing nitric oxide on the eyeball structures (an experimental study)]. [Russian]. Vestnik Oftalmologii. 2001 Jul-2001 Aug 31; 117(4):29-32.	N	N	N	JN LW DT					Foreign
pH1-6	6. Herber, S.; Grus, F. H.; Sabuncuo, P., and Augustin, A. J. (Department of Ophthalmology, University of Mainz, Germany). Two-dimensional analysis of tear protein patterns of diabetic patients. Electrophoresis. 2001 May; 22(9):1838-44.	N	N	N	JN LW DT					
pH1-7	7. Ghose, S.; Garodia, V. K.; Sachdev, M. S.; Kumar, H.; Biswas, N. R., and Pandey, R. M. (Dr. Rajendra Prasad Centre for Ophthalmic Sciences, All India Institute of Medical Sciences (AIIMS), Ansari Nagar, New Delhi, India). Evaluation of potentiating effect of a drop of lignocaine on tropicamide-induced mydriasis. Investigative Ophthalmology & Visual Science. 2001 Jun; 42(7):1581-5.	N	N	N	JN LW DT					
pH1-8	8. Blesa, E.; Moreno, C.; Alaminos, M.; Gamez, S.; Jimenez, C. J.; Nunez, R.; Cabrera, R., and Santamaria, J. I. (Hospital Materno-Infantil de Badajoz y de Granada). [Severe caustic injuries of the esophagus: when to replace the esophagus]. [Spanish]. Cirugia Pediatrica. 2001 Jan; 14(1):34-7.	N	N	N	JN LW DT					Foreign
pH1-9	9. Karkkainen, T. R. (Southern College of Optometry, Memphis, Tennessee 38104, USA. Kark@sco.edu). The effect of refrigeration on the osmolality and pH of nonpreserved artificial tears containing carboxymethylcellulose. Optometry & Vision Science. 2001 Jan; 78(1):37-9.	N	N	N	JN LW DT					

pH1-10	10. Gionfriddo, J. R.; Melgarejo, T.; Morrison, E. A.; Alinovi, C. A.; Asem, E. K., and Krohne, S. G. (Department of Veterinary Clinical Sciences, School of Veterinary Medicine, Purdue University, West Lafayette, IN 47906, USA). Comparison of tear proteins of llamas and cattle. American Journal of Veterinary Research. 2000 Oct; 61(10):1289-93.	N	N	N	JN LW DT					
pH1-11	11. Gerard, M.; Josset, P.; Louis, V.; Menerath, J. M.; Blomet, J., and Merle, H. (Service d'Ophtalmologie, Centre Hospitalier Universitaire de Fort de France, Hopital Pierre Zobda Quitman, BP 632, 97261 Fort de France Cedex). [Is there a delay in bathing the external eye in the treatment of ammonia eye burns? Comparison of two ophthalmic solutions: physiological serum and Diphoterine]. [French]. Journal Francais d Ophthalmologie. 2000 May; 23(5):449-58.	N	N	N	JN LW DT					Foreign
pH1-12	12. Amshel, C. E.; Fealk, M. H.; Phillips, B. J., and Caruso, D. M. (Department of Surgery, Maricopa Medical Center, Phoenix, AZ 85008, USA). Anhydrous ammonia burns case report and review of the literature. [Review] [13 refs]. Burns. 2000 Aug; 26(5):493-7.	Y	Y	N	JN LW DT	Y	N	N	JN LW DT HV	Treatment recommendations w/o comparison of outcomes
pH1-13	13. Sheu, B. S.; Chi, C. H.; Yang, H. B.; Jen, C. M., and Lin, X. Z. (Department of Internal Medicine, National Cheng Kung University Hospital, Tainan, Taiwan. sheubs@mail.ncku.edu.tw). A three-day course of intravenous omeprazole plus antibiotics for H. pylori-positive bleeding duodenal ulcer. Hepato-Gastroenterology. 1999 Jul-1999 Aug 31; 46(28):2363-71.	N	N	N	JN LW DT					Pull for Question 2

pH1-14	14. Barnes, A. R. and Nash, S. (Pharmaceutical Sciences Institute, Aston University, Birmingham, UK. abarnes@dmu.ac.uk). Stability of ceftazidime in a viscous eye drop formulation. Journal of Clinical Pharmacy & Therapeutics. 1999 Aug; 24(4):299-302.	N	N	N	JN LW DT					
pH1-15	15. Ramos Carrasco, A.; Hyat Inurrieta, L.; Perez Contin, M. J.; Calderon Duque, T.; Aparicio Medrano, C.; Duran Gimenez-Rico, H. J.; Martinez Sarmiento, J., and Alvarez Fernandez-Represa, J. (Servicio de Cirugia I, Hospital Universitario San Carlos, Madrid, Espana). Value of tonometry in postoperative high risk patients with digestive surgery. Revista Espanola De Enfermedades Digestivas. 1999 Feb; 91(2):117-24.	N	N	N	JN LW DT					pH by tonometry
pH1-16	16. Abakumov, M. M.; Kostiuchenko, L. N., and Kudriashova, N. E. [Enteral infusion-nutritional correction of homeostasis in patients with postburn cicatricial stenosis of the esophagus and stomach]. [Russian]. Vestnik Khirurgii Imeni i - i - Grekova. 1999; 158(5):30-30.	N	N	N	JN LW DT					Foreign
pH1-17	17. Woolf, A. D. and Shaw, J. S. (Children's Hospital, Boston, Massachusetts 02115, USA. woolf@a1.tch.harvard.edu). Nail primer cosmetics: correlations between product pH and adequacy of labeling. Journal of Toxicology - Clinical Toxicology. 1999; 37(7):827-32.	N	N	N	JN LW DT					

pH1-18	18. Gerard, M.; Louis, V.; Merle, H.; Josset, P.; Menerath, J. M., and Blomet, J. (Service d'Ophthalmologie, Centre Hospitalier Universitaire de Fort de France, Hopital Pierre Zobda Quitman, BP 632, 97261 Fort de France Cedex). [Experimental study about intra-ocular penetration of ammonia]. [French]. Journal Francais d Ophthalmologie. 1999 Dec; 22(10):1047-53.	N	N	N	JN LW DT					Foreign
pH1-19	19. Gerard, M.; Merle, H.; Ayeboua, L., and Richer, R. (Service d'Ophthalmologie, Centre Hospitalier Universitaire de Fort de France, Hopital Pierre Zobda-Quitman, Martinique French West Indies). [Prospective study of eye burns at the Fort de France University Hospital]. [French]. Journal Francais d Ophthalmologie. 1999 Oct; 22(8):834-47.	N	N	N	JN LW DT					Foreign
pH1-20	20. Reitz, C.; Breipohl, W.; Augustin, A., and Bours, J. (Institute for Experimental Ophthalmology, University of Bonn, Germany). Analysis of tear proteins by one- and two-dimensional thin-layer isoelectric focusing, sodium dodecyl sulfate electrophoresis and lectin blotting. Detection of a new component: cystatin C. Graefes Archive for Clinical & Experimental Ophthalmology. 1998 Dec; 236(12):894-9.	N	N	N	JN LW DT					
pH1-21	21. Yamada, M.; Kawai, M.; Mochizuki, H.; Hata, Y., and Mashima, Y. (Department of Ophthalmology, Keio University School of Medicine, Tokyo, Japan. yamadam@med.keio.ac.jp). Fluorophotometric measurement of the buffering action of human tears in vivo. Current Eye Research. 1998 Oct; 17(10):1005-9.	N	N	N	JN LW DT					Fluorometric pH

pH1-22	22. Gasyimov, O. K.; Abduragimov, A. R.; Yusifov, T. N., and Glasgow, B. J. (Departments of Pathology and Ophthalmology, UCLA School of Medicine, 100 Stein Plaza, Los Angeles, CA 90095, USA). Structural changes in human tear lipocalins associated with lipid binding. <i>Biochimica Et Biophysica Acta</i> . 1998 Jul 28; 1386(1):145-56.	N	N	N	JN LW DT					
pH1-23	23. McNamara, N. A.; Polse, K. A., and Bonanno, J. A. (Morton D. Sarver Laboratory for Cornea & Contact Lens Research, University of California, Berkeley, USA). Fluorophotometry in contact lens research: the next step. <i>Optometry & Vision Science</i> . 1998 May; 75(5):316-22.	N	N	N	JN LW DT					Fluorometric pH
pH1-24	24. Yamataka, A.; Pringle, K. C., and Wyeth, J. (Department of Surgery, Wellington School of Medicine, New Zealand). A case of zinc chloride ingestion. <i>Journal of Pediatric Surgery</i> . 1998 Apr; 33(4):660-2.	N	N	N	JN LW DT					
pH1-25	25. Gonul, B.; Erdogan, D.; Bilgihan, K., and Ozogul, C. (Gazi University, Faculty of Medicine, Department of Physiology, Histology, Abkara, Turkey). The effects of artificial tear solutions on wound healing in full thickness corneal incisions. <i>Acta Physiologica Hungarica</i> . 1997; 85(3):251-8.	N	N	N	JN LW DT					
pH1-26	26. Molloy, M. P.; Bolis, S.; Herbert, B. R.; Ou, K.; Tyler, M. I.; van Dyk, D. D.; Willcox, M. D.; Gooley, A. A.; Williams, K. L.; Morris, C. A., and Walsh, B. J. (Australian Proteome Analysis Facility, Macquarie University, Sydney). Establishment of the human reflex tear two-dimensional polyacrylamide gel electrophoresis reference map: new proteins of potential diagnostic value. <i>Electrophoresis</i> . 1997 Dec; 18(15):2811-5.	N	N	N	JN LW DT					

pH1-27	27. Varnell, R. J.; Maitchouk, D. Y.; Beuerman, R. W.; Salvatore, M. F.; Carlton, J. E., and Haag, A. M. (Department of Ophthalmology, Louisiana State University Medical Center School of Medicine, New Orleans, USA). Analysis of rabbit tear fluid using capillary electrophoresis with UV or laser-induced fluorescence detection. <i>Journal of Capillary Electrophoresis</i> . 1997 Jan-1997 Feb 28; 4(1):1-6.	N	N	N	JN LW DT					
pH1-28	28. Beiran, I.; Miller, B., and Bentur, Y. (Department of Ophthalmology, Rambam Medical Center, Bruce Rappaport Faculty of Medicine, Technion, Israel Institute of Technology, Haifa, Israel). The efficacy of calcium gluconate in ocular hydrofluoric acid burns. <i>Human & Experimental Toxicology</i> . 1997 Apr; 16(4):223-8.	Y	N	N	JN LW DT	Y	N	N	JN LW DT HV	pH measured before and after burn and irrigation with pH paper in rabbits
pH1-29	29. Yamada, M.; Mochizuki, H.; Kawai, M.; Yoshino, M., and Mashima, Y. (Department of Ophthalmology, Keio University School of Medicine, Tokyo, Japan). Fluorophotometric measurement of pH of human tears in vivo. <i>Current Eye Research</i> . 1997 May; 16(5):482-6.	N	N	N	JN LW DT					Fluorometric pH
pH1-30	30. McConville, P.; Pope, J. M., and Huff, J. W. (School of Physics and Cornea and Contact Lens Research Unit, University of New South Wales, Sydney, Australia). Limitations of in vitro contact lens dehydration/rehydration data in predicting on-eye dehydration. <i>CLAO Journal</i> . 1997 Apr; 23(2):117-21.	N	N	N	JN LW DT					Mathematical model
pH1-31	31. Mrvos, R. and Krenzelok, E. P. Hair relaxers: lack of morbidity despite high pH. <i>American Journal of Emergency Medicine</i> . 1997 Mar; 15(2):216.	N	Y	N	JN LW DT	N	N	N	JN LW DT HV	No outcomes

pH1-32	32. Maudgal, P. C. (Ophthalmological Clinic, U.Z. Leuven). Ocular burn caused by soft brown soap. Bulletin De La Societe Belge d Ophthalmologie. 263:81-4, 1996.	N	Y	N	JN LW DT	N	N	N	JN LW DT HV	No outcomes
pH1-33	33. Simon, M.; Coiffard, L. J.; Rivalland, P., and De Roeck-Holtzhauer, Y. (Laboratoire de Pharmacie industrielle et Cosmetologie, Universite de Nantes-CAEC, Saint-Herblain). [Determination of physicochemical characteristics and evaluation of decontaminating efficacy and in vitro safety of cleaning products for contact lenses]. [French]. Journal Francais d Ophthalmologie. 1996; 19(12):738-42.	N	N	N	JN LW DT					Foreign
pH1-34	34. Sack, R. A.; Sathe, S.; Hackworth, L. A.; Willcox, M. D.; Holden, B. A., and Morris, C. A. (Department of Biological Sciences, State College of Optometry, State University of New York, NY 10010, USA). The effect of eye closure on protein and complement deposition on Group IV hydrogel contact lenses: relationship to tear flow dynamics. Current Eye Research. 1996 Nov; 15(11):1092-100.	N	N	N	JN LW DT					
pH1-35	35. Bautista, A.; Varela, R.; Villanueva, A.; Estevez, E.; Tojo, R., and Cadranel, S. (Departamento de Pediatria, Hospital General de Galicia, Clinico Universitario, Universidad de Santiago, Santiago de Compostela, La Coruna, Spain). Motor function of the esophagus after caustic burn. European Journal of Pediatric Surgery. 1996 Aug; 6(4):204-7.	N	Y	N	JN LW DT	N	N	Y	JN LW DT HV	Pull for Question 2; No pH paper used, pH monitor

pH1-36	36. Dickinson, D. P. and Thiesse, M. (University of Texas, Houston Health Science Center, Department of Basic Sciences 77225, USA). cDNA cloning of an abundant human lacrimal gland mRNA encoding a novel tear protein. Current Eye Research. 1996 Apr; 15(4):377-86.	N	N	N	JN LW DT					
pH1-37	37. Yano, K.; Hosokawa, K.; Kakibuchi, M.; Hikasa, H., and Hata, Y. (Department of Dermatology, Osaka University School of Medicine, Japan). Effects of washing acid injuries to the skin with water: an experimental study using rats. Burns. 1995 Nov; 21(7):500-2.	Y	Y	N	JN LW DT	N	N	Y	JN LW DT HV	Continuous pH microelectrode under skin – pH paper not used. Rats
pH1-38	38. Katsu, K. and Yabe, S. (Third Division of Internal Medicine, Saitama Medical School, Japan). Comparison of gastric mucosal surface pH response times after intravenous administration of histamine2-receptor antagonists. Clinical Therapeutics. 1995 May-1995 Jun 30; 17(3):433-10.	N	N	N	JN LW DT					Pull for Question 2 Endoscopic pH
pH1-39	39. Tripathi, A.; Somwanshi, M.; Singh, B., and Bajaj, P. (Department of Anaesthesiology, R.N.T. Medical College and Associated Hospitals, Udaipur, India). A comparison of intravenous ranitidine and omeprazole on gastric volume and pH in women undergoing emergency caesarean section.[comment]. Canadian Journal of Anaesthesia. 1995 Sep; 42(9):797-800.	N	N	N	JN LW DT					Pull for Question 2

pH1-40	40. Baguet, J.; Claudon-Eyl, V.; Sommer, F., and Chevallier, P. (Laboratoire Meuse Optique Contact, Bar le Duc, Biophy Research, Novacite Alpha, Villeurbanne, LPAN Universite Pierre et Marie Curie, Orsay, France). Normal protein and glycoprotein profiles of reflex tears and trace element composition of basal tears from heavy and slight deposits on soft contact lenses. CLAO Journal. 1995 Apr; 21(2):114-21.	N	N	N	JN LW DT					
pH1-41	41. Coiffard, L.; Rivalland, P., and De Roeck-Holtzhauer, Y. (Laboratoire de Pharmacie Industrielle et Cosmetique, Universite de Nantes-CAEC). [Characteristics, stability and in vitro efficacy of cleaning products for contact lenses]. [French]. Journal Francais d Ophthalmologie. 1995; 18(1):33-9.	N	N	N	JN LW DT					Foreign
pH1-42	42. Kahanne, L. I.; Bogi, J.; Farkas, A.; Tudos, F. H., and Imre, G. (SOTE II. sz. Szemklinika, Budapest). [Indosol--a nonsteroidal anti-inflammatory drug with therapeutic efficacy]. [Hungarian]. Acta Pharmaceutica Hungarica. 1994 Jul; 64(4):125-9.	N	N	N	JN LW DT					Foreign
pH1-43	43. Su, J. M.; Hsu, H. K.; Chang, H. C., and Hsu, W. H. (Department of Surgery, Veterans General Hospital-Kaohsiung, Taipei, Taiwan, R.O.C). Management for acute corrosive injury of upper gastrointestinal tract. Chung Hua i Hsueh Tsa Chih - Chinese Medical Journal. 1994 Jul; 54(1):20-5.	N	N	N	JN LW DT					Pull for Question 2
pH1-44	44. Yano, K.; Hata, Y.; Matsuka, K.; Ito, O., and Matsuda, H. (Department of Plastic and Reconstructive Surgery, Kagawa Medical School, Japan). Effects of washing with a neutralizing agent on alkaline skin injuries in an experimental model. Burns. 1994 Feb; 20(1):36-9.	Y	Y	N	JN LW DT	N	N	Y	JN LW DT HV	Rats subcutaneous pH monitoring. pH paper not used.

pH1-45	45. --- (Department of Plastic and Reconstructive Surgery, Kagawa Medical School, Japan). Experimental study on alkaline skin injuries--periodic changes in subcutaneous tissue pH and the effects exerted by washing. Burns. 1993 Aug; 19(4):320-3.	Y	Y	N	JN LW DT	N	N	Y	JN LW DT HV	Rats subcutaneous pH monitoring. PH paper not used.
pH1-46	46. Paredes Osado, J. R.; Gras Albert, J. R.; Crespo Marco, C., and Mira Navarro, J. (Servicio de ORL, Hospital General d'Alacant (SVS)). [Our experience with caustic substance ingestion in children]. [Spanish]. Acta Otorrinolaringologica Espanola. 1993 Mar-1993 Apr 30; 44(2):101-5.	N	N	N	JN LW DT					Foreign
pH1-47	47. Rout, C. C.; Rocke, D. A., and Gouws, E. (Department of Anaesthetics, University of Natal, Durban, South Africa). Intravenous ranitidine reduces the risk of acid aspiration of gastric contents at emergency cesarean section.[erratum appears in Anesth Analg 1993 May;76(5):1180]. Anesthesia & Analgesia. 1993 Jan; 76(1):156-61.	Y	N	N	JN LW DT	N	N	N	JN LW DT HV	pH electrode of stomach contents. pH paper not used.
pH1-48	48. Norn, M. (Eye Department, Hvidovre Hospital, University of Copenhagen, Denmark). Sampling methods for tear stix tests. Acta Ophthalmologica. 1992 Dec; 70(6):754-7.	Y	N	N	JN LW DT	N	N	N	JN LW DT HV	Urine dipsticks used – No outcomes compared, sampling technique differences
pH1-49	49. Papadimitriou, L.; Kandiloros, A.; Lakiotis, K., and Vlontzos, M. (Department of Anaesthesiology, Evangelismos hospital, Athens, Greece). Protecting against the acid aspiration syndrome in adult patients undergoing emergency surgery. Hepato-Gastroenterology. 1992 Dec; 39(6):560-1.	Y	N	N	JN LW DT	N	N	N	JN LW DT HV	pH meter of gastric contents

pH1-50	50. Baguet, J.; Claudon-Eyl, V., and Gachon, A. M. (Laboratoire Meuse Optique Contact (MOC), Centre Hospitalier, Bar le Duc, France). Tear protein G originates from denatured tear specific prealbumin as revealed by two-dimensional electrophoresis. Current Eye Research. 1992 Nov; 11(11):1057-65.	N	N	N	JN LW DT					
pH1-51	51. Walgenbach, S. and Junginger, T. (Klinik und Poliklinik für Allgemein- und Abdominalchirurgie, Johannes-Gutenberg-Universität Mainz). [Results of stomach resection with Roux gastrojejunostomy for gastroduodenal ulcers]. [German]. Chirurg. 1992 Jun; 63(6):511-5.	N	N	N	JN LW DT					Foreign
pH1-52	52. Cejkova, J.; Lojda, Z.; Vacik, J.; Digenis, G. A., and Dropcova, S. (Institute of Experimental Medicine, Czechoslovak Academy of Sciences, Praha, CSFR). Histochemical changes in the rabbit cornea and plasmin activity in the tear fluid during contact lens wear. Favourable influence of protease inhibitors (aprotinin, PC5, elastatinal). Histochemistry. 1992; 97(1):69-76.	N	N	N	JN LW DT					
pH1-53	53. Gorman, R. L.; Khin-Maung-Gyi, M. T.; Klein-Schwartz, W.; Oderda, G. M.; Benson, B.; Litovitz, T.; McCormick, M.; McElwee, N.; Spiller, H., and Krenzelok, E. (Maryland Poison Center, Baltimore 21201). Initial symptoms as predictors of esophageal injury in alkaline corrosive ingestions. American Journal of Emergency Medicine. 1992 May; 10(3):189-94.	Y	Y	N	JN LW DT	N	N	N	JN LW DT HV	pH paper not used – compared symptoms to esophageal injury and product ph ingested
pH1-54	54. Winemaker, M.; Douglas, L., and Peters, W. (Ross Tilley Burn Centre, Wellesley Hospital, Toronto, Canada). Combination alkali/thermal burns caused by 'black liquor' in the pulp and paper industry. Burns. 1992 Feb; 18(1):68-70.	Y	Y	Y	JN LW DT	N	N	N	JN LW DT HV	PH paper not used – case description

pH1-55	55. Lim, S. K. and Elegbe, E. O. (Department of Anaesthesiology, Faculty of Medicine, Universiti Kebangsaan Malaysia, Jalan Raja Muda, Kuala Lumpur). The use of single dose of sodium citrate as a prophylaxis against acid aspiration syndrome in obstetric patients undergoing caesarean section. Medical Journal of Malaysia. 1991 Dec; 46(4):349-55.	Y	N	N	JN LW DT	N	N	N	JN LW DT HV	Gastric contents by pH meter. Ph paper not used.
pH1-56	56. Yildirim, N.; Topbas, S.; Usluer, G.; Ozgunes, I.; Basmak, H., and Yurdakul, S. (Anadolu Universitesi, Tip Fakultesi, Goz Hastaliklari Anabilim Dalı Ogretim Uyesi). [Stability of cefazolin sodium as eyedrops in various solutions]. [Turkish]. Mikrobiyoloji Bulteni. 1991 Jul; 25(3):272-6.	N	N	N	JN LW DT					Foreign
pH1-57	57. Janda, A. M. (Hennepin County Medical Center, Department of Ophthalmology, Minneapolis, MN 55415). Ocular trauma. Triage and treatment. Postgraduate Medicine. 1955 Nov 15-1960 Nov 15; 90(7):51-2.	Y	Y	N	JN LW DT	Y	N	Y	JN LW DT HV	Treatment recommendations without outcomes
pH1-58	58. Adamek, H. E.; Weber, J.; Benz, C., and Riemann, J. F. (Medizinische Klinik, Klinikum der Stadt Ludwigshafen). [Lye corrosion of the esophagus. Course under long-term bougienage]. [German]. Deutsche Medizinische Wochenschrift. 1991 Nov 2; 116(44):1664-9.	N	Y	N	JN LW DT	N		N	JN LW DT HV	Foreign
pH1-59	59. Howell, J. M. (North East Ohio Universities College of Medicine, Akron, OH). Alkalinity of non-industrial cleaning products and the likelihood of producing significant esophageal burns. American Journal of Emergency Medicine. 1991 Nov; 9(6):560-2.	N	N	N	JN LW DT					

pH1-60	60. Hugh, T. B.; Meagher, A. P., and Li, B. (Department of Surgery, St. Vincent's Hospital, Sydney, Australia). Gastric antral patch esophagoplasty for extensive corrosive stricture of the esophagus. World Journal of Surgery. 303 Mar-303 Apr 30; 15(2):299-303.	N	N	N	JN LW DT					Pull for Question 2
pH1-61	61. Khurana, A. K.; Chaudhary, R.; Ahluwalia, B. K., and Gupta, S. (Department of Ophthalmology-II, Medical College, Rohtak (Haryana), India). Tear film profile in dry eye. Acta Ophthalmologica. 1991 Feb; 69(1):79-86.	Y	N	N	JN LW DT	Y	N	N	JN LW DT HV	pH doesn't have a role in diagnosis of dry eye state
pH1-62	62. Herr, R. D.; White, G. L. Jr; Bernhisel, K.; Mamalis, N., and Swanson, E. (Department of Surgery, University of Utah Medical School, Salt Lake City). Clinical comparison of ocular irrigation fluids following chemical injury. American Journal of Emergency Medicine. 1991 May; 9(3):228-31.	Y	Y	N	JN LW DT	Y	N	Y	JN LW DT HV	Use of ph paper to measure pH of eye after 4 different irrigation fluids.
pH1-63	63. McCulley, J. P. (Southwestern Medical Center, Dallas, Texas). Ocular hydrofluoric acid burns: animal model, mechanism of injury and therapy. Transactions of the American Ophthalmological Society. 88:649-84, 1990.	N	N	N	JN LW DT					
pH1-64	64. Rieger, G. (Ophthalmic Department of the Paracelsus Institute, Bad Hall, Austria). Lipid-containing eye drops: a step closer to natural tears.[comment]. Ophthalmologica. 1990; 201(4):206-12.	N	N	N	JN LW DT					

pH1-65	65. Ormezzano, X.; Ganansia, M. F.; Arnould, J. F.; Gregoire, F. M.; Wessel, P. E.; Bourgeonneau, M. C.; Bukowski, J. C.; Grinand, M. R.; Viaud, J. Y., and N'Guyen, N. Q. (Service d'Anesthesiologie, Centres Hospitaliers Generaux de Saint-Nazaire, Nantes). [Prevention of aspiration pneumonia in obstetrical anesthesia with the effervescent combination of cimetidine and sodium citrate]. [French]. Annales Francaises d Anesthesie Et De Reanimation. 1990; 9(3):285-8.	N	N	N	JN LW DT					Foreign
pH1-66	66. Ormezzano, X.; Francois, T. P.; Viaud, J. Y.; Bukowski, J. G.; Bourgeonneau, M. C.; Cottron, D.; Ganansia, M. F.; Gregoire, F. M.; Grinand, M. R., and Wessel, P. E. (Departement d'Anesthesie, Centre Hospitalier de Saint Nazaire, France). Aspiration pneumonitis prophylaxis in obstetric anaesthesia: comparison of effervescent cimetidine-sodium citrate mixture and sodium citrate. BJA: British Journal of Anaesthesia. 1990 Apr; 64(4):503-6.	Y	N	N	JN LW DT	N	N	N	JN LW DT HV	Gastric contents measured by pH meter
pH1-67	67. Chen, F. S. and Maurice, D. M. (Department of Ophthalmology, Stanford University Medical Center, CA 94305). The pH in the precorneal tear film and under a contact lens measured with a fluorescent probe. Experimental Eye Research. 1990 Mar; 50(3):251-9.	N	N	N	JN LW DT					Fluorometric pH
pH1-68	68. Gallagher, E. J.; Schwartz, E., and Weinstein, R. S. (Emergency Medical Services, Bronx Municipal Hospital Center, NY 10461). Performance characteristics of urine dipsticks stored in open containers. American Journal of Emergency Medicine. 1990 Mar; 8(2):121-3.	N	N	N	JN LW DT					pH on urine dipsticks

pH1-69	69. Sheppard, J. D.; Orenstein, D. M.; Chao, C. C.; Butala, S., and Kowalski, R. P. (Department of Ophthalmology, University of Pittsburgh School of Medicine, Children's Hospital of Pittsburgh). The ocular surface in cystic fibrosis. <i>Ophthalmology</i> . 1989 Nov; 96(11):1624-30.	Y	N	N	JN LW DT	N	N	N	JN LW DT HV	No outcomes
pH1-70	70. Hoffman, R. S.; Howland, M. A.; Kamerow, H. N., and Goldfrank, L. R. (New York City Poison Control Center, N.Y. 10016). Comparison of titratable acid/alkaline reserve and pH in potentially caustic household products. <i>Journal of Toxicology - Clinical Toxicology</i> . 1989; 27(4-5):241-6.	Y	N	N	JN LW DT	N	N	N	JN LW DT HV	pH meter. No ph paper used.
pH1-71	71. Usui, Y.; Matsukawa, M.; Hamada, T.; Watanabe, H.; Kondo, K.; Kitamura, S.; Kuwabara, N., and Shirakabe, H. (Department of Gastroenterology, Juntendo University School of Medicine, Tokyo, Japan). Corrosive gastritis mimicking linitis plastica carcinoma. <i>Gastroenterologia Japonica</i> . 1989 Aug; 24(4):398-401.	N	N	N	JN LW DT					
pH1-72	72. Burns, F. R. and Paterson, C. A. (Kentucky Lions Eye Research Institute, University of Louisville). Prompt irrigation of chemical eye injuries may avert severe damage. <i>Occupational Health & Safety</i> . 1989 Apr; 58(4):33-6.	Y	Y	Y	JN LW DT	Y	N	Y	JN LW DT HV	No outcomes but mention use of ph paper is generally accepted for eye irrigation
pH1-73	73. Manevich, V. L.; Kharitonov, L. G., and Sonts, G. M. [Functional status of the operated-on stomach in patients with post-burn esophageal stenosis]. [Russian]. <i>Khirurgiia</i> . 1989 Mar; (3):79-83.	N	N	N	JN LW DT					Foreign

pH1-74	74. Kuster, M.; Naji, P.; Gabi, K., and Kreienbuhl, G. (Institut für Anaesthesie und Intensivmedizin, Kantonsspital St. Gallen). [Intraoperative, direct and continuous measurement of stomach pH following pretreatment with ranitidine or sodium citrate]. [German]. Anaesthesist. 1989 Feb; 38(2):59-64.	N	N	N	JN LW DT					Foreign
pH1-75	75. Fassihi, A. R. and Naidoo, N. T. (Department of Pharmacy, University of the Witwatersrand, Johannesburg). Irritation associated with tear-replacement ophthalmic drops. A pharmaceutical and subjective investigation. South African Medical Journal. 1989 Mar 4; 75(5):233-5.	N	N	N	JN LW DT					
pH1-76	76. Bikfalvi, A.; Dupuy, E.; Inyang, A. L.; Fayein, N.; Leseche, G.; Courtois, Y., and Tobelem, G. (INSERM U 150, Hopital Lariboisiere, Paris, France). Binding, internalization, and degradation of basic fibroblast growth factor in human microvascular endothelial cells. Experimental Cell Research. 1989 Mar; 181(1):75-84.	N	N	N	JN LW DT					
pH1-77	77. Norn, M. S. (Eye Department, Hvidovre Hospital, University of Copenhagen, Denmark). Tear fluid pH in normals, contact lens wearers, and pathological cases. Acta Ophthalmologica. 1988 Oct; 66(5):485-9.	N	N	N	JN LW DT					Microelectrode pH
pH1-78	78. Colman, R. D.; Frank, M.; Loughnan, B. A.; Cohen, D. G., and Cattermole, R. (Department of Anaesthetics, Westmead Hospital, Sydney, Australia). Use of i.m. ranitidine for the prophylaxis of aspiration pneumonitis in obstetrics. BJA: British Journal of Anaesthesia. 1988 Dec; 61(6):720-9.	Y	N	N	JN LW DT	N	N	N	JN LW DT HV	pH meter

pH1-79	79. Kovanev, A. V.; Sinev, I. u. V.; Novosel'tseva, S. A.; Mironov, A. V., and Il'iashenko, K. K. [Use of the endoscopic pH-metry method in patients with chemical burns of the esophagus]. [Russian]. Grudnaia Khirurgiia. 1988 Jul-1988 Aug 31; (4):71-5.	N	N	N	JN LW DT					Foreign
pH1-80	80. Pike, J.; Patterson, A. Jr, and Arons, M. S. (Plastic Surgery Services, Yale-New Haven Hospital, Connecticut). Chemistry of cement burns: pathogenesis and treatment. Journal of Burn Care & Rehabilitation. 1988 May-1988 Jun 30; 9(3):258-60.	N	N	N	JN LW DT					
pH1-81	81. Lorette, J. J. Jr and Wilkinson, J. A. (Department of Emergency Medicine, Tripler Army Medical Center, Honolulu, Hawaii 96859). Alkaline chemical burn to the face requiring full-thickness skin grafting.[comment]. Annals of Emergency Medicine. 1988 Jul; 17(7):739-41.	Y	Y	N	JN LW DT	N	N	Y	JN LW DT HV	pH skin management in ED. But reference 13 pulled, as Medline search only went back to 1966.
pH1-82	82. Bonanno, J. A. and Polse, K. A. Corneal acidosis during contact lens wear: effects of hypoxia and CO2. Investigative Ophthalmology & Visual Science. 1987 Sep; 28(9):1514-20.	N	N	N	JN LW DT					Fluorometric pH
pH1-83	83. Thygesen, J. E. and Jensen, O. L. pH changes of the tear fluid in the conjunctival sac during postoperative inflammation of the human eye. Acta Ophthalmologica. 1987 Apr; 65(2):134-6.	Y	N	N	JN LW DT	N	N	N	JN LW DT HV	Used pH meter, no outcomes
pH1-84	84. Coyle, P. K.; Sibony, P., and Johnson, C. Oligoclonal IgG in tears. Neurology. 1987 May; 37(5):853-6.	N	N	N	JN LW DT					

pH1-85	85. Lewandowska-Furmanikowa, M. [Experimental studies of the effect of subconjunctival administration of ascorbic acid on changes in pH, pO ₂ and pCO ₂ of the aqueous humor of the rabbit eye after corneal burn with alkaline solution]. [Polish]. Klinika Oczna. 1986 Aug; 88(8):269-72.	N	N	N	JN LW DT					Foreign
pH1-86	86. Mathews, H. M.; Wilson, C. M.; Thompson, E. M., and Moore, J. Combination treatment with ranitidine and sodium bicarbonate prior to obstetric anaesthesia. Anaesthesia. 1986 Dec; 41(12):1202-6.	Y	N	N	JN LW DT	N	N	N	JN LW DT HV	No pH paper used pH meter
pH1-87	87. Chien, D. S. and Schoenwald, R. D. Improving the ocular absorption of phenylephrine. Biopharmaceutics & Drug Disposition. 1986 Sep-1986 Oct 31; 7(5):453-62.	N	N	N	JN LW DT					
pH1-88	88. Yasui, T. Hazardous effects due to alkaline button battery ingestion: an experimental study. Annals of Emergency Medicine. 1986 Aug; 15(8):901-6.	Y	N	N	JN LW DT	N	N	N	JN LW DT HV	Ph paper of rat mucosa with implanted batteries, no outcomes
pH1-89	89. Lacouture, P. G.; Gaudreault, P., and Lovejoy, F. H. Jr. Clinitest tablet ingestion: an in vitro investigation concerned with initial emergency management. Annals of Emergency Medicine. 1986 Feb; 15(2):143-6.	N	Y	N	JN LW DT	N	N	N	JN LW DT HV	pH meter, no ph paper used
pH1-90	90. Norn, M. Tear pH after instillation of buffer in vivo. Acta Ophthalmologica - Supplementum. 173:32-4, 1985.	N	N	N	JN LW DT					Microelectrode pH

pH1-91	91. Urtti, A. and Salminen, L. Concentration-dependent precorneal loss of pilocarpine in rabbit eyes. Acta Ophthalmologica. 1985 Oct; 63(5):502-6.	N	N	N	JN LW DT					Foreign
pH1-92	92. Sigrist, T. and Flury, K. [Death by peroral ingestion of soluble glass (sodium silicate)]. [German]. Zeitschrift Fur Rechtsmedizin - Journal of Legal Medicine. 1985; 94(3):245-50.	N	N	N	JN LW DT					
pH1-93	93. Gachon, A. M.; Bilbaut, T., and Dastugue, B. Adsorption of tear proteins on soft contact lenses. Experimental Eye Research. 1985 Jan; 40(1):105-16.	N	N	N	JN LW DT					
pH1-94	94. Flynn, W. J.; Mauger, T. F., and Hill, R. M. Corneal burns: a quantitative comparison of acid and base. Acta Ophthalmologica. 1984 Aug; 62(4):542-8.	N	N	Y	JN LW DT	N	N	Y	JN LW DT HV	pH not measured
pH1-95	95. Basu, P. K.; Avaria, M.; Cutz, A., and Chipman, M. Ocular effects of water from acidic lakes: an experimental study. Canadian Journal of Ophthalmology. 1984 Apr; 19(3):134-41.	N	N	N	JN LW DT					
pH1-96	96. McAuley, D. M.; Moore, J.; Dundee, J. W., and McCaughey, W. Oral ranitidine in labour. Anaesthesia. 1984 May; 39(5):433-8.	Y	N	N	JN LW DT	N	N	N	JN LW DT HV	? how pH was measured, but gastric content pH correlated with H2 blocker blood concentration
pH1-97	97. Conrads, H.; Winterhoff, D., and Strotmann, U. [Pros and cons of preservatives in eyedrops. Questionnaire for practitioners and experimental studies with reference to the requirements of the German Pharmacopoeia of August 1978]. [German]. Klinische Monatsblätter Fur Augenheilkunde. 1984 Mar; 184(3):233-7.	N	N	N	JN LW DT					Foreign

pH1-98	98. Peters, W. J. Alkali burns from wet cement. Canadian Medical Association Journal. 1984 Apr 1; 130(7):902-4.	N	N	N	JN LW DT					
pH1-99	99. Chen, C. T.; Toung, T. J.; Haupt, H. M.; Hutchins, G. M., and Cameron, J. L. Evaluation of the efficacy of Alka-Seltzer Effervescent in gastric acid neutralization. Anesthesia & Analgesia. 1984 Mar; 63(3):325-9.	Y	N	N	JN LW DT	N	N	N	JN LW DT HV	pH paper not used, bu paper indicates potential use of pH to measure aspiration risk under anesthesia
pH1-100	100. Picardi, C.; Cesari, M.; Chiavola, E.; Alessi, G.; Manfroni, P.; Di Giorgio, A., and Cantarini, C. [Results of the surgical treatment of esophageal stenosis caused by caustics: clinical, endoscopic, radiological control and pH measurement]. [Review] [172 refs] [Italian]. Rivista Di Medicina Aeronautica e Spaziale. 1982 Jan-1982 Dec 31; 47(1-4):143-74.	N	N	N	JN LW DT					Foreign
pH1-101	101. Basu, P. K.; Avaria, M., and Hasany, S. M. Effects of acidic lake water on the eye. Canadian Journal of Ophthalmology. 1982 Apr; 17(2):74-8.	N	N	N	JN LW DT					
pH1-102	102. Wrobel, J.; Koh, T. C., and Saunders, J. M. Sodium citrate: an alternative antacid for prophylaxis against aspiration pneumonitis. Anaesthesia & Intensive Care. 1982 May; 10(2):116-9.	Y	N	N	JN LW DT	N	N	N	JN LW DT HV	pH by ph meter
pH1-103	103. Johnston, J. R.; McCaughey, W.; Moore, J., and Dundee, J. W. A field trial of cimetidine as the sole oral antacid in obstetric anaesthesia. Anaesthesia. 1982 Jan; 37(1):33-8.	Y	N	N	JN LW DT	Y	N	N	JN LW DT HV	Ph paper if gastric content < 1 mL

pH1-104	104. Coombs, D. W.; Hooper, D., and Pageau, M. Emergency cimetidine prophylaxis against acid aspiration. <i>Annals of Emergency Medicine</i> . 1982 May; 11(5):252-4.	Y	N	N	JN LW DT	N	N	N	JN LW DT HV	No pH paper used, pH meter
pH1-105	105. Machida, T. A study of intragastric pH in patients with peptic ulcer--with special reference to the clinical significance of basal pH value. <i>Gastroenterologia Japonica</i> . 1981; 16(5):447-58.	N	N	N	JN LW DT					Microelectrode pH
pH1-106	106. Eichler, H. G.; Lenz, K., and Hruby, K. [Accidental ingestion of corrosives by children (author's transl)]. [German]. <i>Padiatrie Und Padologie</i> . 1981; 16(4):489-94.	N	N	N	JN LW DT					Foreign
pH1-107	107. Doroshow, J. H.; Locker, G. Y.; Gaasterland, D. E.; Hubbard, S. P.; Young, R. C., and Myers, C. E. Ocular irritation from high-dose methotrexate therapy: pharmacokinetics of drug in the tear film. <i>Cancer</i> . 1981 Nov 15; 48(10):2158-62.	N	N	N	JN LW DT					
pH1-108	108. Okawada, N.; Mizoguchi, I., and Ishiguro, T. Effects of photochemical air pollution on the human eye--concerning eye irritation, tear lysozyme and tear pH. <i>Nagoya Journal of Medical Science</i> . 1979 Mar; 41(1-4):9-20.	N	N	N	JN LW DT					
pH1-109	109. Carney, L. G. and Hill, R. M. Human tear buffering capacity. <i>Archives of Ophthalmology</i> . 1979 May; 97(5):951-2.	N	N	N	JN LW DT					
pH1-110 (2-119) (4-74)	110. Krenzelok, E. P. and Clinton, J. E. Caustic esophageal and gastric erosion without evidence of oral burns following detergent ingestion. <i>JACEP</i> . 1979 May; 8(5):194-6.	Y	Y	N	JN LW DT	Y	Y	Y	JN LW DT HV	Ph in emergency use

pH1-111	111. Paterson, C. A.; Eakins, K. E.; Paterson, E.; Jenkins, R. M. 2nd, and Ishikawa, R. The ocular hypertensive response following experimental acid burns in the rabbit eye. <i>Investigative Ophthalmology & Visual Science</i> . 1979 Jan; 18(1):67-74.	N	N	N	JN LW DT					
pH1-112	112. Ancona Alayon and Aranda Martinez, J. G. [Ulcerative contact dermatitis caused by premixed concrete (cement burns)]. [Spanish]. <i>Medicina Cutanea Ibero-Latino-Americana</i> . 1978; 6(3-4):209-12.	N	N	N	JN LW DT					Foreign
pH1-113	113. Wynne, J. W. and Modell, J. H. Respiratory aspiration of stomach contents. [Review] [88 refs]. <i>Annals of Internal Medicine</i> . 1977 Oct; 87(4):466-74.	Y	N	N	JN LW DT	Y	N		JN LW DT HV	Review of pt management may be of use
pH1-114	114. Hill, R. M. and Carney, L. G. The closed eye environment: pH. <i>American Journal of Optometry & Physiological Optics</i> . 1976 Nov; 53(11):718-9.	N	N	N	JN LW DT					
pH1-115	115. Longwell, A.; Birss, S.; Keller, N., and Moore, D. Effect of topically applied pilocarpine on tear film pH. <i>Journal of Pharmaceutical Sciences</i> . 1976 Nov; 65(11):1654-7.	N	N	N	JN LW DT					
pH1-116	116. Carney, L. G. and Hill, R. M. Other hydrophilic lens environments: pH. <i>American Journal of Optometry & Physiological Optics</i> . 1976 Sep; 53(9 Pt 1):456-8.	N	N	N	JN LW DT					
pH1-117	117. ---. Human tear pH. Diurnal variations. <i>Archives of Ophthalmology</i> . 1976 May; 94(5):821-4.	N	N	N	JN LW DT					Microelectrode pH

pH1-118	118. Cejkova, J.; Lojda, Z.; Obenberger, J., and Havrankova, E. Alkali burns of the rabbit cornea. II. A histochemical study of glycosaminoglycans. Histochemistry. 1975 Sep 7; 45(1):71-5.	N	N	N	JN LW DT					
pH1-119	119. Laux, U.; Roth, H. W.; Krey, H., and Steinhardt, B. [Aqueous humor pH in experimental lye burns and influence of different treatment measures (author's transl)]. [German]. Albrecht Von Graefes Archiv Fur Klinische Und Experimentelle Ophthalmologie. 1975; 195(1):33-40.	N	N	N	JN LW DT					Foreign
pH1-120	120. Paterson, C. A.; Pfister, R. R., and Levinson, R. A. Aqueous humor pH changes after experimental alkali burns. American Journal of Ophthalmology. 1975 Mar; 79(3):414-9.	N	N	N	JN LW DT					
pH1-121	121. Smith, R. S. and Shear, G. Corneal alkali burns arising from accidental instillation of a hair straightener. American Journal of Ophthalmology. 1975 Apr; 79(4):602-5.	N	N	N	JN LW DT					
pH1-122	122. Gruber, R. P.; Laub, D. R., and Vistnes, L. M. The effect of hydrotherapy on the clinical course and pH of experimental cutaneous chemical burns. Plastic & Reconstructive Surgery. 1975 Feb; 55(2):200-4.	Y	N	N	JN LW DT	Y	N		JN LW DT HV	pH in burn management
pH1-123	123. Graupner, O. K. [Effect of paracentesis on the change in pH in the anterior chamber of rabbit eyes after experimental burning with acid or base]. [German]. Albrecht Von Graefes Archiv Fur Klinische Und Experimentelle Ophthalmologie. 1973; 186(1):67-72.	N	N	N	JN LW DT					Foreign

pH1-124	124. ---. [Significance of the corneal epithelium for the pH changes in the anterior chamber of the rabbit eye following experimental cautery with acid]. [German]. Albrecht Von Graefes Archiv Fur Klinische Und Experimentelle Ophthalmologie. 1970; 181(1):65-70.	N	N	N	JN LW DT					Foreign
pH1-125	125. Graupner, O. K. and Hausmann, C. M. [The alteration of the pH in the anterior chamber of the rabbit eye burned with smallest volumes of acid and base in concentrations useful in laboratory work]. [German]. Albrecht Von Graefes Archiv Fur Klinische Und Experimentelle Ophthalmologie. 1970; 180(1):60-71.	N	N	N	JN LW DT					Foreign
pH1-126	126. Graupner, O. K. [Changes in the pH value in the anterior chamber of the rabbit eye following corrosion and its influencing by therapeutic procedures]. [German]. Acta Biologica Et Medica Germanica. 1968; 21(6):870-5.	N	N	N	JN LW DT					Foreign
pH1-127	127. Graupner, O. K. and Hausmann, C. M. [The alternation of the pH in the anterior chamber of the rabbits eye burned with smallest volumes of high concentrated acid and base]. [German]. Albrecht Von Graefes Archiv Fur Klinische Und Experimentelle Ophthalmologie. 1968; 176(1):48-53.	N	N	N	JN LW DT					Foreign
pH1-128	128. Fine, K. D. and Schiller, L. R. AGA technical review on the evaluation and management of chronic diarrhea. Gastroenterology 1999 Jun;116(6):1464-86.	Y			JN	N	N	N	JN LW DT HV	AHRQ Guideline search for pH in diarrhea.

**NACB LMPG 2004 Data Abstraction Form
Systematic Review (Data Abstraction Form 1)**

Clinical Question pH-1: Does the use of pH paper to diagnose and monitor treatment of chemical exposure in the ED and Urgent Care patient populations improve length of stay and severity of burn compared to empirical treatment (no monitoring)?

Citation	Design	Application/ Population	N Study/Control	N Evaluated Study/Control	Outcome	Outcome Measureme nt	P value
CA 5 Smith JA et al	RCT	Screening pts (ambulant) in ED	N = 23 walk-in ED Control = 25 outpatient clinic pts	N = 20 ED pts Control N = 25	Length of Stay	Time from admit to discharge	P = 0.03
pH1-2. Schrage, N. F.; Kompa, S.; Haller, W., and Langefeld, S. Use of an amphoteric lavage solution for emergency treatment of eye burns. First animal type experimental clinical considerations. Burns. 2002 Dec; 28(8):782-6.	Double-Blind Study	Rabbit Corneas after exposure to 1 N NaOH	3 rinse slns compared: 1) (N=4) saline and tap water 2) (N=16) Diphoterine (amphoteric sln) 500 mL for 5 min 3) Saline & Diphoterine 5mins (16 days, 3x/day)	Expt 1 N=4 Expt 2 N=16	Proof of pH change on eye using ph meter electrode and pathology of cornea	pH meter change confirmed by pH paper	Diphoterine p<0.05 vs NaCl
pH1-12. Amshel, C. E.; Fealk, M. H.; Phillips, B. J., and Caruso, D. M. Anhydrous ammonia burns case report and review of the literature. [Review] [13 refs]. Burns. 2000 Aug; 26(5):493-7.	Case Report	Anhydrous Ammonia burn	N/a	N=1	N/A	Treatment description	N/A
pH1-28 Beiran, I.; Miller, B., and Bentur, Y. The efficacy of calcium gluconate in ocular hydrofluoric acid burns. Human & Experimental Toxicology. 1997 Apr; 16(4):223-8.	Case control	HF acid eye burn in rabbits	1 (N=10) saline irrigation, topical antibiotic for 48hr 2 (N=9) 1% calcium gluconate irrigation, topical antibiotic for 48 hr 3 (N=10 group 1 w/1% CG drops 4 (N=9) Group 2 w/1% CG drops	N= 9 expt vs N=10 control	Eye	-corneal erosion -corneal clarity -conjunctival status - vascularization - acidity, pH	P=0.22, .002 for erosion day 1 and 2 P<0.05 day 2 to wk 2 for damage

pH1-35. Bautista, A.; Varela, R.; Villanueva, A.; Estevez, E.; Tojo, R., and Cadranel, S. Motor function of the esophagus after caustic burn. European Journal of Pediatric Surgery. 1996 Aug; 6(4):204-7.	Case control	25 children w/ chronic esophagitis after 2 nd and 3 rd degree caustic burns	N=25 children with caustic esophagitis N=12 suspected of GER but ruled out	N=25 expt vs N=12 controls	Esophageal motor function	-manometry -radiology -pH - Tc Scintigraphy	P<0.01 for pH monitors % time <4.0 (19.3 vs 2.3) # of GER (47.7 vs 8.7) # GER >5 min (10.1 vs 1.2) length longest GER (50.8 vs 6.19)
pH1-37. Yano, K.; Hosokawa, K.; Kakibuchi, M.; Hikasa, H., and Hata, Y. Effects of washing acid injuries to the skin with water: an experimental study using rats. Burns. 1995 Nov; 21(7):500-2.	Case Control	20 rats skin acid 1 N HCL injury	N=5 each group 1 untreated 2 500 mL H2O 1 min post 3 H2O at 3 mins post 4 H2O at 10 mins post injury	N=5 experimental vs N = 5 control	Tissue pH Tissue damage	pH meter tissue change over time after exposure	P<0.01 for 1 min P<0.05 for 3 min vs control untreated
pH1-44. Yano, K.; Hata, Y.; Matsuka, K.; Ito, O., and Matsuda, H. Effects of washing with a neutralizing agent on alkaline skin injuries in an experimental model. Burns. 1994 Feb; 20(1):36-9.	Case Control	30 rats skin alkali 2 N NaOH injury	N=5 each group 1- 500 mL H2O at 1 min post 2- H2O at 10 min post 3- H2O at 30 min post 4- citrate at 1 min post 5- citrate at 10 min post 6 – citrate at 30 min post injury	N=5 expt vs N=5 control	Tissue pH Tissue damage	pH meter tissue change after exposure	P < 0.05 citrate vs H2O
pH1-45. --- Experimental study on alkaline skin injuries--periodic changes in subcutaneous tissue pH and the effects exerted by washing. Burns. 1993 Aug; 19(4):320-3.	Case Control	20 rats skin alkali 2 N NaOH injury	N=5 each group 1- untreated 2- 500 mLs H2O at 1 min post 3- H2O at 10 min post 4- H2O at 30 mins post injury	N = 5 expt vs N = 5 control	Tissue pH Tissue damage	Ph meter tissue change after exposure	P<0.05 for water at 1 & 10 mins vs control untreated
pH1-57. Janda, A. M. Ocular trauma. Triage and treatment. Postgraduate Medicine. 1955 Nov 15-1960 Nov 15; 90(7):51-2	Case report	N=3 pts black liquor paper industry burn	N/A	N=3	Case description	PT oucome (survival, hospitalization)	N/A
pH1-61. Khurana, A. K.; Chaudhary, R.; Ahluwalia, B. K., and Gupta, S. Tear film profile in dry eye. Acta Ophthalmologica. 1991 Feb; 69(1):79-86.	Cohort Control	Tear profile in N=100 pts with dry eye	N=100 pts with dry eye N=100 age/sex matched controls	N=100 pts N=100 controls	Frequency of abnormal tear function	Tear pH monitored via narrow pH paper (6.4 – 8)	pH difference not significant btwn pts and controls

pH1-62. Herr, R. D.; White, G. L. Jr; Bernhisel, K.; Mamalis, N., and Swanson, E. Clinical comparison of ocular irrigation fluids following chemical injury. American Journal of Emergency Medicine. 1991 May; 9(3):228-31.	Case Control	11 adults/12 eyes Univ Utah ED requiring irrigation after chemical exposure	N=11 self-controlled	Compared -saline -lactate ringers -saline ph 7.4 -Na Bicarb - Balanced saline	pH and subjective irritation	pH before and after irrigation by pH ydrion Subjective irritation to 4 irrigation solutions	P<0.05 BSS preferred over normal saline pH normalized after irrigation with all slns
pH1-72. Burns, F. R. and Paterson, C. A. Prompt irrigation of chemical eye injuries may avert severe damage. Occupational Health & Safety. 1989 Apr; 58(4):33-6.	Review (opinion)	Treatment of various chemical exposures	N/A	N/A	N/A	N/A	N/A
pH1-81. Lorette, J. J. Jr and Wilkinson, J. A. Alkaline chemical burn to the face requiring full-thickness skin grafting. [comment]. Annals of Emergency Medicine. 1988 Jul; 17(7):739-41.	Case Report	Alkali chemical burn	N/A	N=1	N/A	Treatment description	N/A
pH1-94. Flynn, W. J.; Mauger, T. F., and Hill, R. M. Corneal burns: a quantitative comparison of acid and base. Acta Ophthalmologica. 1984 Aug; 62(4):542-8.	Case Control	N=6 rabbit corneas	N=6 expt (acid or base) N= 6 control (saline)	N=6 expt vs N=6 controls compared 0 – 0.2 N NaOH 0-1.0 n HCl	Cornea permeability to chemicals	Oxygen flux after chemical exposure	NaOH – 10 secs adequate to produce a complete flux of ions across tissue HCl required 60 secs Alkali penetrates faster than acid in cornea due to caponifying activity on tissue fats.
pH1-103. Johnston, J. R.; McCaughey, W.; Moore, J., and Dundee, J. W. A field trial of cimetidine as the sole oral antacid in obstetric anaesthesia. Anaesthesia. 1982 Jan; 37(1):33-8	Uncontrolled trial	1323 pts requiring general anesthesia	1323 pts given cimetidine 128 C sections 48 planned 84 emergency of latter 54 reported	N=54	Cimetidine reversal of gastric acidity > ph 2.5	pH meter measure of gastric aspirates (<1 mL by paper)	90 mins required for cimetidine to be absorbed and affect acid secretion 50% of pts anesthetized w/ 90 mins of dose had pH <2.5 and needed additional alkalization.

pH1-110. Krenzlok, E. P. and Clinton, J. E. Caustic esophageal and gastric erosion without evidence of oral burns following detergent ingestion. JACEP. 1979 May; 8(5):194-6.	Case report	N=14 pts Hennepin County Med Center	N = 14	N=14 No controls	Assessment of caustic risk	Measure pH of ingested liquid	Nitrazine paper in standard ED's too narrow. Assessment of agent pH requires a wide range pH paper 1 – 12 and extended range 12-14 to help decide whether to endoscope
pH1-113. Wynne, J. W. and Modell, J. H. Respiratory aspiration of stomach contents. [Review] [88 refs]. Annals of Internal Medicine. 1977 Oct; 87(4):466-74.	Review	Stomach aspiration	N/A	N/A	N/A	N/A	
pH1-122. Gruber, R. P.; Laub, D. R., and Vistnes, L. M. The effect of hydrotherapy on the clinical course and pH of experimental cutaneous chemical burns. Plastic & Reconstructive Surgery. 1975 Feb; 55(2):200-4.	Case Control	Mice exposed to 50% NaOH or 36% HCL then varying irrigation times with H2O	Expt 1 – 6 gps of 7 mice brief wash followed by 8 hr shower at 1, 2 and 3 mins post exposure Expt 2 – 70 mice biopsies at varying exposures	N = 7 expt N = 7 control	Mouse outcome & pH	Subcutaneous pH by pressing biopsy against pH paper	Continuous irrigation of H2O for 8 hr less sever damage than brief washing. Hydrotherapy neede w/ 15 mins for HCL & 1 hrNaOH. NaOH caused greater pH change in tissue than HCL that lasted longer.
pH1-128. Fine, K. D. and Schiller, L. R. AGA technical review on the evaluation and management of chronic diarrhea. Gastroenterology 1999 Jun;116(6):1464-86.	Review	N/A	N/A	N/A	N/A	N/A	pH in diarrhea low fecal pH characterized by carbohydrate malabsorption <5.3 indicates lactulose or sorbitol ingestion. >5.6 argues against carbohydrate malabsorption as only cause of diarrhea. Malabsorption with fecal loss of amino acids and fatty acids in addition to carbohydrate is usually higher (pH 6 – 7.5)
Bertram E, Bromberg BE, Song IC, Walden RH. Hydrotherapy of chemical burns. Plast Reconstr Surg 1965;35:85-95.	Retrospective case review & Uncontrolled Stidu	273 pts w/ chemical burns 54 mice subjected to shemical burns and various irrigations	Gp1- continuous irrigation Gp2-continuous 30 mins post Gp3- continuous after 1 hr post Gp 4-continuous after 2 hr post Gp 5- Untreated	N=27 expt mice NaOH N=27 expt mice HCL No controls 85 pts	Extent of injury and recovery	Average time to graft Length hospitalization	HCL less extensive injury than NaOH # not statistically sig Continuous irrigation decreased time to graft and hospitalization compared to brief irrigation and soaking.

**NACB LMPG 2004 Data Abstraction Form
Systematic Review (Data Abstraction Form 2)**

Clinical Question: Does the use of pH paper to diagnose and monitor treatment of chemical exposure in the ED and Urgent Care patient populations improve length of stay and severity of burn compared to empirical treatment (no monitoring)?

Citation	Design	Comparable Initial Groups?	Comparable Groups Maintained?	Comparable Performance Test on Subjects vs Controls?	Comparable Measurement of Outcomes?	Appropriate Analysis?	Comments
<i>CA 5 Smith JA et al</i>	<i>RCT</i>	<i>Both outpts, but ED may be more acute</i>	<i>Same groups maintained</i>	<i>RN and LPN tested in both groups</i>	<i>Time from admit to discharge measured both</i>	<i>Different N in study vs control</i>	<i>Use of control pts outside ED not comparable</i>
pH1-2. Schrage, N. F.; Kompa, S.; Haller, W., and Langefeld, S. Use of an amphoteric lavage solution for emergency treatment of eye burns. First animal type experimental clinical considerations. Burns. 2002 Dec; 28(8):782-6.	Double Masked Study	Yes	Yes	Yes	Yes	Yes	pH not focus of study. Diphoterine more effective than saline at neutralizing alkali burn with no difference in harmful effects after 16 days.
12. Amshel, C. E.; Fealk, M. H.; Phillips, B. J., and Caruso, D. M. Anhydrous ammonia burns case report and review of the literature. [Review] [13 refs]. Burns. 2000 Aug; 26(5):493-7.	Case Report	N/A	N/A	N/A	N/A	N/A	Recommend irrigation of eyes w/ 5-10 secs of exposure for 20 mins or until conjunctival sac is pH <8.5 by pH paper
28. Beiran, I.; Miller, B., and Bentur, Y. The efficacy of calcium gluconate in ocular hydrofluoric acid burns. Human & Experimental Toxicology. 1997 Apr; 16(4):223-8.	Case Control	Yes	Yes	Yes	Yes	Yes	pH normalized after irrigation. Calcium gluconate no advantage for HF injury and given subconjunctivally is toxic and may worsen outcome

35. Bautista, A.; Varela, R.; Villanueva, A.; Estevez, E.; Tojo, R., and Cadranel, S. Motor function of the esophagus after caustic burn. <i>European Journal of Pediatric Surgery</i> . 1996 Aug; 6(4):204-7.	Case Control	Different groups (comparable?)	Yes	Yes	Yes	Yes	pH by pH meter probe can distinguish esophageal disfunction btwn caustic burn vs controls
37. Yano, K.; Hosokawa, K.; Kakibuchi, M.; Hikasa, H., and Hata, Y. Effects of washing acid injuries to the skin with water: an experimental study using rats. <i>Burns</i> . 1995 Nov; 21(7):500-2.	Case Control	Yes	Yes	Yes	Yes	Yes	Irrigation started as soon after exposure leads to less pH tissue change and tissue damage
44. Yano, K.; Hata, Y.; Matsuka, K.; Ito, O., and Matsuda, H. Effects of washing with a neutralizing agent on alkaline skin injuries in an experimental model. <i>Burns</i> . 1994 Feb; 20(1):36-9.	Case Control	Yes	Yes	Yes	Yes	Yes	Recommend H2O immediately after alkali exposure followed by burred sln 10 mins after start of irrigation
45. --- Experimental study on alkaline skin injuries—periodic changes in subcutaneous tissue pH and the effects exerted by washing. <i>Burns</i> . 1993 Aug; 19(4):320-3.	Case Control	Yes	Yes	Yes	Yes	Yes	Alkali eliminated via peripheral tissue and blood flow pH at skin surface is important, washing should be continued until pH of skin surface returns to normal.
57. Janda, A. M. Ocular trauma. Triage and treatment. <i>Postgraduate Medicine</i> . 1955 Nov 15-1960 Nov 15; 90(7):51-2	Case Report	N/A	N/A	N/A	N/A	N/A	Risk of thermal-chemical burn. No recommendations. Manage patients with immediate irrigation and life support follow-up
61. Khurana, A. K.; Chaudhary, R.; Ahluwalia, B. K., and Gupta, S. Tear film profile in dry eye. <i>Acta Ophthalmologica</i> . 1991 Feb; 69(1):79-86.	Case Control	Yes	Yes	Yes	Yes	Yes	pH not considered to have a role in diagnosis of dry eye.

62. Herr, R. D.; White, G. L. Jr; Bernhisel, K.; Mamalis, N., and Swanson, E. Clinical comparison of ocular irrigation fluids following chemical injury. American Journal of Emergency Medicine. 1991 May; 9(3):228-31.	Case Report	Yes	Yes	Yes	Yes	Yes	pH not discussed
72. Burns, F. R. and Paterson, C. A. Prompt irrigation of chemical eye injuries may avert severe damage. Occupational Health & Safety. 1989 Apr; 58(4):33-6.	Review (opinion)	N/A	N/A	N/A	N/A	N/A	Recommends determining pH of eye during irrigation by using litmus paper. Generally accepted pH of external eye should return to normal before discontinuing irrigation. Authors differ on recommended duration of irrigation. 30 mins has served as the standard, others recommend 1 liter of sln. If pH doesn't normalize after prolonged irrigation, consider particulate matter in eye.
81. Lorette, J. J. Jr and Wilkinson, J. A. Alkaline chemical burn to the face requiring full-thickness skin grafting.[comment]. Annals of Emergency Medicine. 1988 Jul; 17(7):739-41.	Case Report	N/A	N/A	N/A	N/A	N/A	Treatment delays of more than 1 hr for alkaline burns have been shown to damage skin to such a degree that subsequent hydrotherapy will have little or no effect on subcutaneous pH and outcome. Although first hr of immediate and continuous irrigation most important. Further irrigation does little to alter pH
94. Flynn, W. J.; Mauger, T. F., and Hill, R. M. Corneal burns: a quantitative comparison of acid and base. Acta Ophthalmologica. 1984 Aug; 62(4):542-8.	Case Control	Yes	Yes	Yes	Yes	No monitored O2 flux as indicative of tissue changes	

<p>103. Johnston, J. R.; McCaughey, W.; Moore, J., and Dundee, J. W. A field trial of cimetidine as the sole oral antacid in obstetric anaesthesia. <i>Anaesthesia</i>. 1982 Jan; 37(1):33-8</p>	<p>Uncontrolled Trial</p>	<p>Non-sequential</p>	<p>Yes</p>	<p>Yes</p>	<p>Yes</p>	<p>Yes</p>	<p>pH as indicator of risk pulmonary aspiration during anesthesia</p>
<p>110. Krenzelok, E. P. and Clinton, J. E. Caustic esophageal and gastric erosion without evidence of oral burns following detergent ingestion. <i>JACEP</i>. 1979 May; 8(5):194-6.</p>	<p>Case Report</p>	<p>No controls</p>	<p>N/A</p>	<p>N/A</p>	<p>N/A</p>	<p>N/A</p>	
<p>113. Wynne, J. W. and Modell, J. H. Respiratory aspiration of stomach contents. [Review] [88 refs]. <i>Annals of Internal Medicine</i>. 1977 Oct; 87(4):466-74.</p>	<p>Review</p>	<p>N/A</p>	<p>N/A</p>	<p>N/A</p>	<p>N/A</p>	<p>N/A</p>	<p>Aspiration of acidic gastric fluid causes pulmonary injury. Cutoff varies by species, pH <1.7 for rats, 2.1-2.4 for rabbits and < 2.5 suggested for humans but not proven/</p>
<p>122. Gruber, R. P.; Laub, D. R., and Vistnes, L. M. The effect of hydrotherapy on the clinical course and pH of experimental cutaneous chemical burns. <i>Plastic & Reconstructive Surgery</i>. 1975 Feb; 55(2):200-4.</p>	<p>Case Control</p>	<p>Yes</p>	<p>Yes</p>	<p>Yes</p>	<p>Yes</p>	<p>Yes</p>	

pH1-128. Fine, K. D. and Schiller, L. R. AGA technical review on the evaluation and management of chronic diarrhea. Gastroenterology 1999 Jun;116(6):1464-86.	Review	N/A	N/A	N/A	N/A	N/A	
Bertram E, Bromberg BE, Song IC, Walden RH. Hydrotherapy of chemical burns. Plast Reconstr Surg 1965;35:85-95.	Retrospective case review & Uncontrolled Cohort	Not statistically significant	Yes	Yes	Yes		

**NACB LMPG 2004 Data Abstraction Form
Systematic Review Summary**

Clinical Question: Does the use of pH paper to diagnose and monitor treatment of chemical exposure in the ED and Urgent Care patient populations improve length of stay and severity of burn compared to empirical treatment (no monitoring)?

Volume of Literature					FINAL		
Aggregate Internal Validity	Aggregate External Validity	Coherence Consistency	Overall Link POCT to Outcome	Net Patient Benefit?	Recommendation	Reviewers	Comments
Poor	Poor	Poor	Indeterminate Not well studied	Indeterminate	C Neither for or against	JN, DT, HV, LW	

**NACB LMPG 2004 Data Abstraction Form
Reviewer List**

Clinical Question: Does the use of pH paper to diagnose and monitor treatment of chemical exposure in the ED and Urgent Care patient populations improve length of stay and severity of burn compared to empirical treatment (no monitoring)?

Reviewer's Initials	Name
JN	James H. Nichols, Ph.D., DABCC, FACB
LW	Leslie Williams, MT (ASCP)
DT	Dawn Taylor, MT (ASCP)
HV	Heike Varnholt, M.D.

(Inkeniene; Klimas; Briedis, and Maciulevicius 2003;Schrage; Kompa; Haller, and Langefeld 2002;Gupta; Gupta; Joshi, and Tandon 2002;Ozcan; Ozcan; Erinc; Dirlik, and Mutaf 2001;Gundarova; Chesnokova; Shekhter; Davydova; Pekshev; Kvasha; Beznos, and Gorbacheva 2001;Herber; Grus; Sabuncuo, and Augustin 2001;Ghose; Garodia; Sachdev; Kumar; Biswas, and Pandey 2001;Blesa; Moreno; Alaminos; Gamez; Jimenez; Nunez; Cabrera, and Santamaria 2001;Karkkainen 2001;Gionfriddo; Melgarejo; Morrison; Alinovi; Asem, and Krohne 2000;Gerard; Josset; Louis; Menerath; Blomet, and Merle 2000;Amshel; Fealk; Phillips, and Caruso 2000;Sheu; Chi; Yang; Jen, and Lin 1999;Barnes and Nash 1999;Ramos Carrasco; Hyat Inurrieta; Perez Contin; Calderon Duque; Aparicio Medrano; Duran Gimenez-Rico; Martinez Sarmiento, and Alvarez Fernandez-Represa 1999;Abakumov; Kostiuhenko, and Kudriashova 1999;Woolf and Shaw 1999;Gerard; Louis; Merle; Josset; Menerath, and Blomet 1999;Gerard; Merle; Ayeboua, and Richer 1999;Reitz; Breipohl; Augustin, and Bours 1998;Yamada; Kawai; Mochizuki; Hata, and Mashima 1998;Gasymov; Abduragimov; Yusifov, and Glasgow 1998;McNamara; Polse, and Bonanno 1998;Yamataka; Pringle, and Wyeth 1998;Gonul; Erdogan; Bilgihan, and Ozogul 1997-1998;Molloy; Bolis; Herbert; Ou; Tyler; van Dyk; Willcox; Gooley; Williams; Morris, and Walsh 1997;Varnell; Maitchouk; Beuerman; Salvatore; Carlton, and Haag 1997;Beiran; Miller, and Bentur 1997;Yamada; Mochizuki; Kawai; Yoshino, and Mashima 1997;McConville; Pope, and Huff 1997;Mrvos and Krenzelok 1997;Maudgal ;Simon; Coiffard; Rivalland, and De Roeck-Holtzhauer 1996;Sack; Sathé; Hackworth; Willcox; Holden, and Morris 1996;Bautista; Varela; Villanueva; Estevez; Tojo, and Cadranel 1996;Dickinson and Thiesse 1996;Yano; Hosokawa; Kakibuchi; Hikasa, and Hata 1995;Katsu and Yabe 1995;Tripathi; Somwanshi; Singh, and Bajaj 1995;Baguet; Claudon-Eyl; Sommer, and Chevallier 1995;Coiffard; Rivalland, and De Roeck-Holtzhauer 1995;Kahanne; Bogi; Farkas; Tudos, and Imre 1994;Su; Hsu; Chang, and Hsu 1994;Yano; Hata; Matsuka; Ito, and Matsuda 1994;Yano; Hata; Matsuka; Ito, and Matsuda 1993;Paredes Osado; Gras Albert; Crespo Marco, and Mira Navarro 1993;Rout; Rocke, and Gouws 1993;Norn 1992;Papadimitriou; Kandiloros; Lakiotis, and Vlontzos 1992;Baguet; Claudon-Eyl, and

Gachon 1992;Walgenbach and Junginger 1992;Cejkova; Lojda; Vacik; Digenis, and Dropcova 1992;Gorman; Khin-Maung-Gyi; Klein-Schwartz; Oderda; Benson; Litovitz; McCormick; McElwee; Spiller, and Krenzelok 1992;Winemaker; Douglas, and Peters 1992;Lim and Elegbe 1991;Yildirim; Topbas; Usluer; Ozgunes; Basmak, and Yurdakul 1991;Janda 1955-1960;Adamek; Weber; Benz, and Riemann 1991;Howell 1991;Hugh; Meagher, and Li 303;Khurana; Chaudhary; Ahluwalia, and Gupta 1991;Herr; White; Bernhisel; Mamalis, and Swanson 1991;McCulley ;Rieger 1990;Ormezzano; Ganansia; Arnould; Gregoire; Wessel; Bourgeonneau; Bukowski; Grinand; Viaud, and N'Guyen 1990;Ormezzano; Francois; Viaud; Bukowski; Bourgeonneau; Cottron; Ganansia; Gregoire; Grinand, and Wessel 1990;Chen and Maurice 1990;Gallagher; Schwartz, and Weinstein 1990;Sheppard; Orenstein; Chao; Butala, and Kowalski 1989;Hoffman; Howland; Kamerow, and Goldfrank 1989;Usui; Matsukawa; Hamada; Watanabe; Kondo; Kitamura; Kuwabara, and Shirakabe 1989;Burns and Paterson 1989;Manevich; Kharitonov, and Sonts 1989;Kuster; Naji; Gabi, and Kreienbuhl 1989;Fassihi and Naidoo 1989;Bikfalvi; Dupuy; Inyang; Fayein; Leseche; Courtois, and Tobelem 1989;Norn 1988;Colman; Frank; Loughnan; Cohen, and Cattermole 1988;Kovanev; Sinev; Novosel'tseva; Mironov, and Il'iashenko 1988;Pike; Patterson, and Arons 1988;Lorette and Wilkinson 1988;Bonanno and Polse 1987;Thygesen and Jensen 1987;Coyle; Sibony, and Johnson 1987;Lewandowska-Furmanikowa 1986;Mathews; Wilson; Thompson, and Moore 1986;Chien and Schoenwald 1986;Yasui 1986;Lacouture; Gaudreault, and Lovejoy 1986;Norn ;Urtti and Salminen 1985;Sigrist and Flury 1985;Gachon; Bilbaut, and Dastugue 1985;Flynn; Mauger, and Hill 1984;Basu; Avaria; Cutz, and Chipman 1984;McAuley; Moore; Dundee, and McCaughey 1984;Conrads; Winterhoff, and Strotmann 1984;Peters 1984;Chen; Toung; Haupt; Hutchins, and Cameron 1984;Picardi; Cesari; Chiavola; Alessi; Manfroni; Di Giorgio, and Cantarini 1982;Basu; Avaria, and Hasany 1982;Wrobel; Koh, and Saunders 1982;Johnston; McCaughey; Moore, and Dundee 1982;Coombs; Hooper, and Pageau 1982;Machida 1981;Eichler; Lenz, and Hruby 1981;Doroshov; Locker; Gaasterland; Hubbard; Young, and Myers 1981;Okawada; Mizoguchi, and Ishiguro 1979;Carney and Hill 1979;Krenzelok and Clinton 1979;Paterson; Eakins; Paterson; Jenkins, and Ishikawa 1979;Ancona Alayon and Aranda Martinez 1978;Wynne and Modell 1977;Hill and Carney 1976;Longwell; Birss; Keller, and Moore 1976;Carney and Hill 1976;Carney and Hill 1976;Cejkova; Lojda; Obenberger, and Havrankova 1975;Laux; Roth; Krey, and Steinhardt 1975;Paterson; Pfister, and Levinson 1975;Smith and Shear 1975;Gruber; Laub, and Vistnes 1975;Graupner 1973;Graupner 1970;Graupner and Hausmann 1970;Graupner 1968;Graupner and Hausmann 1968)

Reference List

1. Inkeniene, A. M.; Klimas, R.; Briedis, V., and Maciulevicius, J. (Department of Pharmaceutical Technology and Pharmacy Organization, Kaunas University of Medicine, A. Mickeviciaus 9, 3000 Kaunas, Lithuania). [Development of formulation of hipromellose eye drops (artificial tears)]. [Lithuanian]. *Medicina (Kaunas)*. 2003; 39(1):77-82.
Abstract: The task of this research work was to develop a formulation of hipromellose ophthalmic preparation by determining optimal composition of active ingredients and excipients. Aqueous solution of hipromellose 1% and sorbitol 4.5% was prepared with addition of

phosphate buffer (pH 7.05) and preservative cetrimide 0.01%. Sterile filtration was used for solution sterilization. Polymeric membrane prefilters of 1 microm, 0.45 microm and 0.22 microm pore size were employed as sterilizing filter. It is recommended to increase the temperature up to 35-38 degrees C for more efficient filtration of the solution. Quality parameters and analytical methods for quality control have been developed to control the quality and to evaluate the stability of hipromellose eye drops during their storage for 24 months. The obtained results confirmed the sterility and stability of hipromellose eye drops for the period of two years

2. Schrage, N. F.; Kompa, S.; Haller, W., and Langefeld, S. (Department of Ophthalmology, Eye-Clinic RWTH Aachen, Pauwelstrasse 30, D-52057 Aachen, Germany. schrage@acto.de). Use of an amphoteric lavage solution for emergency treatment of eye burns. First animal type experimental clinical considerations. *Burns*. 2002 Dec; 28(8):782-6.
Abstract: PURPOSE: Severe eye burns occur rarely, but are related to a poor prognosis in rehabilitation. As emergency treatment has been identified as decisive factor for the prognosis of eye burns, new first aid rinsing solutions should be considered carefully in their clinical action. In a first approach, the new drug Diphoterine was subjected to a comparison with saline solution to evaluate the effects in a model of severe eye burns. METHODS: In a double-masked experiment 16 rabbits underwent a severe eye burn of one cornea followed by immediate rinsing with 0.9% sodium-chlorine solution (n=8) or Diphoterine (n=8). During 16 days after burn, an irrigation therapy with 0.9% saline solution three times daily 160 ml was applied in both groups following the recommendation of prolonged irrigation therapy performed in our clinic. In a similar setup, 16 eyes were subjected alkali burns with measurements of aqueous humor pH within 30s after burn and after a period of 5 min rinsing with 500 ml saline 0.9% or Diphoterine, respectively. RESULTS: The result of the severe eye burn with an opaque cornea was similar in both groups. During rinsing no fibrin precipitates occurred in the Diphoterine rinsed group whereas this was detectable in all eyes rinsed with saline solution. After 16 days there was no difference between both groups indicating no harmful effect of Diphoterine as emergency treatment compared to saline 0.9%. After 30s of burn with 1N NaOH and rinsing with 500 ml of the specified solutions the anterior chamber pH was 10+/-0 in the saline group and 9.35+/-0.3 in the Diphoterine group showing efficacy of the buffering capacity of Diphoterine. CONCLUSION: Diphoterine proves to be efficient in the primary treatment of burns. The anterior chamber pH could be lowered by 5min of rinsing. No harmful effects of Diphoterine could be observed compared to rinsing with saline solution in the course of an severe alkali burn of the cornea
3. Gupta, S. K.; Gupta, V.; Joshi, S., and Tandon, R. (Department of Pharmacology, All India Institute of Medical Sciences, New Delhi, India). Subclinically dry eyes in urban Delhi: an impact of air pollution? *Ophthalmologica*. 2002 Sep-2002 Oct 31; 216(5):368-71.
Abstract: PURPOSE: To study the effects of air pollution on the eyes of persons staying in the metropolis of New Delhi. MATERIALS AND METHODS: 400 healthy volunteers from within and outside the metropolis of Delhi were investigated for the presence of tear film abnormalities. All persons underwent slitlamp examination to rule out any ocular surface disorder. The tear break-up time (BUT) was assessed along with a Schirmer test and the tear lysozyme activity and the tear pH were determined. RESULTS: Of the 210 persons staying in the metropolis, 50 (24%) had an abnormal BUT, 14 (6.6%) had an abnormal Schirmer test, and the tear lysozyme activity was found to be low in 12 (5%). In contrast, of those 190 persons living outside the metropolis, only 10 (5.2%) had an abnormal BUT, 4 (2%) had an abnormal Schirmer test, and none had a low lysozyme activity (p < 0.05). None of the persons in either group had significant eye symptoms. CONCLUSIONS: Tear film abnormalities are present in a large number of people staying within the metropolis of New Delhi who have apparently normal eyes. Air pollution over a long period of time could possibly be associated with their causation. Copyright 2002 S. Karger AG, Basel
4. Ozcan, Z.; Ozcan, C.; Erinc, R.; Dirlik, A., and Mutaf, O. (Department of Nuclear Medicine, Ege University Medical Faculty, 35100-Bornova, Izmir,

Turkey. zehraozcan@ixir.com). Scintigraphy in the detection of gastro-oesophageal reflux in children with caustic oesophageal burns: a comparative study with radiography and 24-h pH monitoring. *Pediatric Radiology*. 2001 Oct; 31(10):737-41.

Abstract: BACKGROUND: Caustic injury of the oesophagus not only causes luminal narrowing but is also responsible for longitudinal contraction, resulting in gastro-oesophageal reflux (GOR), which leads to failure of conventional therapy. Therefore, the development of GOR should be investigated periodically to direct appropriate management of these patients. PURPOSE: To determine the ability of scintigraphy to detect GOR in children with caustic oesophageal strictures in comparison with barium study and 24-h pH monitoring. MATERIALS AND METHODS: Seventeen children with caustic oesophageal injury underwent scintigraphy, an upper GI barium study and 24-h pH monitoring within the same week. Five patients were also investigated post-operatively for the assessment of surgical outcome after antireflux surgery. RESULTS: On the whole, there was good correlation ($r = 0.78$, $P < 0.001$) between scintigraphy and 24-h oesophageal pH monitoring. Scintigraphy detected all but one (9/10) refluxing patients and also correctly identified all (7/7) non-refluxing patients. Barium studies demonstrated 6 out of 10 refluxing patients. There were no false-positive barium studies in non-refluxing patients. Post-operative studies demonstrated no evidence of GOR in surgically treated patients. CONCLUSIONS: Our results indicate that, by comparison with barium studies, scintigraphy is useful in the detection of GOR in cases with caustic oesophageal strictures and may be used as a screening modality for those under clinical follow-up

5. Gundarova, R. A.; Chesnokova, N. B.; Shekhter, A. B.; Davydova, N. G.; Pekshev, A. V.; Kvasha, O. I.; Beznos, O. V., and Gorbacheva, O. A. [Effects of gaseous flow containing nitric oxide on the eyeball structures (an experimental study)]. [Russian]. *Vestnik Oftalmologii*. 2001 Jul-2001 Aug 31; 117(4):29-32.

Abstract: Nitric oxide is one of the main factors of intra- and intercellular regulation in the organism. Its vasodilating, antiaggregant, antithrombogenic, antibacterial, anticarcinogenic, and immunogenic effects are well known. It stimulates the reparative processes in soft tissue injuries. We failed to find reports about the role of NO in the wound process in the eyes. The source of NO in our experiments was medical air-plasma device Plason. Exposure of the eye to NO-containing gaseous flow did not cause changes in the lacrimal pH; NO penetrated through the cornea and sclera, exerted no appreciable cytotoxic effect on the surface epithelium of the eye, did not change the intraocular pressure, and caused no morphological changes in ocular tissues. On the other hand, NO-containing gaseous flow had an appreciable lasting effect on the diameter of the conjunctival vessels, this effect being dose-dependent. The doses of NO-containing gaseous flow which can be used in the treatment of eye wounds were determined

6. Herber, S.; Grus, F. H.; Sabuncuo, P., and Augustin, A. J. (Department of Ophthalmology, University of Mainz, Germany). Two-dimensional analysis of tear protein patterns of diabetic patients. *Electrophoresis*. 2001 May; 22(9):1838-44.

Abstract: In diabetic patients, dry eye and other ocular surface diseases occur more often than in healthy subjects. The aim of this study was to analyze the tear protein patterns of patients suffering from diabetes mellitus type II (dia) and to compare them to the patterns of healthy volunteers (ctrl). Tear proteins of nonstimulated tears of 20 patients (ctrl n=10, dia n=10) were separated using two-dimensional electrophoretic techniques. The protein patterns of each group were analyzed by a multivariate analysis of discriminance. Furthermore, for all spots of each gel, a 50 x 50 variables pH/Mr (molecular weight) array was generated and subsequently analyzed by a multivariate analysis of discriminance. Additionally, an artificial neural network was trained using the matrix data as input and a sensitivity analysis was performed to figure out, which spots were the most important to differentiate between the tear protein patterns. In both groups a complex staining pattern could be obtained. In diabetic patients significantly more spots were detected compared to the control group ($P < 0.02$). The analysis of discriminance found a highly

significant difference between dia and ctrl ($P < 0.00001$). Using the matrix data, the analysis of discriminance showed a significant difference between the two groups, too ($P < 0.0001$). The sensitivity analysis by means of the artificial neural network revealed several spots that were more expressed or more frequently present in the diabetic group. Our findings reveal that the composition of tear proteins of diabetic patients is different from that of healthy subjects. The use of the two-dimensional electrophoretic technique could give more insight into the diabetic-related changes in the tear film composition

7. Ghose, S.; Garodia, V. K.; Sachdev, M. S.; Kumar, H.; Biswas, N. R., and Pandey, R. M. (Dr. Rajendra Prasad Centre for Ophthalmic Sciences, All India Institute of Medical Sciences (AIIMS), Ansari Nagar, New Delhi, India). Evaluation of potentiating effect of a drop of lignocaine on tropicamide-induced mydriasis. *Investigative Ophthalmology & Visual Science*. 2001 Jun; 42(7):1581-5.
Abstract: PURPOSE: To analyze whether preinstillation of lignocaine potentiates mydriasis by tropicamide in dark eyes and to determine possible mechanisms for this effect. METHODS: This investigation was conducted in two phases, the first being a double-masked, placebo-controlled, randomized clinical trial, enrolling 60 healthy dark brown eyes in 30 subjects aged 7 to 58 years. The control eye received a drop of (nolignocaine) placebo before tropicamide 1%, and the contralateral study eye received a 4% lignocaine drop 3-minutes before the 1 drop of tropicamide was administered. A ruled pupillometer recorded pupil diameters every 10 minutes for 50 minutes. In phase II, to elucidate pathomechanisms after lignocaine, corneal and tear parameters were compared with baseline records in a further 60 such eyes. RESULTS: Pupillary diameters in the study eyes increased by 3.62 +/- 0.75 mm, significantly more than in the placebo (control) group ($P = 0.000$). Ninety percent of study eyes attained the clinically significant 6-mm size with preinstillation of lignocaine-many more than the 67% of control eyes ($P = 0.016$). The median time to achieve this critical 6-mm size was significantly faster in the study group ($P = 0.005$). In phase II, the 1 drop 4% lignocaine did not show corneal changes with slit lamp or fluorescein staining and did not reduce media clarity or induce a significant change in tear pH. It markedly decreased Schirmer values ($P = 0.000$), reduced tear break-up time ($P = 0.003$), and increased corneal thickness measured by optical pachymetry ($P = 0.010$). CONCLUSIONS: The phase II findings indicate corneal microepithelial damage and reduced tearing. Both may enhance intraocular penetration and hence potentiation of tropicamide. This remarkable phenomenon could find use with many other important topical medications

8. Blesa, E.; Moreno, C.; Alaminos, M.; Gamez, S.; Jimenez, C. J.; Nunez, R.; Cabrera, R., and Santamaria, J. I. (Hospital Materno-Infantil de Badajoz y de Granada). [Severe caustic injuries of the esophagus: when to replace the esophagus]. [Spanish]. *Cirugia Pediatrica*. 2001 Jan; 14(1):34-7.
Abstract: From June 1985 to May 1998, 20 patients have been treated in our hospital by esophageal dilatations due to serious esophageal caustic stenosis. A retrospective analysis of these 20 patients was performed, evaluating age, sex, causative agent, number and time of dilatations, iatrogenic esophageal perforations, gastroesophageal reflux (GER) and psychological and social consequences. Follow-up has ranged from 1.5 to 14.5 years (mean = 8.07 years). The mean age at the time of accidental swallow was 42.2 months. The causative agent was dishwashing detergent in 11 patients and caustic soda in 9 patients. The mean of dilatations needed was 19.1 and the average duration of dilatations was 24.7 months. Seven patients had esophageal perforation during dilatation and none of them required surgical treatment. All patients had improvement of swallowing and an easier esophageal dilatation afterwards. Oral contrast studies demonstrated distortion of the esophago-gastric junction in the majority of patients. Ten patients were screened for GER with 24-hour esophageal pH monitoring in the first year postburn and it was pathological in 5. Antireflux surgery was carried out in 4 patients with a conspicuous improvement following surgery. Dilatations proved successful in 16 patients in less than two years, and in more than two years in 3 patients. The authors conclude that the majority of children with esophageal caustic stenosis can be managed successfully by esophageal dilatations, even with dilatation periods longer than two years or when an

esophageal perforation occur during the procedure. The paramount importance of early diagnosis and treatment of GER is stressed

9. Karkkainen, T. R. (Southern College of Optometry, Memphis, Tennessee 38104, USA. Kark@sco.edu). The effect of refrigeration on the osmolality and pH of nonpreserved artificial tears containing carboxymethylcellulose. *Optometry & Vision Science*. 2001 Jan; 78(1):37-9.
Abstract: INTRODUCTION: Nonpreserved artificial tears (NPAT) are a recommended treatment for dry eye. The manufacturers' instructions state to discard the container after initial opening and use. Some clinicians advocate the use and storage of NPAT in a zip-lock bag in a refrigerator for up to 12 h. The purpose of this study was to evaluate whether refrigeration of opened NPAT over a 12-h period had any effect on the pH or osmolality. METHODS: Forty individual carboxymethylcellulose NPAT samples were used in this study. The initial osmolality and pH of each sample were measured with a vapor pressure osmometer and electronic pH meter. The samples were refrigerated (4 degrees C) in closed zip-lock plastic bags for 12 h. After storage, the pH and osmolality of the samples were measured. The data were statistically analyzed for significant differences using a paired t-test. RESULTS: The mean initial pH and osmolality before refrigeration were 6.46 pH units and 304.10 mmol/kg, respectively. After refrigeration, the mean pH was 6.44 units, and mean osmolality was 305.87 mmol/kg. Paired t-tests revealed a nonsignificant difference ($p > 0.05$) for both pH and osmolality. CONCLUSION: Refrigeration of opened carboxymethylcellulose NPAT stored in closed zip-lock plastic bags does not have a significant effect on the osmolality or pH of the solution. Storage of NPAT containing carboxymethylcellulose is an acceptable practice with regards to stability of pH and osmolality
10. Gionfriddo, J. R.; Melgarejo, T.; Morrison, E. A.; Alinovi, C. A.; Asem, E. K., and Krohne, S. G. (Department of Veterinary Clinical Sciences, School of Veterinary Medicine, Purdue University, West Lafayette, IN 47906, USA). Comparison of tear proteins of llamas and cattle. *American Journal of Veterinary Research*. 2000 Oct; 61(10):1289-93.
Abstract: OBJECTIVE: To analyze and compare contents of the preocular tear films of llamas and cattle. ANIMALS: 40 llamas and 35 cattle. PROCEDURE: Tear pH was determined by use of a pH meter. Total protein concentration was determined by use of 2 microtiter methods. Tear proteins were separated by use of electrophoresis and molecular weights of bands were calculated. Western blot immunoassay was used to detect IgA, lactoferrin, transferrin, ceruloplasmin, alpha1-antitrypsin, alpha1-amylase, and alpha2-macroglobulin. Enzyme electrophoresis was used to detect proteases. RESULTS: The pH of llama and cattle tears were 8.05 +/- 0.01 and 8.10 +/- 0.01, respectively. For results of both methods, total protein concentration of llama tears was significantly greater than that of cattle tears. Molecular weights of tear protein bands were similar within and between the 2 species, although llama tears had a distinct 13.6-kd band that was not detected in cattle. Lactoferrin, IgA, transferrin, ceruloplasmin, alpha1-antitrypsin, alpha1-amylase, alpha2-macroglobulin, and proteases were detected in both species. CONCLUSIONS AND CLINICAL RELEVANCE: Llama tears have significantly greater total protein concentration than cattle tears, whereas pH is similar between species. Because little variation was detected within species for the number and molecular weight of protein bands, pooling of tears for analysis is justified. Results suggest that lactoferrin, ceruloplasmin, transferrin, alpha1-antitrypsin, alpha2-macroglobulin, alpha1-amylase, and IgA are present in the tears of llamas and cattle
11. Gerard, M.; Josset, P.; Louis, V.; Menerath, J. M.; Blomet, J., and Merle, H. (Service d'Ophtalmologie, Centre Hospitalier Universitaire de Fort de France, Hopital Pierre Zobda Quitman, BP 632, 97261 Fort de France Cedex). [Is there a delay in bathing the external eye in the treatment of ammonia eye burns? Comparison of two ophthalmic solutions: physiological serum and Diphoterine]. [French]. *Journal Francais d Ophthalmologie*. 2000 May; 23(5):449-58.
Abstract: PURPOSE: An experimental animal study was conducted to analyze the delay for ocular bathing in the treatment of severe ocular

ammonia burns. Two solutions of ocular wash, saline solution and Diphoterine were compared. MATERIAL: and methods: The study included 23 eyes of New Zealand albino rabbits that received for 1 minute 100 microl of 15.3% ammonium solution. Each eye was then washed with 250 of saline solution or 250ml Diphoterine after a delay of 1, 3, 5, 10 or 30 minutes. Effects were assessed on the basis of changes in anterior chamber pH, ammonia concentration in the anterior chamber, and cytopathology examination of the burned corneas. RESULTS: Ocular wash with Diphoterine in the first minutes following ocular burn induced an inflexion of the pH curve unlike ocular wash with saline solution. At 30 minutes, there was no inflexion of the pH curve and the ammonia concentration in the anterior chamber was low. Contrary to ocular wash using Diphoterine, stromal edema was seen at cytopathological analysis after washing with saline solution. CONCLUSIONS: This study provides evidence of the interest of ocular bathing in the first minutes following ocular burn by ammonia. The efficacy of external ocular washing with Diphoterine was proven by biochemical and cytopathological demonstrations. The importance of sequelae were related to the degree of initial stromal edema

12. Amschel, C. E.; Fealk, M. H.; Phillips, B. J., and Caruso, D. M. (Department of Surgery, Maricopa Medical Center, Phoenix, AZ 85008, USA). Anhydrous ammonia burns case report and review of the literature. [Review] [13 refs]. *Burns*. 2000 Aug; 26(5):493-7.
Abstract: Chemical burns are associated with significant morbidity, especially anhydrous ammonia burns. Anhydrous ammonia is a colorless, pungent gas that is stored and transported under pressure in liquid form. A 28 year-old patient suffered 45% total body surface area of second and third degree burns as well as inhalational injury from an anhydrous ammonia explosion. Along with fluid resuscitation, the patient's body was scrubbed every 6 h with sterile water for the first 48 h to decrease the skin pH from 10 to 6-8. He subsequently underwent a total of seven wound debridements; initially with allograft and then autograft. On post burn day 45, he was discharged. The injuries associated with anhydrous ammonia burns are specific to the effects of ammonium hydroxide. Severity of symptoms and tissue damage produced is directly related to the concentration of hydroxyl ions. Liquefactive necrosis results in superficial to full-thickness tissue loss. The affinity of anhydrous ammonia and its byproducts for mucous membranes can result in hemoptysis, pharyngitis, pulmonary edema, and bronchiectasis. Ocular sequelae include iritis, glaucoma, cataracts, and retinal atrophy. The desirability of treating anhydrous ammonia burns immediately cannot be overemphasized. Clothing must be removed quickly, and irrigation with water initiated at the scene and continued for the first 24 h. Resuscitative measures should be started as well as early debridement of nonviable skin. Patients with significant facial or pharyngeal burns should be intubated, and the eyes irrigated until a conjunctivae sac pH below 8.5 is achieved. Although health care professionals need to be prepared to treat chemical burns, educating the public, especially those workers in the agricultural and industrial setting, should be the first line of prevention. [References: 13]
13. Sheu, B. S.; Chi, C. H.; Yang, H. B.; Jen, C. M., and Lin, X. Z. (Department of Internal Medicine, National Cheng Kung University Hospital, Tainan, Taiwan. sheubs@mail.ncku.edu.tw). A three-day course of intravenous omeprazole plus antibiotics for H. pylori-positive bleeding duodenal ulcer. *Hepato-Gastroenterology*. 1999 Jul-1999 Aug 31; 46(28):2363-71.
Abstract: BACKGROUND/AIMS: This prospective trial aimed to test the efficacy of 3-day intravenous omeprazole plus antibiotics for Helicobacter pylori (H. pylori) eradication rate, and to see whether individualized response to omeprazole in intragastric pH elevation will alter the success of eradication. METHODOLOGY: One hundred and thirty-eight cases with H. pylori-positive duodenal ulcer were randomized into four therapy groups: Group 1 (n = 32) received a 3-day course of intravenous omeprazole (80 mg loading then 40 mg q 9 am & 9 pm) plus ampicillin/salbactam (1.5 gm i.v. loading then 750 mg q 9 am, 3 pm, & 9 pm); Group 2 (n = 35) followed protocol as for Group 1 except the antibiotics were metronidazole and erythromycin (both 500 mg i.v. q 9 am, 3 pm, & 9 pm). Group 3 (n = 31) followed protocol as for Group 1 and further added with erythromycin (both 500 mg i.v. q 9 am, 3 pm, & 9 pm). Group 4 served as a control group (n = 40) receiving oral

dual therapy after leaving the emergency room (omeprazole 20 mg and amoxicillin 1 g bid x 2 weeks). In each case, three gastric biopsies were done for total histologic density of *H. pylori* (THPD) (range: 0-15) before, 1 day and 6 weeks after completion of therapy. Except for the control group, the 24-hour ambulatory intragastric pH meter (MIC Inc, Gastrograph Spark III, Swiss) was inserted as possible on the 2nd day of therapy. RESULTS: The 3-day intravenous regimens achieved high clearance rates of *H. pylori* (Group 1: 93.8%; Group 2: 93.9%; Group 3: 100%). The eradication rates of *H. pylori* in Groups 1-4 were 43.8%, 57.1%, 58.1%, and 72.8%, respectively. In Groups 1-3, the *H. pylori*-eradicated cases had lower pre-treatment THPD than non-eradicated cases (6.01 vs. 9.24, $p < 0.001$). Among 72 cases with pH meter insertion, the percentage of intragastric pH > 5.3 during 24-hour was not different among 35 *H. pylori* non-eradicated and 37 eradicated cases (78.7 vs. 76.7%, $p > 0.05$). CONCLUSIONS: The 3-day intravenous regimens may achieve clearance of *H. pylori* quickly. However, they were not so effective for eradication, especially in cases with higher bacterial loads. The interindividual response to omeprazole in intragastric pH elevation under the study dosage had insignificant variations to alter the success of eradication

14. Barnes, A. R. and Nash, S. (Pharmaceutical Sciences Institute, Aston University, Birmingham, UK. abarnes@dmu.ac.uk). Stability of ceftazidime in a viscous eye drop formulation. *Journal of Clinical Pharmacy & Therapeutics*. 1999 Aug; 24(4):299-302.
Abstract: OBJECTIVE: To assess the stability of an extemporaneously prepared ceftazidime eye-drop. METHOD: Ceftazidime was formulated at a concentration of 5% w/v as an eye drop, using Sno Tears, an artificial tear solution containing polyvinyl alcohol, as a vehicle. Two batches of the formulation were stored in 10 ml eye drop bottles at 7 and 25 degrees C for up to 14 days. Ceftazidime and pyridine, its degradation product, were determined at intervals by HPLC. RESULTS: A yellow coloration was evident after 7 days at 7 degrees C and after 24 h at 25 degrees C. Ceftazidime lost approximately 35% after 7 days storage at 25 degrees C. At 7 degrees C, the mean time to 10% degradation, determined by linear regression, was 11 and 8 days for the two batches. However, the lower 95% confidence limits were 8 and 5 days, respectively. Pyridine levels increased during storage. The mass balance between ceftazidime remaining and pyridine formed was close to 100% during the early part of storage. By the end of storage, the balance had reduced to around 95% at 7 degrees C and 80% at 25 degrees C. This discrepancy may be due to sorption of pyridine to the butyl rubber bottle closure. The pH remained in the range 6-7 throughout the storage period. CONCLUSION: The formulation may be stored for 5 days in the refrigerator
15. Ramos Carrasco, A.; Hyat Inurrieta, L.; Perez Contin, M. J.; Calderon Duque, T.; Aparicio Medrano, C.; Duran Gimenez-Rico, H. J.; Martinez Sarmiento, J., and Alvarez Fernandez-Represa, J. (Servicio de Cirugia I, Hospital Universitario San Carlos, Madrid, Espana). Value of tonometry in postoperative high risk patients with digestive surgery. *Revista Espanola De Enfermedades Digestivas*. 1999 Feb; 91(2):117-24.
Abstract: Intramucosal pH (pHi) in splanchnic organs is a reliable index of local tissular perfusion, and can be measured by tonometry. At the Surgical Intensive Care Unit we used tonometry to determine tissular perfusion in patients who underwent major digestive surgery. We report a prospective study of 20 patients with elective and emergency surgery. All of them underwent gastric tonometry and 10 of them, who had colonic disease, also underwent sigmoid tonometry. The values below pHi = 7.30 were associated with increased morbidity and mortality
16. Abakumov, M. M.; Kostiuhenko, L. N., and Kudriashova, N. E. [Enteral infusion-nutritional correction of homeostasis in patients with postburn cicatricial stenosis of the esophagus and stomach]. [Russian]. *Vestnik Khirurgii Imeni i - i - Grekova*. 1999; 158(5):30-30.
Abstract: The metabolic status was studied in 67 patients with postburn cicatricial strictures of the esophagus (39) and of the pyloric part of the stomach (28). The aim of the work was to find the methods of enteral nutrition with special mixtures. The composition of the mixtures must be close to that of the chyme. In addition to changes of the standard parameters (pH, enzymatic and electrical activity) the assessment of the state of

the digestive tract included the estimation and description of certain disorders in the system of heterophasic hydrolysis in the gastrojejunal tract (enzyme activity in fractions of the duodenal juice, enzyme sorption on the floccular structures) in the both categories of the patients. The authors recommend to treat such patients with the special mixtures "Nutrichim" or using the new corrector "Flokozim"

17. Woolf, A. D. and Shaw, J. S. (Children's Hospital, Boston, Massachusetts 02115, USA. woolf@a1.tch.harvard.edu). Nail primer cosmetics: correlations between product pH and adequacy of labeling. *Journal of Toxicology - Clinical Toxicology*. 1999; 37(7):827-32.
Abstract: BACKGROUND: We have previously reported on injuries suffered by young children exposed to methacrylic acid-containing nail primers and the need for public education efforts concerning this potential household hazard. However, some primers contain alternative ingredients, which may or may not pose the same risk; product labeling information is variable and may be confusing to consumers. OBJECTIVE: To investigate the relationship between pH of different primer products, product contents, and appropriateness of product labeling and packaging. METHODS: Twenty-three commercially available primers were grouped by product contents: (methacrylic acid vs others). Product pH was measured and product labels were scored on 7 warning points: "poison and/or corrosive," a "caution to avoid contact and/or to use a barrier when handling the product," a "skin first aid," and "eye first aid," an "ingestion first aid," a caution to "keep out of reach of children," and a "in emergency, contact a poison center." A summative "global hazard notification score" was calculated for each product. Data were analyzed using correlations and the two-sample t-test. RESULTS: None of 23 products tested were contained in a child-resistant container and none included all 7 label items. Product pH ranged from 1.90-8.55 (mean pH 4.59 +/- 1.99); 20 products had pH < 7.0. Only 1 product advised, in the event of a poisoning, that a poison center be contacted. Of 20 acidic products, only 7 alerted users that the contents could cause burns. The mean global hazard notification score (MAX = 7) was 3.6; global hazard notification score did not correlate with pH. Methacrylic acid-containing products had a lower pH (mean 3.43 +/- 0.78) than those without methacrylic acid (mean 5.34 +/- 2.18), p = 0.008. When the primer bottle was separated from the rest of the packaging which comprised the artificial nail "kit," 50% of products lost all of their warning information. CONCLUSIONS: Most, but not all, artificial nail primers analyzed in this study were highly acidic. Labeling and packaging of many nail primers are inadequate, given the potential of methacrylic acid in these products to cause burns and the toxicity of most nail primers. We agree with the Consumer Product Safety Commission's recently proposed rule to require cosmetic manufacturers to repackage methacrylic acid-containing household products in child-resistant containers. We also urge manufacturers to alert consumers to the hazards of nail primers by better labeling. Manufacturers should also investigate the feasibility of either substituting other chemicals or lowering the concentration of methacrylic acid
18. Gerard, M.; Louis, V.; Merle, H.; Josset, P.; Menerath, J. M., and Blomet, J. (Service d'Ophtalmologie, Centre Hospitalier Universitaire de Fort de France, Hopital Pierre Zobda Quitman, BP 632, 97261 Fort de France Cedex). [Experimental study about intra-ocular penetration of ammonia]. [French]. *Journal Francais d Ophthalmologie*. 1999 Dec; 22(10):1047-53.
Abstract: PURPOSE: The seriousness of ocular alkali burn depends on how quick the alkali enters the eye. We report the results of an experimental study on intra-ocular penetration of ammonia. MATERIALS AND METHODS: This study included 23 eyes of New Zealand albino rabbits, burned for 1 minute by 100 microl of a solution titrating 15.3% ammonia. A pH meter probe inserted into the anterior chamber measured pH every 5 seconds. Experiments were carried out within 1, 3, 5, 10 and 30 minutes. An anterior chamber puncture was performed at the end of experiments, after 1, 3, 5, and 10 minutes, for measuring the ammonia concentration in the anterior chamber. RESULTS: pH increased 1 to 3 minutes after applying ammonia on the cornea, until a maximum 10, 5 to 6 minutes later, followed by an exponential decrease. After 30 minutes, pH was still higher than physiological pH, and the ammonia concentration was low. The penetration-ratio of ammonia through cornea

was about 11%. Measured pH differed from pH calculated from the concentration of ammonia. CONCLUSIONS: The difference between measured and calculated pH evidences chemical reactions. The two pH increases interspersed with a plateau prove the existence of 2 successive acido-basic chemical reactions between ammonia and 2 sorts of acid. Also, the density of protein uptake can be calculated from ammonia. This suggests an interesting avenue of research as protein density can be related in the eye with the pK of the base, and thus foresee the potential danger of a base to biological tissues

19. Gerard, M.; Merle, H.; Ayeboua, L., and Richer, R. (Service d'Ophthalmologie, Centre Hospitalier Universitaire de Fort de France, Hopital Pierre Zobda-Quitman, Martinique French West Indies). [Prospective study of eye burns at the Fort de France University Hospital]. [French]. *Journal Francais d Ophthalmologie*. 1999 Oct; 22(8):834-47.
Abstract: PURPOSE: We report the results of a three-years prospective study focusing on ocular alkali burns conducted in the University hospital of Fort de France (French West Indies). PATIENTS AND METHODS: This case record survey included all alkali burns evaluated by ophthalmologists in the emergency unit of the Fort de France hospital. All recruited patients were either called to identify the alkali (pH determined with a Prolab pH-meter) or underwent an anterior chamber puncture showing evidence of an aqueous humor pH above 8. The recorded data were: age, gender, cause of burn, in case of aggression the relation between the victim and the aggressor, initial clinical findings, Ropper Hall classification. The therapeutic protocol was initiated according to this classification. The course of the ocular burn was noted. Economical and medicolegal consequences were assessed from duration of off work time and from information provided by the public prosecutor respectively. RESULTS: Twenty-four patients who had 39 burned eyes were included. Most ocular burns (18) were caused by aggressions with Alkali (ammonia, pH = 12.8). Most victims were men accused of adultery. In the West Indies, Alkali is thought to have power to drive away evil spirits. Most victims were young men (mean age 42 years). Eight court suits have been filed and in 5 cases the judge dismissed the charge. In 13 eyes, the delay to the first ocular wash was 30 minutes and resulted in serious ocular burn (Ropper Hall class 3 or 4). After application of the therapeutic protocol, 6 of these eyes recovered in an average 55 days; 3 required limbal autograft, 2 were successful. Three of these severe burns were complicated by spontaneous perforation (1 eye), atrophy (1 eye), and leucoma (1 eye). One patient was lost to follow-up. All minor ocular burns (Ropper Hall class 1 and 2) healed within an average 12 days (range 3-38 days). CONCLUSION: Particular circumstances of ocular alkali burns in Martinique (French West Indies) have been indentified in this study which established the seriousness of these burns and their social and sometimes legal consequences. The importance of prevention is emphasized. It would seem that minor ocular alkali burns do not require a treatment duration longer than 15 days. Finally, the clinical data reported in this study show that a delay of several minutes is required for the development of severe ocular alkali burns
20. Reitz, C.; Breipohl, W.; Augustin, A., and Bours, J. (Institute for Experimental Ophthalmology, University of Bonn, Germany). Analysis of tear proteins by one- and two-dimensional thin-layer isoelectric focusing, sodium dodecyl sulfate electrophoresis and lectin blotting. Detection of a new component: cystatin C. *Graefes Archive for Clinical & Experimental Ophthalmology*. 1998 Dec; 236(12):894-9.
Abstract: BACKGROUND: Isoelectric focusing (IEF) of tear proteins has not yet been carried out in a satisfactory way. Two-dimensional (2D) electrophoresis, especially in the combination of IEF with SDS, is able to differentiate between proteins in detail. The purpose of this study was therefore to analyze tear proteins by 1D IEF alone and in combination with a 2D pattern, and by IEF followed by lectin staining. METHODS: Ampholines, covering a broad range from pH 3 to pH 10, were applied. After IEF, semi-dry blotting and incubation with a group II lectin and two group V lectins was performed. RESULTS: Tear proteins could be separated into 31 single bands. Tear-specific pre-albumin (TSPA), lactoferrin, sIgA, IgG and lysozyme were found to be main components. Isoelectric points (IEPs, pls) of all proteins separated were determined by

comparison with IEF standards. 2D patterns of IEF and SDS electrophoresis were obtained for the main subunit components of lactoferrin, sIgA, TSPA, and lysozyme. An additional new component of considerable concentration was focused at pI 8.6 with a subunit MW of 14 kDa. With s-WGA a component at an IEP of 5.2 was visualized, representing transferrin. With SNA, lactoferrin stained as a sharp main band at pI 5.1 with three additional weaker bands at IEPs from 4.8 to 4.9. At IEPs between 4.4 and 6.1, multiple components of sIgA were stained with MAA. The sugar specificity of transferrin at pI 5.2 was beta-GlcNAc. Lactoferrin showed glycation with NANA-alpha-2-6-Gal or NANA-alpha-2-6-GalNAc, whereas the sugar specificity of sIgA was NANA-alpha-2-3-Gal. CONCLUSIONS: The investigative strategy applied here, including IEF alone, in combination with SDS-electrophoresis, and SDS-electrophoresis followed by lectin staining proved to be a reproducible method for tear protein analysis of hitherto unexperienced capacity. Lectin-stained bands of native tear proteins are not uniformly glycosylated by one sugar residue, but show various sugar specificities. IgA as a whole molecule is specifically glycosylated with NANA-alpha-2-3-Gal

21. Yamada, M.; Kawai, M.; Mochizuki, H.; Hata, Y., and Mashima, Y. (Department of Ophthalmology, Keio University School of Medicine, Tokyo, Japan. yamadam@med.keio.ac.jp). Fluorophotometric measurement of the buffering action of human tears in vivo. *Current Eye Research*. 1998 Oct; 17(10):1005-9.
Abstract: PURPOSE: The buffering action of human tears is thought to be important to keep its pH constant. We measured the change in pH in the precorneal tear film in vivo when the acidic solution is challenged, using a fluorophotometric technique. METHODS: Twelve eyes from 6 healthy subjects were entered in this study. Each subject was pretreated with either one drop of 0.4% oxybuprocaine for once (light anesthesia), three times (deep anesthesia), or none (controls). The measurement was initiated by instilling 20 microl of 0.067 M phosphate buffer at pH 5.5 containing 2 mM bis-carboxyethyl-carboxyfluorescein free acid, a pH sensitive dye, into the subject's eye. The pH was determined by the ratio of fluorescent intensities at two excitation wavelengths (490 and 430 nm). pH recovery time (PHRT) as defined by the time required for pH to reach 95% of pH at equilibrium was used for the marker of tear buffering action. Tear turnover rate was also determined using the fluorescent decay curve at 430 nm, which was independent of pH, but dependent on dye concentration. RESULTS: Immediately after the instillation, the pH value in the tear film was around 6.0-6.5 in all cases. The tear film rapidly became more alkaline, reaching its normal value in 2.3 +/- 0.5 min in untreated eyes. The pretreatment with 0.4% oxybuprocaine retarded the neutralization process. A single regression analysis revealed that the PHRT had a significant negative correlation with the tear turnover rate ($r = -0.78$). CONCLUSIONS: Our results suggest that the neutralization process of tears largely depends on the tear turnover rate. The buffering action of tears in vivo consists of the tear turnover as well as its chemical buffering capacity
22. Gasyimov, O. K.; Abduragimov, A. R.; Yusifov, T. N., and Glasgow, B. J. (Departments of Pathology and Ophthalmology, UCLA School of Medicine, 100 Stein Plaza, Los Angeles, CA 90095, USA). Structural changes in human tear lipocalins associated with lipid binding. *Biochimica Et Biophysica Acta*. 1998 Jul 28; 1386(1):145-56.
Abstract: Structural and conformational changes in tear lipocalins were detected in association with ligand binding and release. Circular dichroism measurements demonstrated that ligand binding induces beta structure formation, aromatic side chain asymmetry, and a more rigid state in tear lipocalins (TL). The exposure of the tyrosyl component is less in apo-TL than in holo-TL. The sole tryptophan residue, Trp17, is buried in both holo- and apo-TL. The steady state exposure of Trp17 is the same in holo- and apo-TL, but the dynamic exposure is two-fold greater in apo-TL. Maneuvers to unfold the protein with urea or incubation in an acidic environment resulted in increased exposure of aromatic amino acids. Electron paramagnetic resonance studies verified that lipids are liberated from TL in an acidic environment. Acidic pH promotes conformational changes in TL involving aromatic residues, particularly the conserved residue Trp17. These changes are associated with lipid

release. The liberation of lipid from the cavity of TL under acidic conditions involves a molten globule state of the protein. We postulate that TL, exposed to the steep surface pH gradient that exists at lipid-aqueous interfaces, would release lipid in association with a molten globule transition. The data suggest a plausible regulatory mechanism for lipid delivery from lipocalins at the tear film surface

23. McNamara, N. A.; Polse, K. A., and Bonanno, J. A. (Morton D. Sarver Laboratory for Cornea & Contact Lens Research, University of California, Berkeley, USA). Fluorophotometry in contact lens research: the next step. *Optometry & Vision Science*. 1998 May; 75(5):316-22.
Abstract: BACKGROUND: Fluorophotometry can be used to quantify changes in epithelial permeability (Pdc), corneal pH, and tear exchange (T95; time to deplete 95% of a fluorescent dye from beneath a contact lens) associated with contact lens wear. Using fluorometric procedures, we present previously reported data in order to review the effects of contact lens wear on Pdc and pH. We also introduce a new method for measuring tear exchange beneath a soft contact lens and present preliminary data. METHODS: Pdc was assessed on 32 subjects after 1 h of closed-eye soft contact lens wear. Stromal pH was assessed on 21 subjects wearing lenses with a range of different oxygen transmissibilities (Dk/L). T95 was assessed on 7 subjects who wore disposable lenses. Pdc estimates were derived by measuring the rate at which topically applied fluorescein crossed the epithelial barrier from the tears; corneal pH was quantified by alternately exciting a fluorescein-loaded cornea with two wavelengths of blue light and calculating the fluorescence intensity ratio (490/450 nm), which is pH-sensitive; and the T95 was estimated by applying 2 microliters of FITC-Dextran to the posterior surface of a soft contact lens and the monitoring the exponential decay of dye under the lens. RESULTS: On average, 1 h of closed-eye contact lens wear caused a 41% increase in Pdc compared to the control eye. Corneal pH varied directly with a decrease in Dk/L. On average the T95 under contact lenses (mean = 29 min) was slow compared to normal rates with no lens (approximately 5 min). CONCLUSIONS: Fluorophotometry can be used to quantify some interesting effects associated with contact lens wear, and the use of these techniques may provide new information about the impact of contact lens wear on corneal structure and function
24. Yamataka, A.; Pringle, K. C., and Wyeth, J. (Department of Surgery, Wellington School of Medicine, New Zealand). A case of zinc chloride ingestion. *Journal of Pediatric Surgery*. 1998 Apr; 33(4):660-2.
Abstract: Zinc chloride is a powerful corrosive agent. Reports of zinc chloride ingestion are uncommon, and there is little information about its toxicity and management. The authors report the clinical course of a 10-year-old girl who accidentally ingested an acid soldering flux solution (pH, 3.0; zinc chloride, 30% to < 60%). Systemic effects after the ingestion were unremarkable except for lethargy. Thus, chelation therapy was not considered. Severe gastric corrosion was caused by local caustic action. An antral stricture of the stomach approximately 3 weeks after the ingestion developed, and she underwent a modified Heineke-Mikulicz antropyloroplasty. Postoperatively, she made an uneventful recovery. On follow-up, although she was tolerating a normal diet, results of a barium meal showed her stomach to be totally aperistaltic. Results of a nuclear medicine study showed moderately delayed gastric emptying. Careful long-term follow-up is necessary, because there is potential risk for malignancy in the damaged stomach
25. Gonul, B.; Erdogan, D.; Bilgihan, K., and Ozogul, C. (Gazi University, Faculty of Medicine, Department of Physiology, Histology, Ankara, Turkey). The effects of artificial tear solutions on wound healing in full thickness corneal incisions. *Acta Physiologica Hungarica*. 1997; 85(3):251-8.
Abstract: Carbopols (carbomer, polyacrylic acid) are appropriate for ophthalmic use as an artificial tear in the form of viscous aqueous solutions. Carbopol 940 preparations were developed as long-lasting artificial tears for the relief of dry eye syndrome and traumatic injury. We identified the 15 days local treatment effects of two artificial tear solutions by wound strength and histologic examination of the incision wounds of rabbit corneas by comparing these results with the controls. Three layers of control corneas were regular. The untreated but wounded corneas epithelium

and stroma were completely irregular. Both treated eyes had thinner epithelization in the incision site compared to control unwounded eye. Wounds treated with A preparation (viscotiers) had vacuoles and numerous inflammatory cells and remarkable oedematous regions but B preparation (Thilo-Tears) treated wounds had inflammatory cells and oedematous regions less than the other group. The wound strengths of gel treated wounds were bigger than those of controls. A considerable result in wound strength and better wound healing was also obtained in B preparation treated group because of the arrangement of the pH and tonicity at the Thilo-tears gel preparation

26. Molloy, M. P.; Bolis, S.; Herbert, B. R.; Ou, K.; Tyler, M. I.; van Dyk, D. D.; Willcox, M. D.; Gooley, A. A.; Williams, K. L.; Morris, C. A., and Walsh, B. J. (Australian Proteome Analysis Facility, Macquarie University, Sydney). Establishment of the human reflex tear two-dimensional polyacrylamide gel electrophoresis reference map: new proteins of potential diagnostic value. *Electrophoresis*. 1997 Dec; 18(15):2811-5.
Abstract: To understand the changes in protein expression associated with various physiological states as well as the development of pathological eye disease, we have begun to map the protein components of normal human reflex tears. An analytical reference map of normal human reflex tears was created using two-dimensional polyacrylamide gel electrophoresis (2-D PAGE) with pH 3.5-10 immobilized pH gradients (IPGs). Micropreparatively loaded gels were transferred to polyvinylidene difluoride (PVDF) and analysed by a combination of N-terminal sequence tagging and amino acid compositional analysis. Thirty spots were sequence tagged, resulting in identification of six different proteins (lipocalin, lysozyme, lactotransferrin, zinc-alpha-2 glycoprotein, cystatin S, cystatin SN) that matched to entries in the SWISS-PROT database. A group of N-terminally blocked proteins was clearly identified from SWISS-PROT by amino acid analysis, isoelectric point (pI) and molecular weight (Mr). A number of highly expressed protein components remain unidentified despite being subjected to amino acid analysis and Edman sequencing. A majority of the abundant proteins showed varying degrees of charge heterogeneity attributed to post-translational processing such as glycosylation and N-terminal truncation. We have identified a previously undescribed protein that we have named lacryglobin. This protein displays strong homology with mammaglobin, a protein overexpressed in breast cancer. The discovery of this homologue in tears offers the potential for disease diagnosis by screening tear fluid proteins
27. Varnell, R. J.; Maitchouk, D. Y.; Beuerman, R. W.; Salvatore, M. F.; Carlton, J. E., and Haag, A. M. (Department of Ophthalmology, Louisiana State University Medical Center School of Medicine, New Orleans, USA). Analysis of rabbit tear fluid using capillary electrophoresis with UV or laser-induced fluorescence detection. *Journal of Capillary Electrophoresis*. 1997 Jan-1997 Feb 28; 4(1):1-6.
Abstract: In preliminary studies of the development of tear analysis methodology that may eventually be useful in the clinical setting, the authors evaluated various protocols for analyzing rabbit tears by capillary zone electrophoresis (CZE). Conditions included the use of a 50-mM monosodium phosphate buffer, pH 2.5, or a 400-mM sodium borate buffer, pH 8.9, both with ultraviolet (UV) detection, as well as a 50-mM borate buffer, pH 8.5, with laser-induced fluorescence (LIF) detection of ATTO-TAG CBQ (Molecular Probes, Inc., Eugene, OR, U.S.A.) derivatized tears. All CZE analyses were performed with a P/ACE System 2100 instrument equipped with System Gold software (Beckman Instruments, Fullerton, CA, U.S.A.), using a 50 microns x 57 cm (50 cm to the window) fused-silica capillary, at 25 degrees C, with constant voltage of 20 kV for UV detection and 11 kV for LIF detection. Tear samples were collected from normal rabbit eyes by means of 10-microL glass micropipets. The volume of each sample was approximately 2 microL. Analysis using the phosphate buffer with UV detection produced as many as 35 peaks in each sample, of which 11 peaks were readily discerned. This compared favorably with sodium dodecyl sulfate-polyacrylamide gel electrophoresis (SDS-PAGE) analysis, which produced 32 bands with silver staining and 11 quantifiable bands with Coomassie brilliant blue staining. Many of the tear protein components have yet to be identified. CZE analysis with the high-ionic-strength borate buffer with UV detection produced only four peaks, and the low-ionic-strength borate buffer with LIF detection produced only six peaks. CZE

analysis was completed in less than 1 hr, compared with 7-8 hr for SDS-PAGE. In summary, CZE analysis of tear fluid is comparable to CZE analysis of other bodily fluids and shows great potential for use in clinical diagnosis as well as for enhancing our understanding of the cellular actions of tears on the front of the eye

28. Beiran, I.; Miller, B., and Bentur, Y. (Department of Ophthalmology, Rambam Medical Center, Bruce Rappaport Faculty of Medicine, Technion, Israel Institute of Technology, Haifa, Israel). The efficacy of calcium gluconate in ocular hydrofluoric acid burns. *Human & Experimental Toxicology*. 1997 Apr; 16(4):223-8.
Abstract: 1. Although calcium gluconate (CG) is recommended in the treatment of hydrofluoric acid (HF) eye burn its efficacy seems to be controversial, and controlled human or animal studies are limited. The study's objective is to compare the efficacy of 1% CG and normal saline irrigation for the treatment of HF eye injury in animals. 2. 0.05 ml 2% HF was instilled to anesthetized rabbit's eyes. One minute later, four treatment groups were studied: (1) irrigation with normal saline followed by topical antibiotics, corticosteroids and cycloplegics for 48 h (n = 10); (2) irrigation with 1% CG followed by the same topical treatment (n = 9); (3) as group 1 and 1% CG drops over 48 h (n = 10); (4) as group 3, and injection of 1% CG subconjunctivally after irrigation (n = 9). 3. Corneal erosion area, corneal haziness, conjunctival status, vascularization (pannus) and acidity were assessed before injury, immediately after initial treatment and 1, 2, 7 and 14 days thereafter by slit lamp aided by fluorescein staining. 4. Conjunctival pH dropped from 6.0-6.5 to 2.5-3 after injury and increased to 6-6.5 after irrigation. Corneal erosion: smaller in groups 2, 3, significantly so at 2 days, but not different at 14 days. Corneal haziness: more severe in group 4, at 14 days, insignificant. Conjunctival damage: significantly worse in group 4 at 2, 7 and 14 days. Pannus appeared in 2-4 eyes in each group. 5. It seems that for HF injury 1% CG did not have any significant advantage over saline irrigation and topical treatment only. It might have some initial and temporary effect on healing process especially that involving erosion. Given subconjunctivally, 1% CG may be toxic and worsens clinical outcome
29. Yamada, M.; Mochizuki, H.; Kawai, M.; Yoshino, M., and Mashima, Y. (Department of Ophthalmology, Keio University School of Medicine, Tokyo, Japan). Fluorophotometric measurement of pH of human tears in vivo. *Current Eye Research*. 1997 May; 16(5):482-6.
Abstract: PURPOSE: To measure the pH in the precorneal tear film of humans in vivo using a pH-sensitive fluorescent dye, bis-carboxyethyl-carboxyfluorescein (BCECF). METHODS: The measurement was initiated by instilling 1 microliter of 2 mM BCECF solution into the subject's eye. The pH was calculated by measuring the ratio of fluorescent intensities at two excitation wavelengths (490/430 ratio), which was dependent on pH, but independent of the dye concentration and other variables. The tears of the same subject were then collected and loaded on to a micro pH-meter to ensure the accuracy of the measurement. RESULTS: The mean pH values of 40 eyes from 20 healthy volunteers was 7.50 (SD +/- 0.23), which corresponded well with those measured by the micro pH-meter. CONCLUSIONS: The method described was useful in measuring the pH of the precorneal tear film of humans with minimal invasion
30. McConville, P.; Pope, J. M., and Huff, J. W. (School of Physics and Cornea and Contact Lens Research Unit, University of New South Wales, Sydney, Australia). Limitations of in vitro contact lens dehydration/rehydration data in predicting on-eye dehydration. *CLAO Journal*. 1997 Apr; 23(2):117-21.
Abstract: PURPOSE: The purpose of this study was to use in vitro dehydration and rehydration data to model the predicted hydration changes that may occur as a soft contact lens loses and gains water on the eye between blinks. METHODS: Using a recent in vitro data set for four lens materials dehydrated and rehydrated in saline, we derived a mathematical model to describe dehydration and rehydration time courses. The model further combined the dehydration and rehydration data iteratively, as a function of blink frequency, and pre-lens break-up time. RESULTS: The

model showed that reduced break-up times or decreased blink frequencies significantly affected dehydration rates and steady state dehydration for lenses of a variety of water contents. However, the model did not agree with the commonly accepted clinical belief that high water content lens materials dehydrate more than low water content materials. DISCUSSION: The discrepancy of the model with historical observations may be accounted for by one or more of the following factors, which were not accounted for in the present model: 1) temperature dependent dehydration (as a lens is taken from a room temperature vial and warmed when placed on the eye); 2) the colloid osmotic pressure, ionicity, pH, and chemical potential of tears (compared to saline); and 3) dehydration by other non-evaporative mechanisms

31. Mrvos, R. and Krenzelok, E. P. Hair relaxers: lack of morbidity despite high pH. *American Journal of Emergency Medicine*. 1997 Mar; 15(2):216.
32. Maudgal, P. C. (Ophthalmological Clinic, U.Z. Leuven). Ocular burn caused by soft brown soap. *Bulletin De La Societe Belge d Ophtalmologie*. 263:81-4, 1996.
Abstract: PURPOSE: To report the danger of serious chemical ocular burn caused by common household soap. CASE HISTORY: A 20 year old male developed an extensive burn of the right eye after the commonly used soft brown soap (also called floor soap) fell into his face and right eye. The burn caused conjunctival ischemia and necrosis. The cornea was oedematous and denuded of epithelium. The pH of the soap was 11.8. The patient received treatment for alkali burn of the eye. Stem cell transplantation was needed to heal the corneal surface defect. Scar formation and peripheral neovascularisation have reduced the visual acuity to counting fingers at 75 cm. CONCLUSION: This case of serious alkali burn caused by the common soft brown soap demonstrates the potential hazard to the eyes. The manufacturer was sought to write the pH and a warning on the exterior of the container that the "soft brown soap" may cause serious ocular injury
33. Simon, M.; Coiffard, L. J.; Rivalland, P., and De Roeck-Holtzhauer, Y. (Laboratoire de Pharmacie industrielle et Cosmetologie, Universite de Nantes-CAEC, Saint-Herblain). [Determination of physicochemical characteristics and evaluation of decontaminating efficacy and in vitro safety of cleaning products for contact lenses]. [French]. *Journal Francais d Ophthalmologie*. 1996; 19(12):738-42.
Abstract: PURPOSE: This work aims to characterize products designed for cleaning contact lenses and particularly their physicochemical properties, their efficiency and their ocular irritancy potential compared to the main requirements of eye-washes. MATERIAL AND METHODS: The physicochemical controls include pH determination, viscosity and freezing point depression. In addition, we carried out the hydrogen peroxide assay for products containing this active substance. A microbiological control was performed when opening the product and after simulation of a 21-day aging. We determined the decontaminating efficacy of the products on four bacterial strains and a fungal strain. Finally, we tested their ocular allowance by an in vitro test. RESULTS: The pH values obtained ranged from 3.2 (oxygenated water solutions) to 7.6. The viscosity was close to a water solution one (about 1 centipoise). The different assays showed hydrogen peroxide content similar to that stated on the package: rate averaged to 3% and was negligible after neutralization. At opening and after simulation the bacteriological quality was excellent. Finally, decontaminating efficiency against germs was very good for the products tested. The products were classified as non-irritant by the ocular irritancy test. CONCLUSION: The results obtained show that the products tested met the reference criteria, particularly eye-wash criteria
34. Sack, R. A.; Sathe, S.; Hackworth, L. A.; Willcox, M. D.; Holden, B. A., and Morris, C. A. (Department of Biological Sciences, State College of Optometry, State University of New York, NY 10010, USA). The effect of eye closure on protein and complement deposition on Group IV hydrogel contact lenses: relationship to tear flow dynamics. *Current Eye Research*. 1996 Nov; 15(11):1092-100.

Abstract: PURPOSE: This study was designed to determine the effect of overnight eye closure on the rate and composition of protein deposition on high water content ionic matrix soft contact lenses (Group IV SCLs) and to extrapolate from this data information on the probable change in the rate of reflex-type tear secretion associated with eye closure. METHODS: Group IV SCLs were temporally sampled after equivalent periods of wear under closed eye (C) or open eye (O) conditions. Lenses were rinsed in saline and the majority of the tightly bound protein extracted at 90 degrees C in 40% urea, containing 1% SDS, 1 mM DTT, 100 mM Tris-HCl (pH 8.00). Residual protein was determined by Coomassie staining of the extracted lenses and densitometric analysis. Extracted protein was quantitated and separated by SDS-PAGE. Gels were either stained with Coomassie blue or reversibly stained with imidazole-zinc and blotted. Blots were PAS stained, or lectin and antibody probed for glycoproteins, secretory IgA (sIgA), IgG, lysozyme and complement C3. Laboratory simulated deposition studies were carried out on unworn lenses exposed to HPLC purified lysozyme. RESULTS: The protein in the saline rinse, to a large degree mirrored the composition of tear fluid in which the lens had been residing (O or C). This would suggest that the saline wash consists of residual tear fluid and loosely adherent protein. In contrast, the urea extracts were highly homogeneous consisting primarily of lysozyme and to lesser extent lysozyme dimer. This supports the contention that the Group IV SCL functions in the eye much as cationic exchange resin selectively absorbing lysozyme. C extracts also proved relatively enriched in trace amounts of sIgA, IgG and complement C3 and its breakdown products. High levels of C3 and C3 breakdown products were specifically recovered only in the C worn lens extracts from a subject experiencing unilateral contact lens associated corneal infiltrates from the affected eye. In all subjects, markedly less protein (lysozyme) was recovered in urea extracts of lenses exposed to 7-8 h of closed eye as compared to open eye wear (0.20 +/- .08 versus 0.79 +/- .15 mg/lens (n = 6)). Temporal studies further revealed that deposition was linearly related to duration of wear during the initial phase of conditioning film formation giving rise to rate constants for lysozyme deposition of 2.2 +/- 0.29 (n = 5) and 0.20 +/- 0.06 microgram/min (n = 4) under open and closed eye conditions respectively. With further wear, deposition eventually reached a steady state. Under laboratory conditions, lysozyme was much rapidly and quantitatively removed from solution in a manner following a hyperbolic plot. This suggests that during the initial phase of deposition the rate of deposition is limited by the capacity of the tear fluid to deliver lysozyme to the lens surface under these two extremes of conditions. CONCLUSIONS: Eye closure profoundly affects the rate of lysozyme deposition on Group IV hydrogels and the composition of minor biofilm constituents in a manner that could affect biocompatibility. Findings support the contention that eye closure results in a > 90% reduction in the rate of reflex-type tear secretion

35. Bautista, A.; Varela, R.; Villanueva, A.; Estevez, E.; Tojo, R., and Cadranel, S. (Departamento de Pediatría, Hospital General de Galicia, Clínico Universitario, Universidad de Santiago, Santiago de Compostela, La Coruña, Spain). Motor function of the esophagus after caustic burn. *European Journal of Pediatric Surgery*. 1996 Aug; 6(4):204-7.

Abstract: During the subacute and chronic phases of esophagitis due to ingestion of a caustic substance, the patient commonly displays stricture, esophageal rigidity and dysphagia. We used esophageal manometry, radiology, pH monitoring and ^{99m}Tc scintigraphy to investigate esophageal motor function in 25 children (mean age 24 +/- 7 months) with chronic esophagitis after second- and/or third-degree caustic burns. The results were compared with those for a control group of 12 children (mean age 32 +/- 19 months) under surveillance for suspected gastroesophageal reflux (GER) but for whom this pathology was later ruled out. Seventeen (68%) of the lesioned-group children showed esophageal dysfunction as revealed by monitoring of pH over a 24-hour period. Over this period, the mean percentage of time with pH below 4 was 19 +/- 10%, the mean number of reflux episodes was 48 +/- 52, the mean number of reflux episodes lasting longer than 5 min was 10 +/- 5, and the mean duration of the longest reflux episode was 51 +/- 21 min. Manometry indicated that, in the lesioned group, an average of 77 +/- 18% of peristaltic waves were nonpropulsive, while the mean Esophageal Work Index (number of propulsive waves per hour x mean maximum pressure developed during propulsive waves) was 227 +/- 192 units. All of the above means were significantly different (p < 0.01) from the corresponding control-group

means. Esophageal strictures were observed in 60% (15) of the children. In 2 cases it was minimal, 2 cases moderate and 11 cases had severe strictures. ^{99m}Tc scintigraphy indicated that esophageal transit was slightly delayed in four, moderately delayed in five and severely delayed in 16 of the lesioned-group subjects. There was close correspondence between the results of manometry and scintigraphy as regards severity of esophageal dysfunction. These results indicate that motility disturbances and GER are very frequent sequelae of caustic burns of the esophagus, and should be taken into account when evaluating symptoms and deciding on the therapeutic strategy (including diet) to be followed

36. Dickinson, D. P. and Thiesse, M. (University of Texas, Houston Health Science Center, Department of Basic Sciences 77225, USA). cDNA cloning of an abundant human lacrimal gland mRNA encoding a novel tear protein. *Current Eye Research*. 1996 Apr; 15(4):377-86.
Abstract: An abundant 1.05 kb human lacrimal gland mRNA has been characterized by cDNA cloning. It encodes a predicted 180 residue, 20546 Da secreted protein, with a charge of +11 at pH 7 and 24.5% proline, designated as Basic Proline-rich Lacrimal Protein (BPLP). Southern blot analysis is consistent with a single BPLP gene. BPLP lacks any distinct repetitive structure, and is unrelated to the salivary proline-rich protein super-family. The pre-proprotein shows modest overall similarity to a superfamily comprising human PRPb, the mouse MSG proteins, and rat VCS-alpha 1, VCS-beta 1 and submandibular apomucin. BPLP also contains a domain with similarity to the Zp2 protein domain found in several otherwise unrelated proteins. Northern blot analysis indicated that the BPLP gene is also expressed at modest levels in the human submandibular gland, and in situ hybridization demonstrated expression of BPLP in the secretory endpieces of the human lacrimal gland. The BPLP cDNA clone defines a new human tear protein, and should provide a useful phenotypic marker of differentiation in in vitro studies of lacrimal gland function
37. Yano, K.; Hosokawa, K.; Kakibuchi, M.; Hikasa, H., and Hata, Y. (Department of Dermatology, Osaka University School of Medicine, Japan). Effects of washing acid injuries to the skin with water: an experimental study using rats. *Burns*. 1995 Nov; 21(7):500-2.
Abstract: A skin acid injury model has been constructed using SD rats and 1N HCl. The changes over time, with particular attention to subcutaneous tissue pH, were recorded and included a comparative study of the effect of washing with water at 1, 3 and 10 min after injury, on subcutaneous tissue pH. After inflicting an acid injury, the subcutaneous tissue pH of control animals reached its minimum value at the seventh minute, and had not recovered to the pre-experimental level by the 60th minute. In the group of rats which was washed at 1 min, the pH did not drop below 7.5, it remained virtually unchanged. In the group washed at 3 min, the pH declined slightly, but subsequent to washing, the pH increased gradually. In the group washed at 10 min, the changes in pH were almost the same as those in the untreated group. These results indicated that if washing was carried out before the subcutaneous tissue pH level reached a minimum value, any remaining acid on the skin surface could be washed away, effectively suppressing the subsequent fall in pH
38. Katsu, K. and Yabe, S. (Third Division of Internal Medicine, Saitama Medical School, Japan). Comparison of gastric mucosal surface pH response times after intravenous administration of histamine2-receptor antagonists. *Clinical Therapeutics*. 1995 May-1995 Jun 30; 17(3):433-10.
Abstract: Gastric mucosal surface pH was measured endoscopically in patients with peptic ulcer, erosive gastritis, or nonulcer dyspepsia following intravenous administration of either 200-mg cimetidine, 50-mg ranitidine, or 40-mg famotidine. The mean baseline pH in the three treatment groups before drug administration ranged from 0.85 to 0.99, with no significant difference between groups. Following treatment with cimetidine, ranitidine, and famotidine, the mean response times for the mucosal surface pH values to increase to 3.5 were 10.1 +/- 5.9 minutes, 11.2 +/- 6.8 minutes, and 17.3 +/- 6.7 minutes, respectively. The corresponding response times to reach pH levels of 6.0 were 16.0 +/- 9.4 minutes, 17.0 +/- 5.4 minutes, and 31.2 +/- 21.7 minutes, respectively. The response times to pH levels of 3.5 and 6.0 were significantly faster in patients who received cimetidine compared with patients who received famotidine (P = 0.0088 to pH 3.5 and P = 0.046 to pH 6.0). The

differences between cimetidine and ranitidine were not significant. These findings suggest that at recommended clinical doses, intravenous cimetidine provides rapid elevation of the gastric mucosal surface pH compared with other histamine₂-receptor antagonists. This finding may be particularly relevant in the emergency care of patients with severe peptic ulcer disease (eg, patients with gastrointestinal hemorrhage)

39. Tripathi, A.; Somwanshi, M.; Singh, B., and Bajaj, P. (Department of Anaesthesiology, R.N.T. Medical College and Associated Hospitals, Udaipur, India). A comparison of intravenous ranitidine and omeprazole on gastric volume and pH in women undergoing emergency caesarean section.[comment]. *Canadian Journal of Anaesthesia*. 1995 Sep; 42(9):797-800.
Abstract: We have compared the effect of intravenously administered omeprazole and ranitidine on gastric contents in a double-blind study in 80 consecutive women undergoing emergency Caesarean section. When the decision to perform emergency Caesarean section was made, patients were randomly assigned to receive either ranitidine 50 mg or omeprazole 40 mg intravenously. The volume and pH of the gastric contents were measured immediately after tracheal intubation and again before extubation. The gastric pH was found to be higher after omeprazole than after ranitidine immediately after intubation (5.89 +/- 1.46 and 5.21 +/- 1.36 respectively) ($P < 0.05$) and before extubation (5.97 +/- 1.38 and 5.32 +/- 1.24 respectively) ($P < 0.05$). However, the gastric volumes were comparable in both the groups. The number of patients with gastric volume > 25 ml and pH < 2.5 were 3 (7.5%) in the ranitidine group and 1 (2.5%) in the omeprazole group after intubation and none in either of the groups before extubation. We conclude that omeprazole 40 mg iv administered at the time of the decision to operate, results in higher gastric pH than ranitidine in obstetric patients undergoing emergency Caesarean section

40. Baguet, J.; Claudon-Eyl, V.; Sommer, F., and Chevallier, P. (Laboratoire Meuse Optique Contact, Bar le Duc, Biophy Research, Novacite Alpha, Villeurbanne, LPAN Universite Pierre et Marie Curie, Orsay, France). Normal protein and glycoprotein profiles of reflex tears and trace element composition of basal tears from heavy and slight deposits on soft contact lenses. *CLAO Journal*. 1995 Apr; 21(2):114-21.
Abstract: We investigated the hypothesis that lacrimal component accumulation on soft contact lenses (SCL) may be induced by an abnormal protein, glycoprotein, or trace element composition of the tear fluid. Individual tear samples were collected from healthy non-SCL wearers (normal patients) and SCL wearers grouped as either "slight-depositor" or "heavy-depositor" following SCL spoilage rate and frequency. The reflex tear proteins were analyzed by three electrophoretic procedures: sodium dodecyl sulfate-polyacrylamide gel electrophoresis (SDS-PAGE) on minigels, isoelectric focusing (IEF) on immobilized pH gradients (IPG 4-7), and two-dimensional separation combining IEF in the first dimension to orthogonal SDS-PAGE. After separation, the proteins were detected by silver staining and identified by immunologic probes. The reflex tear glycoproteins were analyzed by lectin affinity associated electrotransfer of SDS-PAGE with a panel of five biotinylated lectin probes: *Canavalia ensiformis* (Con A), *Artocarpus integrifolia* (Jacalin), glycine max (SBA), *Ulex europaeus* (UEA 1), and *Triticum vulgare* (WGA) agglutinins. The basal tear trace elements were analyzed by Synchrotron Radiation X-ray Fluorescence. Despite the highly sensitive techniques used in the study, the profiles of reflex tear proteins, glycoproteins, and trace elements appeared to vary slightly among individuals. No evident qualitative difference in reflex tear fluid related to SCL wear or deposit formation susceptibility was found. The presence or absence of a particular protein, glycoprotein, or trace element could not be correlated with a different reactivity to SCL. However, potassium and carbohydrate residues having affinity with Jacalin and WGA presented little but not significant variations.(ABSTRACT TRUNCATED AT 250 WORDS)

41. Coiffard, L.; Rivalland, P., and De Roeck-Holtzhauer, Y. (Laboratoire de Pharmacie Industrielle et Cosmetique, Universite de Nantes-CAEC). [Characteristics, stability and in vitro efficacy of cleaning products for contact lenses]. [French]. *Journal Francais d Ophthalmologie*. 1995; 18(1):33-9.

Abstract: OBJECTIVE OF THE STUDY: We characterized some market products designed for cleaning contact lenses and we compared their properties to the main requirements of eye-washes. MATERIAL AND METHODS: We performed several physicochemical controls including pH determination, viscosity with a Baume apparatus and the decreasing of the freezing point following the method described by the French Pharmacopea. In addition, we carried out certain analytical controls, concerning three active principles (thiomersal, chlorhexidin digluconate, hydrogen peroxide), at the opening of the different package and after accelerated aging. A microbiological control was performed when opening the product and after a simulation of a 5-day aging. We finally determined the efficacy of the products on four bacterial strains for tests and of deproteinizing products on artificial dust. RESULTS: The pH values obtained ranged from 4.0 (oxygenated water solutions) to 7.8. The viscosity was close to a water solution one. Contents in active substances were usually similar to those stated on the package. At opening, the bacteriological quality was excellent. But, the multidose package were highly contaminated when used. Finally decontaminating efficacy against some germs was very good for the products tested. CONCLUSION: The results obtained show that the rinsing products best answer the eye-wash criteria taken as references. Their main disadvantage is their contamination in the case of multidose packaging

42. Kahanne, L. I.; Bogi, J.; Farkas, A.; Tudos, F. H., and Imre, G. (SOTE II. sz. Szemklinika, Budapest). [Indosol--a nonsteroidal anti-inflammatory drug with therapeutic efficacy]. [Hungarian]. *Acta Pharmaceutica Hungarica*. 1994 Jul; 64(4):125-9.

Abstract: For the topical employing of nonsteroidal antiinflammatory drugs, some technological problems are to be solved. These were accomplished by the authors by preparing Indosol [indomethacin-TRIS (tromethamine) salt]. pH and osmotic pressure of Indosol eye-drops are similar to that of the tear fluid. The Indosol eye-drops have a great therapeutic efficacy. Indosol eye-drops do not alter tear film break up time (BUT) and do not inhibit reepithelization of the cornea. Indosol eye-drops proved to be useful in the treatment of the anterior segment and the uvea. The most important use is the pre- and post-treatment in intraocular surgery. Indosol eye-drops contribute to the safety of lens-extraction and lens implantation. The great bioavailability was also shown by the high indomethacin level of the aqueous humor after instillation Indosol eye-drops. It does not cause any deleterious side-effects even in long term treatments

43. Su, J. M.; Hsu, H. K.; Chang, H. C., and Hsu, W. H. (Department of Surgery, Veterans General Hospital-Kaohsiung, Taipei, Taiwan, R.O.C). Management for acute corrosive injury of upper gastrointestinal tract. *Chung Hua i Hsueh Tsa Chih - Chinese Medical Journal*. 1994 Jul; 54(1):20-5.

Abstract: BACKGROUND. It is imperative that the surgeon promptly determine the severity of any acute injury of the upper gastrointestinal (UGI) tract by caustic material ingested and the definite therapy be instituted. Prognostic factors of such injuries have not been clearly demonstrated in previous reports. Here, some prognostic factors and recommended emergency surgical indications in clinical assessment are discussed. METHODS. Forty-six patients (22 men and 24 women; age range 19 to 77 years), sustaining acute corrosive injuries to the UGI tract, were retrospectively assessed from November 1990 to May 1993. Immediate management was given to prevent shock, to identify any associated injury and to observe patency of the airway. Emergency operation was performed if any signs of peritonitis, mediastinitis or sepsis were present. Age, sex, time interval between ingestion and initial resuscitation, consciousness, peritoneal sign, shock index, pH value and [HCO₃⁻] in arterial blood gas were evaluated as prognostic factors with respect to mortality. Chi-square test with Yates' correction was used. A p value less than 0.05 was regarded as statistically significant. RESULTS. Suicide attempt by caustic ingestion was in 40 patients (87%) and ingestion was accidental in 6 (13%). Acidic injury was specified in 36 patients (78.3%). In 14 severely injured patients, emergency exploratory laparotomy with or without esophagogastrectomy was performed in 9 (19.6%), of whom 2 survived. The other five patients were treated conservatively, and all died. Overall mortality rate was 26.1% (12/46). A significantly higher mortality rate was observed in patients with age > or = 50 years, positive peritoneal sign,

shock index > 1, pH below 7.2 and bicarbonate concentration below 16 mEq/L as revealed by arterial blood gas ($p < 0.05$). CONCLUSIONS. The prognostic factors related to a higher mortality rate included age 50 years old or more, positive peritoneal sign, shock index above 1, pH below 7.2 and $[\text{HCO}_3^-]$ below 16 mEq/L in arterial blood gas. Recognition of these factors indicates further detailed study will be required to propose a caustic injury score for predicting severity. Nevertheless, emergency operation is recommended if there are positive signs of peritonitis or mediastinitis, shock index above 1, pH below 7.0 and $[\text{HCO}_3^-]$ below 10 mEq/L in arterial blood gas

44. Yano, K.; Hata, Y.; Matsuka, K.; Ito, O., and Matsuda, H. (Department of Plastic and Reconstructive Surgery, Kagawa Medical School, Japan). Effects of washing with a neutralizing agent on alkaline skin injuries in an experimental model. *Burns*. 1994 Feb; 20(1):36-9.
Abstract: In this report a skin alkaline injury model was constructed using experimental rats and 2 N NaOH. We observed the effects of washing with a neutralizing agent on the subcutaneous tissue pH at 1, 10 and 30 min after injury and compared it with water-washing groups. In comparison with the water washing group, the peak pH values following the use of the neutralizing agent were significantly higher in the 1-min washing group, and significantly lower in the 10-min and 30-min washing groups. Changes in the pH values of the subcutaneous tissue after reaching a peak showed a similar course in the 1-min washing group, whereas in the 10 and 30 min washing groups there was a significantly different rate of decrease of pH. These results indicate that although treatment with a neutralizing agent directly after injury causes harmful effects due to the neutralizing reaction with a highly concentrated alkali. Subsequently with prolonged washing there is an effective reduction of the high pH
45. --- (Department of Plastic and Reconstructive Surgery, Kagawa Medical School, Japan). Experimental study on alkaline skin injuries--periodic changes in subcutaneous tissue pH and the effects exerted by washing. *Burns*. 1993 Aug; 19(4):320-3.
Abstract: A skin alkaline injury model was constructed using rats and 2N-NaOH. The changes over time, paying special attention to subcutaneous tissue pH, were recorded and included a comparative study of the effect on subcutaneous tissue pH of washing with water at 1, 10 and 30 min after injury. After inflicting alkaline injury, the subcutaneous tissue pH reached its peak value at the 32nd minute and had not recovered to the pre-experimental level by the 90th minute. The peak pH values of the 1-, 10- and 30-min delays before washing groups were 7.97, 10.57 and 12.17, respectively. When washing was started within 1 min of injury the tissue pH values did not exceed 8.00. Washing had virtually no effect on lowering the raised pH levels when the delay between injury and the start of washing was 10 and 30 min
46. Paredes Osado, J. R.; Gras Albert, J. R.; Crespo Marco, C., and Mira Navarro, J. (Servicio de ORL, Hospital General d'Alacant (SVS)). [Our experience with caustic substance ingestion in children]. [Spanish]. *Acta Otorrinolaringologica Espanola*. 1993 Mar-1993 Apr 30; 44(2):101-5.
Abstract: We discuss the protocol followed in our Service for the diagnose, treatment and follow-up of patients younger than seven years old, diagnosed as "caustic substance ingestion". We report on 157 cases seen from 1987 to 1991, from which 14 showed severe oesophageal burnings which required further oesophageal dilatation with general or local anesthesia. The usefulness of pH-metry in this patients is also analyzed. The relatively mild degree of abrasiveness produced by bleach is also described, despite being the most frequent caustic agent in our group of patients. The usefulness of the different techniques applied for the treatment and follow-up of this patients is also discussed
47. Rout, C. C.; Rocke, D. A., and Gouws, E. (Department of Anaesthetics, University of Natal, Durban, South Africa). Intravenous ranitidine reduces the risk of acid aspiration of gastric contents at emergency cesarean section.[erratum appears in *Anesth Analg* 1993 May;76(5):1180]. *Anesthesia & Analgesia*. 1993 Jan; 76(1):156-61.

Abstract: This study documented gastric pH and volume and the number of patients at risk of acid aspiration of gastric contents in a group of mothers undergoing emergency cesarean section under general anesthesia. Patients were randomized in a double-blind fashion to receive ranitidine, 50 mg intravenously, or placebo at the time of decision to proceed to cesarean section. In addition, all patients received 30 mL of 0.3 M sodium citrate on entry into the operating room. Aspiration of gastric contents was undertaken immediately after endotracheal intubation (PI) and before tracheal extubation. Patients with both pH < 3.5 and volume > 25 mL were deemed to be at risk of acid aspiration should regurgitation occur. Postintubation, 12 patients (4%) were at risk in the citrate-alone group and 7 patients (2.3%) were at risk in the ranitidine/citrate group (not significant). Preextubation, 17 patients (5.6%) were at risk in the citrate-alone group and 1 patient (0.3%) was at risk in the ranitidine/citrate group ($P < 0.05$). PI pH in patients receiving ranitidine/citrate (mean 5.2, SD 0.8) was significantly higher than in patients receiving citrate alone (mean 4.9, SD 1.1). None of the patients who received ranitidine more than 30 min before the PI sample were at risk compared to 6 (3.2%) in the citrate alone group ($P = 0.05$). We conclude that 50 mg of intravenous ranitidine given at the time of decision to proceed to cesarean section reduces the risk of acid aspiration provided that at least 30 min have elapsed from injection to induction of anesthesia

48. Norn, M. (Eye Department, Hvidovre Hospital, University of Copenhagen, Denmark). Sampling methods for tear stix tests. *Acta Ophthalmologica*. 1992 Dec; 70(6):754-7.
Abstract: Four different methods for transferring conjunctival fluid to stix test pads were studied. One hundred and twenty eyes from 120 cataract-extracted patients (35 in the operated eye 0-5 days post-operatively and 85 in the contralateral eye) were included in the study. Transfer of fluid by a glass rod from the lateral part of the inferior fornix was demonstrated to be the most suitable method, showing the highest sensitivity to leucocyte-esterase (83%, $N = 120$, $p < 0.05$) and with a specificity equal to that of the other methods tested (cotton, spongostan, Schirmer paper strip). The glass rod method is suitable for detecting blood, nitrite, albumin, pH, and glucose, and is a both quick and unintrusive procedure. All four transferring methods may, however, cause an increased desquamation of epithelial cells and an increased amount of mucus
49. Papadimitriou, L.; Kandiloros, A.; Lakiotis, K., and Vlontzos, M. (Department of Anaesthesiology, Evangelismos hospital, Athens, Greece). Protecting against the acid aspiration syndrome in adult patients undergoing emergency surgery. *Hepato-Gastroenterology*. 1992 Dec; 39(6):560-1.
Abstract: This paper has studied the effect of i.v. cimetidine and ranitidine, given 1 h prior to anesthesia, on gastric volume and pH in three homogeneous groups undergoing emergency surgery. Group I (10 patients) received placebo, group II (20 patients) cimetidine 400 mg in saline solution, and group III (20 patients) ranitidine 150 mg in saline. Standardised premedication was administered and anesthesia induced. Immediately after tracheal intubation the stomach contents were aspirated and analysed for volume and pH. There were no significant differences in gastric volume among the three groups. However, treated patients had significantly elevated pH as compared with the control group and the number of patients at risk (pH < 2.5 and volume > 25 ml) was significantly smaller at 20% and 15%, respectively, than in the control group (40%). It is concluded that cimetidine 400 mg, and ranitidine 150 mg i. v., given about 70 min. prior to induction of anesthesia may decrease the risk of the acid aspiration syndrome in emergency operations
50. Baguet, J.; Claudon-Eyl, V., and Gachon, A. M. (Laboratoire Meuse Optique Contact (MOC), Centre Hospitalier, Bar le Duc, France). Tear protein G originates from denatured tear specific prealbumin as revealed by two-dimensional electrophoresis. *Current Eye Research*. 1992 Nov; 11(11):1057-65.
Abstract: One-dimensional sodium dodecyl sulfate-polyacrylamide gel electrophoresis (1D-SDS PAGE) of the non-denatured low molecular weight (MW) tear proteins (dilution in phosphate buffered saline or in the non-ionic detergent Triton X100) revealed no protein G but a strongly

marked 23-kD related to a tear specific prealbumin (TSP) subunit coming with the known 15, 17, 18 and 20-kD TSP subunits. Under mild denaturing conditions of sample preparation with SDS dilution just before electrophoresis, 23-kD protein decreased and a faint 32-kD protein G appeared. Under stronger denaturing conditions of sample preparation with SDS treatment (boiling or freeze-thaw cycles), 23-kD protein disappeared and two main protein G forms (32 and 34-kD) and additional bands (29, 36, 39, 42, 57 and 60-kD) appeared depending on the sample treatment. The isoelectric pH (pI) of these proteins ranged from pH 5.2 to pH 5.4. Different two-dimensional electrophoresis methods revealed that: - in presence of SDS, 23-kD protein was spontaneously changed into 17-kD TSP and such a phenomenon was partially reversible by using a non-ionic detergent (Triton X100), new proteins appeared under denaturing processes were related to various protein G forms and originated from TSP group, proteins G were produced by the aggregation of TSP subunit related to MW 17-kD/pI 5.0 corresponding to the major TSP subunit, disulfide bond formation was shown to play a major role in the aggregation process although protein G group was not totally reduced by dithiothreitol. Such results suggest that protein G is an in vitro experimental artifact due to denaturing conditions with SDS treatment.(ABSTRACT TRUNCATED AT 250 WORDS)

51. Walgenbach, S. and Junginger, T. (Klinik und Poliklinik für Allgemein- und Abdominalchirurgie, Johannes-Gutenberg-Universität Mainz). [Results of stomach resection with Roux gastrojejunostomy for gastroduodenal ulcers]. [German]. *Chirurg*. 1992 Jun; 63(6):511-5.
Abstract: In a follow-up study operative risk, postoperative functional disorders and incidence of anastomotic (recurrent) ulcer after partial gastrectomy with Roux-en-Y gastrojejunostomy for gastroduodenal ulcer were evaluated in 52 patients. Lethality for elective treatment was 0 and for emergency surgery (ulcer bleeding) 16.7%. 29.5% of the patients reported postoperative functional disorders. Because Roux-en-Y reconstruction prevented duodenogastric reflux, intragastric pH was low (median 2.2) and in the absence of ulcer protective, neutralizing reflux anastomotic ulcer occurred in 15.9% of the patients. With regard to the high rate of recurrent ulcer Roux-en-Y reconstruction after partial gastrectomy for primary ulcer surgery should be avoided and reconstruction procedures preferred, which guarantee duodenogastric reflux

52. Cejkova, J.; Lojda, Z.; Vacik, J.; Digenis, G. A., and Dropcova, S. (Institute of Experimental Medicine, Czechoslovak Academy of Sciences, Praha, CSFR). Histochemical changes in the rabbit cornea and plasmin activity in the tear fluid during contact lens wear. Favourable influence of protease inhibitors (aprotinin, PC5, elastatinal). *Histochemistry*. 1992; 97(1):69-76.
Abstract: Plasmin activity in the tear fluid of the rabbit eye was examined during the wearing of soft contact lenses (SCL) and compared with the occurrence of corneal disturbances assessed in cryostat sections. Plasmin activity was determined with a semiquantitative method using dry punches of filter paper previously soaked in 0.1 M Tris-HCl buffer solution containing mmol/l D-Val-Leu-Lys-FCA (trifluoromethylaminocoumarine), pH 7.2. Punches were applied to the corneal surface for 5 s (tear collection) and incubated in wet chamber. The time of appearance of the bright yellow fluorescence in UV light was recorded and taken as a measure of plasmin activity. For calibration punches soaked in solutions containing plasmin in various concentrations, and processed in the same manner were used. Changes in the cornea were examined histochemically using methods of choice for acid glycosidases, proteases, dehydrogenases, and Na(+)-K(+)-ATPase. SCL with high and low water content were worn in rabbits in 1, 2, 4, 7, 14, 21 and 28 days. Decreased activity of Na(+)-K(+)-ATPase, GGT, and SDH in the corneal endothelium and epithelium were not accompanied by detectable plasmin activity in the tear fluid. Pronounced damage of the corneal epithelium (increased activities of acid glycosidases, acid proteases, LDH, markedly decreased activity of SDH) was accompanied by low concentration of plasmin (0.4-1.0 micrograms/ml) in the tear fluid. Middle activity of plasmin (1.0-2.0 micrograms/ml) was detectable when PMNs were present in the corneal stroma. High plasmin activity (2.0-3.0 micrograms/ml) correlated with corneal ulceration and vascularization.(ABSTRACT TRUNCATED AT 250 WORDS)

53. Gorman, R. L.; Khin-Maung-Gyi, M. T.; Klein-Schwartz, W.; Oderda, G. M.; Benson, B.; Litovitz, T.; McCormick, M.; McElwee, N.; Spiller, H., and Krenzelok, E. (Maryland Poison Center, Baltimore 21201). Initial symptoms as predictors of esophageal injury in alkaline corrosive ingestions. *American Journal of Emergency Medicine*. 1992 May; 10(3):189-94.
Abstract: The predictive value of initial clinical evaluation in the management of alkaline corrosive ingestion remains unclear. This multicenter study was designed to determine if specific clinical signs and symptoms following ingestion of alkaline corrosives could predict significant esophageal injury. Alkaline corrosives were defined by a pH greater than or equal to 12. Signs and symptoms previously suggested as predictive of significant esophageal injury were documented on a standardized data form. Esophagoscopy reports were reviewed blinded to initial symptoms. Three hundred thirty-six alkaline-corrosive ingestions were analyzed. The mean number of symptoms reported in patients who did not have esophagoscopy was 1.2, in patients who had esophagoscopy was 3.0, and in patients that had visualized second or third degree esophageal burns was 4.8. Of 88 patients who had esophagoscopy, 63 (72%) had both the esophagoscopy report and initial symptom assessment available. Esophagoscopy was positive, defined as second or third degree esophageal burns, in 18 of 63 cases (29%). All patients with significant burns were symptomatic. No single or group of initially reported signs and symptoms could identify all patients with potentially serious esophageal burns
54. Winemaker, M.; Douglas, L., and Peters, W. (Ross Tilley Burn Centre, Wellesley Hospital, Toronto, Canada). Combination alkali/thermal burns caused by 'black liquor' in the pulp and paper industry. *Burns*. 1992 Feb; 18(1):68-70.
Abstract: Three patients are presented, who sustained a unique type of burn injury while working in the pulp and paper industry in Canada. These patients suffered combination chemical (pH 11-13) and thermal (85-95 degrees C) injuries, when they were exposed to 'black liquor'--a solution which is used in the pulp and paper industry to convert wood chips to pulp. Black liquor can rapidly cause devastating thermal-corrosive burns to the skin, eyes, lungs, and upper gastrointestinal tract. One patient sustained a relatively minor, full skin thickness 3 per cent body surface area (BSA) injury to both feet and lower legs. The second patient, who was sprayed with the heated black liquor solution, sustained a full skin thickness injury to 40 per cent BSA and also suffered virtual loss of vision in one eye. The third patient, who was also sprayed with the solution, sustained a 98 per cent full skin thickness burn and severe inhalation injury, and died during day 1 postburn. Photographic documentation of all three patients is presented. The principles of treatment of this type of burn injury are reviewed. All of these burns were preventable
55. Lim, S. K. and Elegbe, E. O. (Department of Anaesthesiology, Faculty of Medicine, Universiti Kebangsaan Malaysia, Jalan Raja Muda, Kuala Lumpur). The use of single dose of sodium citrate as a prophylaxis against acid aspiration syndrome in obstetric patients undergoing caesarean section. *Medical Journal of Malaysia*. 1991 Dec; 46(4):349-55.
Abstract: The effectiveness of sodium citrate as a prophylaxis against acid aspiration syndrome was studied in 3 groups of obstetric patients. Group I was the control group which consisted of 20 patients in established labour who were not likely to require caesarean section. No antacid had been given to these patients. Group II consisted of 20 patients who underwent elective caesarean section, while Group III consisted of another 20 patients who underwent emergency caesarean section. Group II and III were given 30ml of 0.3M sodium citrate as soon as they arrived in the operation theatre. The gastric content was aspirated after the induction of anaesthesia and at the end of surgery just before extubation. The volume was measured and a sample sent for pH analysis. Sodium citrate was found to increase the gastric pH significantly in both Group II and III patients when compared with Group I patients who underwent emergency caesarean section. We conclude that 30ml of 0.3M sodium citrate is effective in increasing gastric pH though it tends to be associated with an increase in gastric volume

56. Yildirim, N.; Topbas, S.; Usluer, G.; Ozgunes, I.; Basmak, H., and Yurdakul, S. (Anadolu Universitesi, Tip Fakultesi, Goz Hastaliklari Anabilim Dalı Ogretim Uyesi). [Stability of cefazolin sodium as eyedrops in various solutions]. [Turkish]. Mikrobiyoloji Bulteni. 1991 Jul; 25(3):272-6.
Abstract: Cephazolin sodium prepared with four different solutions (NaCl 0.9%, Protagent, Liquifilm and phosphate buffer) to be used as eye drops, was evaluated as to its physicochemical features at +4 degrees C, +37 degrees C and at room temperature and its activity in terms of minimal inhibition concentration. In conclusion, cephazolin sodium prepared with artificial tears at acidic pH can be kept for 3 days at room temperature and at +4 degrees C without any loss of its activity
57. Janda, A. M. (Hennepin County Medical Center, Department of Ophthalmology, Minneapolis, MN 55415). Ocular trauma. Triage and treatment. Postgraduate Medicine. 1955 Nov 15-1960 Nov 15; 90(7):51-2.
Abstract: Many types of ocular trauma can be diagnosed and treated in the primary care office, particularly if a slit lamp is available. Treatment for corneal abrasions consists of applying a cycloplegic medication, antibiotic ointment, and a patch (unless a corneal ulcer is suspected). Iritis can be treated with cycloplegics and topical corticosteroids; the prescribing physician should be familiar with the potential ocular side effects and complications. Hyphemas are treated with bed rest, topical atropine sulfate drops and topical corticosteroids, as well as measures to prevent rebleeding. A slit lamp, topical anesthesia, and a foreign-body spud greatly facilitate the removal of foreign bodies from the cornea. Acid and alkali burns should be irrigated until the pH is normal and then should be treated like a corneal abrasion. Lid lacerations must be repaired with care to preserve proper functioning of the lid. Ruptures of the globe are serious injuries requiring surgical repair and long-term follow-up
58. Adamek, H. E.; Weber, J.; Benz, C., and Riemann, J. F. (Medizinische Klinik, Klinikum der Stadt Ludwigshafen). [Lye corrosion of the esophagus. Course under long-term bougienage]. [German]. Deutsche Medizinische Wochenschrift. 1991 Nov 2; 116(44):1664-9.
Abstract: In an alcoholic state a 61-year-old woman swallowed by mistake about 125 ml of a lye-containing glass-washing liquid (pH 12). About 30 min later she repeatedly brought up blood-containing vomitus and was admitted to hospital. Extensive corrosive damage in the oesophagus and entire stomach developed within a few days. Two weeks later a circular narrowing of the oesophageal lumen, which could not be passed endoscopically, was seen. Afterwards she repeatedly underwent endoscopic bougie dilatation. At the third dilatation the oesophagus was perforated, mediastinitis occurred but responded without further problems to conservative medical treatment. Two months after the initial injury a Billroth II gastric resection was performed because of complete stenosis of the gastric exit. Bougie dilatation was continued at widening intervals for 18 months after the ingestion. Subsequently the patient has remained without symptoms, although a secondary Barrett oesophagus has developed at the oesophago-gastric junction which, because of the potential danger of malignant degeneration, will require regular follow-up
59. Howell, J. M. (North East Ohio Universities College of Medicine, Akron, OH). Alkalinity of non-industrial cleaning products and the likelihood of producing significant esophageal burns. American Journal of Emergency Medicine. 1991 Nov; 9(6):560-2.
Abstract: Alkaline cleaning products are a cause of serious esophageal injury. Over time, legislation has diminished the concentration of many such non-industrial solutions and solids; however several products presently do not list either the pH or relative concentrations of alkaline constituents. This study measures the pHs of several non-industrial cleaning products containing either ammonium chloride, sodium hydroxide, or potassium hydroxide. Three pH measurements were performed on each of 10 non-industrial alkaline cleaning products (eight liquid, two solid). Two 0.1% ammonium chloride solutions had pHs of 12.06 +/- 0.00 and 12.06 +/- 0.01, whereas a pH of 12.43 +/- 0.00 was recorded in a 0.2% ammonium chloride solution. Concentrations of sodium hydroxide and potassium hydroxide were listed on only one of five liquid cleaning product labels. The pHs for these five products varied between 12.83 +/- 0.009 and 13.5 +/- .0.2. The pHs of three sodium hydroxide solutions

differed from values reported in Micromedex (Micromedex Inc, Denver CO) by up to 0.32 pH units. Ten percent (v/v) solutions of two solid lye products had pHs of 13.62 +/- 0.008 and 13.74 +/- 0.02. The investigator found that selected non-industrial cleaning products, including ammonia solutions, retain the ability to cause clinically important esophageal damage

60. Hugh, T. B.; Meagher, A. P., and Li, B. (Department of Surgery, St. Vincent's Hospital, Sydney, Australia). Gastric antral patch esophagoplasty for extensive corrosive stricture of the esophagus. *World Journal of Surgery*. 303 Mar-303 Apr 30; 15(2):299-303.
Abstract: A case is reported of a patient with a 9-cm stricture of the esophagus caused by ingestion of sodium hydroxide, who was treated by gastric antral patch esophagoplasty. In this procedure, a full-thickness pedicled patch of gastric antrum, based on the left gastroepiploic artery, was used to enlarge the esophageal lumen, thus allowing preservation of esophageal continuity and utilization of a functioning lower esophageal sphincter. The patient ate normally after the operation, and radiological, manometric, and esophageal pH monitoring studies indicated satisfactory esophageal function. Gastric antral patch esophagoplasty avoids the complications associated with esophageal bypass or resection. Previous long-term results of this procedure in patients with reflux-induced esophageal stricture have been good, and the technique merits consideration in the treatment of severe corrosive strictures

61. Khurana, A. K.; Chaudhary, R.; Ahluwalia, B. K., and Gupta, S. (Department of Ophthalmology-II, Medical College, Rohtak (Haryana), India). Tear film profile in dry eye. *Acta Ophthalmologica*. 1991 Feb; 69(1):79-86.
Abstract: Tear film profile was studied in 100 consecutive patients with dry eye along with 100 age and sex matched controls. The frequency of abnormal tear function tests observed in patients with dry eye and controls was: marginal tear strip 93% and 11%, rose bengal staining 89% and 0%, lissamine green staining 87% and 0%, BUT 79% and 14%, Schirmer test 79% and 3% and fluorescein staining 69% and 0%, respectively. No significant difference was observed between tear pH of patients with dry eye and that of normal healthy subjects. A new, simple and effective objective criteria of confirming and grading dry eye based upon a points scoring system derived from the results of various tear film tests is suggested

62. Herr, R. D.; White, G. L. Jr; Bernhisel, K.; Mamalis, N., and Swanson, E. (Department of Surgery, University of Utah Medical School, Salt Lake City). Clinical comparison of ocular irrigation fluids following chemical injury. *American Journal of Emergency Medicine*. 1991 May; 9(3):228-31.
Abstract: This study tested the hypothesis that four ocular irrigating solutions were equally irritating during copious irrigation. We conducted a prospective, double-blind study of patients with chemical exposure to the eye. Each underwent cross-over irrigation with all of the following in random order: normal saline (NS), lactated Ringer's (LR), normal saline adjusted to pH 7.4 with sodium bicarbonate (NS + Bicarb), and Balanced Saline Solution Plus (BSS Plus, Alcon Laboratories, Fort Worth, TX). Compared with traditional NS and LR, NS + Bicarb tended to be more comfortable. BSS Plus was statistically superior (P less than .05) to NS and preferred over LR and NS + Bicarb. Three patients demanded discontinuance of NS or NS + Bicarb infusions. All solutions had comparable normalization of conjunctival pH and degree of injection. Alternate solutions including BSS Plus should be considered for use in those patients whose poor tolerance to normal saline threatens to delay or interrupt eye irrigation following a chemical injury

63. McCulley, J. P. (Southwestern Medical Center, Dallas, Texas). Ocular hydrofluoric acid burns: animal model, mechanism of injury and therapy. *Transactions of the American Ophthalmological Society*. 88:649-84, 1990.
Abstract: A series of ocular HF burns was produced in rabbits in order to clarify the nature of the injury and to provide a description of the animal

model. Burned eyes were evaluated clinically and allowed to progress for up to 65 days before histologic examination. The mechanism of HF toxicity was investigated through the study of burns produced by chemicals chosen to mimic its pH effects, osmotic effects, and effects of the free fluoride ion alone. The severe progressive caustic effect of HF on the eyes was found to depend on the combination of pH and the toxic effects of the free fluoride ion, together causing extensive dose-related damage to superficial and deep structures of the eye. Mild burns caused reversible ocular injury; whereas more severe burns lead to corneal stromal scarring, vascularization, edema, formation of calcific band keratopathy plus iris and ciliary body fibrosis. An investigation was made of potential treatments for experimental ocular HF burns in rabbits. Topical ointments containing MgO or MgSO₄ and irrigations with or subconjunctival injections of H₂O or solutions containing NaCl, MgCl₂, CaCl₂, LaCl₃, hyamine, zephiran, calcium gluconate or a mixture of divalent metal ions were tested for toxicity and for therapeutic value in ocular HF burns. Immediate single irrigation with H₂O, NaCl or MgCl₂ solution was most effective. Other therapeutic agents commonly used in HF skin burn therapy were either too toxic in normal eyes or caused additive damage to burned eyes

64. Rieger, G. (Ophthalmic Department of the Paracelsus Institute, Bad Hall, Austria). Lipid-containing eye drops: a step closer to natural tears.[comment]. *Ophthalmologica*. 1990; 201(4):206-12.
Abstract: Disturbances of the lipid composition can, like mucin or fluid deficiency, cause 'dry eye'. The substitution of the lipids of the tear fluid has previously been unsatisfactory since eye ointments containing fats can lead to a considerable deterioration of the visual acuity due to the film of ointment resulting from an irregular spreading behavior. We proposed the introduction of physiological lipids that are normally present in tear fluid, such as phospholipids, saturated and unsaturated fatty acids and triglycerides, to provide lipid-containing eye drops. These best correspond to 'natural tears' and, due to the small size of the lipid particles, avoid a disturbance of the spreading behavior of the lipid layer. With lipid-containing eye drops of this kind, we carried out the following examinations: inquiry of patients' symptoms based on a standardized interview; Schirmer test under local anesthesia; break-up time (BUT); biomicroscopic evaluation of the lipid film, and stability tests as pH, gas chromatographic analysis of the fatty acid pattern and thin-layer chromatographic analysis of the lipid pattern. Schirmer test, BUT measurement and questioning about symptoms were undertaken after 1 week and then again after 3 weeks of treatment. All three parameters finally showed an improvement with a high statistical significance (p less than 0.001). The stability tests have shown that pH, lipid particle size, fatty acid and lipid composition of the examined lipid-containing eye drops were nearly unchanged till 4 months after preparation
65. Ormezzano, X.; Ganansia, M. F.; Arnould, J. F.; Gregoire, F. M.; Wessel, P. E.; Bourgeonneau, M. C.; Bukowski, J. C.; Grinand, M. R.; Viaud, J. Y., and N'Guyen, N. Q. (Service d'Anesthesiologie, Centres Hospitaliers Generaux de Saint-Nazaire, Nantes). [Prevention of aspiration pneumonia in obstetrical anesthesia with the effervescent combination of cimetidine and sodium citrate]. [French]. *Annales Francaises d Anesthesie Et De Reanimation*. 1990; 9(3):285-8.
Abstract: The effect of an oral effervescent formulation combining 200 mg cimetidine and 1.8 g sodium citrate on gastric pH and volume were studied in patients undergoing caesarean section. Seventy-four patients undergoing elective (group 1) or emergency caesarean section (group 2) were included. Before entering the operating theater (5 to 60 min before intubation), they were given the tablet dissolved in 15 ml of water. Induction and maintenance of anaesthesia were carried out with conventional techniques. The patient's gastric content was aspirated just after endotracheal intubation, and before extubation. its pH and volume were measured at both times. Mean pH was similar in the two groups after intubation (6.07 +/- 1.13 in group 1; 5.52 +/- 1.14 in group 2) and before extubation (6.32 +/- 1.08 vs. 5.85 +/- 1.02 respectively). Gastric pH was therefore greater than 2.5 in all 74 patients at both times. Mean volumes of gastric content after intubation were greater in group 2 (32.7 +/- 23.9 ml vs. 21.6 +/- 15.8 ml; p less than 0.02). However, just before extubation, these were similar (15.0 +/- 15.4 ml in group 1, 20.1 +/- 14.9 ml in

group 2). The percentage of patients in the 2 groups with gastric volumes greater than 25 ml at the time of intubation were not significantly different (29.7% vs. 45.9% respectively). No patient was at risk of developing pneumonitis in case of aspiration (gastric content pH less than 2.5 and volume greater than 25 ml), either during endotracheal intubation or extubation.(ABSTRACT TRUNCATED AT 250 WORDS)

66. Ormezzano, X.; Francois, T. P.; Viaud, J. Y.; Bukowski, J. G.; Bourgonneau, M. C.; Cottron, D.; Ganansia, M. F.; Gregoire, F. M.; Grinand, M. R., and Wessel, P. E. (Departement d'Anesthesie, Centre Hospitalier de Saint Nazaire, France). Aspiration pneumonitis prophylaxis in obstetric anaesthesia: comparison of effervescent cimetidine-sodium citrate mixture and sodium citrate. *BJA: British Journal of Anaesthesia*. 1990 Apr; 64(4):503-6.
Abstract: One hundred and forty-seven patients undergoing elective or emergency Caesarean section under general anaesthesia were allocated randomly to three groups: group 1 (n = 28) received no premedication; group 2 (n = 58) received 0.3-molar sodium citrate 15 ml (sodium citrate 1.16 g); group 3 (n = 61) received effervescent cimetidine-sodium citrate combination (cimetidine 400 mg with sodium citrate 0.9 g) after entering the operating room. Gastric pH was measured at tracheal intubation (pH1) and extubation (pH2). Mean pH1 and mean pH2 values in group 1 were, respectively, 2.25 (SD 1.35) and 2.83 (1.64). Mean pH1 and pH2 values in group 2 were, respectively, 4.38 (1.44) and 4.57 (1.51). In group 3 mean pH1 and pH2 values were, respectively, 5.07 (1.13) and 5.37 (1.30). Percentages of patients with pH1 less than or equal to 2.5 in groups 1, 2 and 3 were, respectively, 75, 13.8 and 1.6. Percentages of patients with pH2 less than or equal to 2.5 in groups 1, 2 and 3 were 50, 10.3 and 1.6, respectively
67. Chen, F. S. and Maurice, D. M. (Department of Ophthalmology, Stanford University Medical Center, CA 94305). The pH in the precorneal tear film and under a contact lens measured with a fluorescent probe. *Experimental Eye Research*. 1990 Mar; 50(3):251-9.
Abstract: The reaction of the precorneal tear film of the human eye was determined non-invasively by instilling pyranine, a pH-sensitive fluorescent dye. The mean value was 7.83 (S.D. +/- 0.10) and it takes up this value immediately on opening the eye after the lids had been kept closed. The HCO₃ system seems to be responsible for only a portion of the buffering power of the tear film. When a drop buffered to pH 6.4 with 0.075 M PO₄ was instilled, the tears returned to their normal value in about 7 min, consistent with the washout times of solutes in the conjunctival sac. A pH of 7.3 was established in the tear fluid behind contact lenses either gas permeable or impermeable, probably as a result of their restricting the loss of CO₂ from the eye
68. Gallagher, E. J.; Schwartz, E., and Weinstein, R. S. (Emergency Medical Services, Bronx Municipal Hospital Center, NY 10461). Performance characteristics of urine dipsticks stored in open containers. *American Journal of Emergency Medicine*. 1990 Mar; 8(2):121-3.
Abstract: Dip and read urinalysis is a laboratory test commonly performed by emergency physicians. Although the manufacturer states that the capped vials containing the dipsticks must be closed immediately after removal of a strip, this recommendation may not be followed in a busy emergency department. In a simple, two-part, blinded, and controlled trial the authors found that the reagents for determining leukocyte esterase, pH, protein, glucose, ketones, urobilinogen, bilirubin, and blood showed good reproducibility when fresh dipsticks were compared with dipsticks exposed to room temperature and humidity for 1 to 15 days. In contrast to this, the nitrite portion of the exposed dipsticks showed a rapid and cumulative loss of specificity over time. By the end of a week of exposure, one third of the nitrite tests gave false-positive readings. At the end of a second week, nearly three quarters gave false-positive readings for a specificity of only 28%. It is concluded that the nitrite reagent, in contrast to the other eight reagents on the Chemstrip-9 dipstick (Biodynamics, Indianapolis, IN), rapidly loses accuracy when stored in uncapped vials

69. Sheppard, J. D.; Orenstein, D. M.; Chao, C. C.; Butala, S., and Kowalski, R. P. (Department of Ophthalmology, University of Pittsburgh School of Medicine, Children's Hospital of Pittsburgh). The ocular surface in cystic fibrosis. *Ophthalmology*. 1989 Nov; 96(11):1624-30.
Abstract: Seventeen patients with cystic fibrosis and 17 age-, race-, and sex-matched controls were examined under standardized conditions. Testing included slit-lamp biomicroscopy, fluorescein staining, rose bengal staining, Schirmer's basic tear test, tear film break-up time, tear pH, tear lysozyme, tear protein, lid and conjunctival cultures, and conjunctival impression cytology. Cystic fibrosis patients showed a statistically significant increase in the incidence of fluorescein staining and clinical blepharitis, as well as significantly decreased Schirmer testing and tear lysozyme. Ocular surface abnormalities in these patients may be attributable to aqueous and lipid tear film deficiencies. Cystic fibrosis patients showed normal conjunctival epithelial cell morphology, grew no pathogenic organisms, and had a decreased incidence of conjunctival bacterial colonization

70. Hoffman, R. S.; Howland, M. A.; Kamerow, H. N., and Goldfrank, L. R. (New York City Poison Control Center, N.Y. 10016). Comparison of titratable acid/alkaline reserve and pH in potentially caustic household products. *Journal of Toxicology - Clinical Toxicology*. 1989; 27(4-5):241-6.
Abstract: Exposure to caustic agents is a common problem, affecting thousands of individuals annually. Despite this incidence, the factors responsible for the production of injury remain poorly defined. Although extremes of pH seem to correlate well with the production of esophageal lesions, pH alone fails to explain the damage resulting from exposure to agents with near neutral pH, such as soldering flux containing zinc chloride. We determined titratable acid/alkaline reserve (TAR) in 38 potentially caustic household agents. A subset of these products was evaluated in an in-vitro canine esophageal model to determine whether TAR correlated with esophageal injury. The results indicate that for the products evaluated TAR correlated better than pH with the production of caustic esophageal injury

71. Usui, Y.; Matsukawa, M.; Hamada, T.; Watanabe, H.; Kondo, K.; Kitamura, S.; Kuwabara, N., and Shirakabe, H. (Department of Gastroenterology, Juntendo University School of Medicine, Tokyo, Japan). Corrosive gastritis mimicking linitis plastica carcinoma. *Gastroenterologia Japonica*. 1989 Aug; 24(4):398-401.
Abstract: A 59-year-old female with depressive tendencies was admitted suffering from hematemesis and abdominal pain, two hours after ingestion of an unknown amount of toilet bowl cleaner (hydrochloric acid, pH 1.0). A barium study 24 days after ingestion revealed rigid narrowing and granulation of the entire stomach. The esophagus and duodenum were normal. The radiographic results were similar to those obtained for linitis plastica carcinoma of the stomach, but biopsy specimens of the stomach revealed no cancer cells. A total gastrectomy was performed about two months after ingestion to relieve the persistent feeling of nausea. Specimens revealed a rigid and thickening lining and a denuded mucosal surface of the stomach. The cut surface of the specimen showed a remarkable fibrous thickening of the submucosal layer. Microscopic examination failed to reveal a normal mucosal layer except in a narrow area of the fornix, and remarkable fibrosis of the submucosal lining was noted. No cancer cells were found. Corrosive gastritis has a linitis plastica appearance with a predilection for the antrum. Radiological examination revealed the very rare manifestation of a rigid narrowing of the whole stomach mimicking linitis plastica type cancer

72. Burns, F. R. and Paterson, C. A. (Kentucky Lions Eye Research Institute, University of Louisville). Prompt irrigation of chemical eye injuries may avert severe damage. *Occupational Health & Safety*. 1989 Apr; 58(4):33-6.
Abstract: Chemical burns to the eye are among the most urgent of ocular emergencies. The clinical outcome of the injury is directly related to the expediency with which treatment is begun. Copious irrigation is the most important emergency treatment of the chemically-burned eye. This irrigation should begin immediately at the scene of the accident with any non-toxic liquid. Removal of any particulate matter must be done to

prevent further ocular damage. The subsequent therapy is directed at the treatment of secondary sequelae and at preserving the globe to surgically rehabilitate the eye. Many of the treatments which are used in the intermediate and late phases of the injury are used to prevent corneal ulceration and perforation. These are the most difficult sequelae to threat in alkali injuries; thus, preventing the progression to this stage is of the utmost importance. Again the immediate and continuous irrigation of the eye may help accomplish this goal. The availability of emergency eye-wash equipment dispensing a safe, preserved, pH-balanced, physiologically correct solution in the industrial, agricultural and even the home setting is a necessity. The education of employees and family members in the proper technique of irrigating the eye following a chemical burn is also of extreme importance. Immediate irrigation of the eye, continued during rapid transport to a medical care facility, minimizes the damage to the eye and enhances the eventual clinical outcome

73. Manevich, V. L.; Kharitonov, L. G., and Sonts, G. M. [Functional status of the operated-on stomach in patients with post-burn esophageal stenosis]. [Russian]. *Khirurgiia*. 1989 Mar; (3):79-83.
Abstract: The article discusses the results of complex functional examination of the stomach in 41 patients with post-burn stenosis of the esophagus in different postoperative periods. Group I consisted of 21 patients with isolated chemical burns of the esophagus, group II was made up of 20 patients with combined chemical burns of the esophagus and stomach. Special new methods of examination (3-canal and endoscopic pH-metry, balloonography, radioisotope gastroscintigraphy, radioimmunological test for the hormone gastrin) were conducted to study the functional condition of the stomach which had been operated on. Objective evaluation is possible only by complex use of special methods of examination
74. Kuster, M.; Naji, P.; Gabi, K., and Kreienbuhl, G. (Institut für Anaesthesie und Intensivmedizin, Kantonsspital St. Gallen). [Intraoperative, direct and continuous measurement of stomach pH following pretreatment with ranitidine or sodium citrate]. [German]. *Anaesthesist*. 1989 Feb; 38(2):59-64.
Abstract: We carried out continuous direct pH measurements of gastric fluid in 49 female patients pretreated with 300 mg ranitidine by mouth on the evening prior to surgery and 150 mg by mouth before the operation. A further 51 women were pretreated with 30 ml sodium citrate shortly before admission to the operating room. Twenty patients received 30 ml sodium citrate via a separate gastric tube after the first pH measurement; 22 were given no premedication. In 95% of cases, 30 ml sodium citrate was found to increase the pH to over 3.5 within 5 min; a failure rate of 5% can therefore be expected. This can be explained mainly by the failure of sodium citrate to mix thoroughly with the gastric fluid. Pretreatment with ranitidine increased the pH to over 4.0 in every case, and the pH on extubation was still over 4.0 even after delayed pH on extubation was still over 4.0 even after delayed or prolonged operations. We recommend that 30 ml sodium citrate be given shortly before the beginning of emergency obstetric operations. However, we prefer ranitidine for elective operations in patients at risk for aspiration because it increases of the gastric fluid pH to at least 4.0 in every case
75. Fassihi, A. R. and Naidoo, N. T. (Department of Pharmacy, University of the Witwatersrand, Johannesburg). Irritation associated with tear-replacement ophthalmic drops. A pharmaceutical and subjective investigation. *South African Medical Journal*. 1989 Mar 4; 75(5):233-5.
Abstract: Artificial tears, commonly prescribed for correction of the dry-eye syndrome, are formulated with suitably preserved aqueous polymeric solutions to promote corneal wetting without causing such side-effects as burning, itching, blurred vision and scratchiness. Four of the most commonly used commercial tear-replacement solutions were investigated after complaints of irritation by some users. The solutions were tested for tonicity, viscosity and pH and found to be in the tolerable range (tonicity equivalent to 0.5-1.5% m/v sodium chloride, viscosity 1-15

centipoise and pH 4-9). A double-blind cross-over study was conducted on 16 subjects and the degree of discomfort (non-irritant, irritant, and highly irritant) was determined subjectively. Results indicated that 3 of the tear solutions were acceptable. However, over 50% of the subjects reported irritation from the solution comprising polyvinyl alcohol 1.4% m/v preserved with 0.5% m/v chlorobutanol. To identify the cause of irritation, two extemporaneously prepared controls containing polyvinyl alcohol 1.4% m/v, with and without chlorobutanol 0.5% m/v as preservative, were also included in the study. The irritant response was found to be caused by the presence of chlorobutanol in the formulation. An attempt is made to identify and explain formulation properties likely to elicit adverse responses

76. Bikfalvi, A.; Dupuy, E.; Inyang, A. L.; Fayein, N.; Leseche, G.; Courtois, Y., and Tobelem, G. (INSERM U 150, Hopital Lariboisiere, Paris, France). Binding, internalization, and degradation of basic fibroblast growth factor in human microvascular endothelial cells. *Experimental Cell Research*. 1989 Mar; 181(1):75-84.
Abstract: The binding, internalization, and degradation of basic fibroblast growth factor (bFGF) in human omental microvascular endothelial cells (HOME cells) were investigated. Binding studies of bFGF in human endothelial cells have not yet been reported. Basic FGF bound to HOME cells (KD of 42.0 +/- 3.8 pM and 70,526 +/- 6121 binding sites/cell for the high-affinity sites, KD of 0.933 +/- 0.27 nM and 630,252 +/- 172,459 sites/cell for low-affinity binding sites). The number of low-affinity binding sites was found to be variable. Washing the cells with 2 M phosphate-buffered saline removed completely 125I-bFGF bound to low-affinity binding sites but decreased also the high-affinity binding. The majority of the surface-bound 125I-bFGF was removed by washing the cells with acetic acid buffer at pH 3. At 37 degrees C, 30% of the cell-associated 125I-bFGF became resistant to the acidic wash after 90 min, suggesting that this fraction of bound 125I-bFGF was internalized. At this temperature, degradation of the internalized ligand was followed after 1 h by the appearance of three major bands of 15,000, 10,000, and 8,000 Da and was inhibited by chloroquine. These results demonstrated two classes of binding sites for bFGF in HOME cells; the number of high-affinity binding sites being larger than the number reported for bovine capillary endothelial cells. The intracellular processing of bFGF in HOME cells seems to be different from that of heparin binding growth factor-1 in murine lung capillary endothelial cells and of eye-derived growth factor-1 in Chinese hamster fibroblasts
77. Norn, M. S. (Eye Department, Hvidovre Hospital, University of Copenhagen, Denmark). Tear fluid pH in normals, contact lens wearers, and pathological cases. *Acta Ophthalmologica*. 1988 Oct; 66(5):485-9.
Abstract: The pH of the conjunctival fluid was measured with a micro-glass-electrode in the inferior conjunctival fornix of 200 persons. Among 41 binocularly normal persons the pH was found to be 6.93 +/- 0.24 (mean +/- SD) of the primarily examined eye, independent of sex and age. The conjunctival fluid was significantly more acid in contact lens wearers (6.66 +/- 0.28, N = 26), but became normalized after removal of the lens (6.49 +/- 0.32----7.09 +/- 0.19, N = 8, P less than 0.001). The conjunctival fluid was significantly more alkaline in patients with lacrimal stenosis (7.13 +/- 0.28, N = 11), keratitis (7.14 +/- 0.28, N = 10), especially mycotic keratitis and postoperatively (7.15 +/- 0.22, N = 10, the first 24 h after corneal transplantation). There was, perhaps, a tendency towards alkalinisation in eyes with keratoconjunctivitis sicca, whereas the pH was normal in the other pathological states, or the number of cases representing these may be too small
78. Colman, R. D.; Frank, M.; Loughnan, B. A.; Cohen, D. G., and Cattermole, R. (Department of Anaesthetics, Westmead Hospital, Sydney, Australia). Use of i.m. ranitidine for the prophylaxis of aspiration pneumonitis in obstetrics. *BJA: British Journal of Anaesthesia*. 1988 Dec; 61(6):720-9.
Abstract: Twenty patients who underwent elective Caesarean section received ranitidine 150 mg by mouth 8-14 h, and 50 mg i.m. 90 min, before surgery. Intraoperative gastric aspiration resulted in contents with a pH greater than 2.5 and volume less than 25 ml in all patients (mean pH 6.5

(SD 0.8); mean volume 9.0 (SD 7.2) ml). Sixty patients in labour, who received ranitidine 50 mg i.m. 6-hourly, underwent emergency surgery. Half of this group received, in addition, a single preinduction dose of either 15 or 30 ml of sodium citrate 0.3 mol litre⁻¹. A further 30 patients who remained unmedicated during labour and required emergency surgery received a preinduction dose of 15 or 30 ml of sodium citrate 0.3 mol litre⁻¹ alone. Ranitidine medication resulted in a mean aspirated gastric volume of 31.4 (26.6) ml and pH of 5.3 (2.1); five of 30 patients had a pH less than 2.5. The addition of sodium citrate 0.3 mol litre⁻¹ resulted in gastric pH greater than 2.5 in all patients and a mean gastric volume of 43.2 (38.3) ml. The group who received only sodium citrate 0.3 mol litre⁻¹ had a mean pH of 5.3 (1.1) and a mean volume 122.7 (98.2) ml

79. Kovanev, A. V.; Sinev, I. u. V.; Novosel'tseva, S. A.; Mironov, A. V., and Il'iashenko, K. K. [Use of the endoscopic pH-metry method in patients with chemical burns of the esophagus]. [Russian]. *Grudnaia Khirurgiia*. 1988 Jul-1988 Aug 31; (4):71-5.
80. Pike, J.; Patterson, A. Jr, and Arons, M. S. (Plastic Surgery Services, Yale-New Haven Hospital, Connecticut). Chemistry of cement burns: pathogenesis and treatment. *Journal of Burn Care & Rehabilitation*. 1988 May-1988 Jun 30; 9(3):258-60.
Abstract: Two brief cases are presented describing burns resulting from exposure to cement and its components. Of particular interest is the etiology of such burns. Do they result from a high pH solution in contact with the skin under abrasive conditions for an undetermined period of time, or are they a consequence of possible allergic reactions to chromium or chromates? Another possible factor that has been largely unexplored is the role of the calcium ion--the other principal ionic species with which the skin is in contact. Much has been written about its role in membrane transport and other physiologic processes
81. Lorette, J. J. Jr and Wilkinson, J. A. (Department of Emergency Medicine, Tripler Army Medical Center, Honolulu, Hawaii 96859). Alkaline chemical burn to the face requiring full-thickness skin grafting. [comment]. *Annals of Emergency Medicine*. 1988 Jul; 17(7):739-41.
Abstract: A case of a patient with an alkaline chemical burn to the face from the misuse of the aerosol form of an oven cleaner is presented. The low concentration of sodium hydroxide and lack of early pain delayed the patient's presentation to the emergency department for two hours. After this delay in seeking treatment, continuous irrigation in the ED did little to modify the pH of the patient's injured skin. Thus, she developed a full-thickness alkaline burn that eventually required skin grafting
82. Bonanno, J. A. and Polse, K. A. Corneal acidosis during contact lens wear: effects of hypoxia and CO₂. *Investigative Ophthalmology & Visual Science*. 1987 Sep; 28(9):1514-20.
Abstract: The effects of tear-film hypoxia and contact lens wear on human in vivo stromal pH was tested using a non-invasive fluorometric technique. Hypoxia was produced by exposing the normal open eye to 100% nitrogen gas passed through tight-fitting goggles. Stromal pH dropped from 7.53 +/- 0.02 to 7.34 +/- 0.03 (n = 12, +/- SD) within 90 min of nitrogen gas exposure, t_{1/2} = 20 min. After removing the goggles, stromal pH returned to baseline in 35 min, t_{1/2} = 10 min. Wearing a thick hydrogel contact lens which caused a tear PO₂ less than or equal to 2 mm Hg with the eyes open, reduced stromal pH from 7.55 +/- 0.02 to 7.15 +/- 0.04 (n = 12, +/- SD) in 80 min, t_{1/2} = 9.5 min. After removing the lens, baseline pH was reached in 40 min, t_{1/2} = 4.5 min. The stromal pH differences between hypoxia (N₂ only) and contact lens wear were not due to differences in tear temperature between the two procedures (contact lens wear 32 +/- 1.5 degrees C, goggles 33 +/- 1.0 degrees C). However exposing the eye to 95% nitrogen-5% carbon dioxide reduced stromal pH to 7.16 +/- 0.05 (n = 7, +/- SD) in 80 min, t_{1/2} = 8 min, which was similar to that produced during contact lens wear. These experiments show that contact lens wear causes corneal acidosis by: (1) the production of protons from hypoxic metabolism, and (2) the accumulation of carbon dioxide behind the lens due to low lens CO₂ transmissibility

83. Thygesen, J. E. and Jensen, O. L. pH changes of the tear fluid in the conjunctival sac during postoperative inflammation of the human eye. *Acta Ophthalmologica*. 1987 Apr; 65(2):134-6.
Abstract: Conjunctival fluid pH was measured pre- and post-operatively in 16 patients suffering from senile cataract. We found a significant increase (P less than 0.05) from 7.26 +/- 0.23 (mean +/- SD) on the day before operation to 7.50 +/- 0.23 (mean +/- SD) on the first post-operative day in the conjunctival fluid of the treated eye. Thereafter a gradual decrease towards pre-operative level was observed. These changes were not observed in the healthy fellow eye (P greater than 0.05). No significant pre-operative difference was shown between the two eyes. It is reasonable to assume that the composition of the transudate/exudate from the conjunctival vessels might be responsible for the changes observed
84. Coyle, P. K.; Sibony, P., and Johnson, C. Oligoclonal IgG in tears. *Neurology*. 1987 May; 37(5):853-6.
Abstract: We examined tears from patients with MS and systemic or eye diseases, and normal controls. Tears were isoelectrofocussed on agarose gel, silver-stained, and immunofixated for IgG. In the cathodal portion of the gel (pH greater than or equal to 8.3), oligoclonal bands were detected in 14 of 21 (67%) MS tear samples. In most cases, these bands were not present in serum. Only 1 of 26 non-MS subjects showed two faint IgG tear bands, which were strongly present in serum. It appears that oligoclonal IgG bands can be detected in tears as well as in CSF of MS patients
85. Lewandowska-Furmanikowa, M. [Experimental studies of the effect of subconjunctival administration of ascorbic acid on changes in pH, pO₂ and pCO₂ of the aqueous humor of the rabbit eye after corneal burn with alkaline solution]. [Polish]. *Klinika Oczna*. 1986 Aug; 88(8):269-72.
86. Mathews, H. M.; Wilson, C. M.; Thompson, E. M., and Moore, J. Combination treatment with ranitidine and sodium bicarbonate prior to obstetric anaesthesia. *Anaesthesia*. 1986 Dec; 41(12):1202-6.
Abstract: The gastric pH and volume were measured in 175 patients undergoing elective, and 313 undergoing emergency, obstetric procedures. Ranitidine 150 mg was administered orally every 6 hours in labour and at least 2 hours before elective Caesarean section. Patients received 20 ml of 8.4% sodium bicarbonate orally immediately prior to induction of anaesthesia. The combination of ranitidine and sodium bicarbonate produced marked alkalinisation of gastric contents (mean pH 8.9). The administration of sodium bicarbonate pre-operatively in patients who received ranitidine less than 2 hours before operation led to satisfactory elevation of gastric pH. Only four patients had a gastric pH less than 2.5, one patient refused any medication, two received only ranitidine and one patient had a long interval from administration of bicarbonate to aspiration of gastric contents. Gastric volumes were high in labouring patients (mean 84 ml) despite administration of ranitidine. The effectiveness of sodium bicarbonate as a single dose antacid therapy prior to obstetric anaesthesia requires further study
87. Chien, D. S. and Schoenwald, R. D. Improving the ocular absorption of phenylephrine. *Biopharmaceutics & Drug Disposition*. 1986 Sep-1986 Oct 31; 7(5):453-62.
Abstract: An oxazolidine prodrug of phenylephrine and the base form of phenylephrine were synthesized, suspended in sesame oil, and tested for mydriatic activity against phenylephrine HCl. The HCl salt was formulated as a viscous aqueous solution and as a sesame oil suspension. A dosing volume of 10 microliter was instilled into rabbit eyes and the pupillary diameter was measured over time. A 0.045 M prodrug suspension was judged equal in mydriatic activity to a 0.45 M viscous solution of phenylephrine HCl with the exception that the time of maximum response occurred 60 min earlier with the prodrug. When phenylephrine base was suspended in sesame oil at 0.045, 0.12, and 0.45 M, the mydriatic activity was also greater than equimolar suspensions of phenylephrine HCl. The pH of tear fluids was also measured over time and found to rise

1.1, 0.70, and 0.30 pH units for 0.45, 0.12, and 0.045 M suspensions of the base form but remain unchanged when phenylephrine HCl was instilled in the rabbit eye. The greater activity associated with the base form of phenylephrine was judged a result of the change in pH to favour the absorption of phenylephrine. This latter approach should be applicable to either weak acids or weak bases with pKa values outside of the normal pH range (7-8) of the tears and in concentrations greater than 0.045 M suspended in a non-aqueous vehicle

88. Yasui, T. Hazardous effects due to alkaline button battery ingestion: an experimental study. *Annals of Emergency Medicine*. 1986 Aug; 15(8):901-6.
Abstract: This study was performed to clarify the mechanism and extent of mucosal injury following button battery ingestion. After surgical implantation of several commercially available button batteries in the stomach or appendix of rats, battery voltage, mucosal pH, and histopathologic change were assessed at eight, 16, 24, and 48 hours. Prior to leakage of the alkali from the battery cell there was a reduction in battery voltage, a rise in mucosal pH, and often ulceration or perforation in the digestive tract due to discharge (electrolytic reaction) from the battery. The extent of mucosal injury varied with battery type. Perforation and death were seen in some animals. The extent of mucosal injury was similar in fasted and nonfasted animals. Electrolytic reactions and mucosal injury occurred in both acidic and nonacidic gastrointestinal sites
89. Lacouture, P. G.; Gaudreault, P., and Lovejoy, F. H. Jr. Clinitest tablet ingestion: an in vitro investigation concerned with initial emergency management. *Annals of Emergency Medicine*. 1986 Feb; 15(2):143-6.
Abstract: To help establish a rational approach to the initial management of Clinitest tablet ingestion, we investigated the effect of number of tablets, volume of diluent, and type of diluent on dissolution time (TD), temperature generation (ΔT), and pH. Dissolution time was independent of the number of tablets and the volume of fluid; however, it was dependent on the type of fluid used. The thermal generation (ΔT) was dependent on the number of tablets and volume of fluid, but was independent of the type of fluid used. The pH changes were independent of the number of tablets and volume of fluid; however, they were greatly dependent on the type of fluid. These data suggest that dissolution is rapid (in seconds) and, therefore, the most effective intervention may occur shortly after ingestion of the tablets; the larger the volume of diluting fluid, the smaller the risk of thermal damage from these ingestions; and orange juice should be considered as a possible diluent because it is capable of reducing the pH of the Clinitest tablet without increasing thermal generation
90. Norn, M. Tear pH after instillation of buffer in vivo. *Acta Ophthalmologica - Supplementum*. 173:32-4, 1985.
Abstract: The pH of the conjunctival fluid was measured with a micro-electrode at the middle of the inferior conjunctival fornix of 160 eyes (86 subjects). After instillation of buffer of pH 5 (in 22 eyes pH 9) the linear course of pH changes was followed until the starting value had been regained. The coefficient of regression K was computed (pH-units/min.). In normal eyes the K-value declines with increasing age from 1.0 to 0.5, corresponding to a return to the starting value after 2 to 5 minutes. The K-value is reduced significantly in keratoconjunctivitis sicca (K = 0.21, pemphigoid (0.36), during local anaesthesia (0.38 +/- 0.03 against 1.04 +/- 0.10 prior to 0.4% oxibuprocain), in the presence of a cotton plug in the inferior fornix, and in wearers of soft contact lenses. The K-value is normal in cases of lacrimal occlusion (owing to overflow), in exophthalmos and endothelial dystrophy, following corneal grafting, in conjunctivitis and keratitis, and in wearers of hard contact lenses. In cadaveric eyes we find incomplete, irregular neutralization. Conclusion: Tear dilution is the most important factor in the elimination of buffered eye drops in vivo, compared with the proper buffering capacities of the tears and the tissue
91. Urtti, A. and Salminen, L. Concentration-dependent precorneal loss of pilocarpine in rabbit eyes. *Acta Ophthalmologica*. 1985 Oct; 63(5):502-6.
Abstract: Precorneal loss of pilocarpine was studied in pigmented and albino rabbits. We instilled 25 microliter of isotonic pilocarpine solution,

pH 6.4, into rabbit eyes and monitored drug concentration in the precorneal tear film. Increased concentration (0.2% - 2.0%) of pilocarpine accelerated precorneal drug loss from the tear film from 0.686 min⁻¹ to 1.064 min⁻¹. This increase was mainly due to induced lacrimation. Polyvinyl alcohol (1.4%) retarded precorneal loss of pilocarpine. The rate of loss was the same in pigmented and albino rabbits. The effects of the changed precorneal loss of pilocarpine on corneal drug absorption are discussed

92. Sigrist, T. and Flury, K. [Death by peroral ingestion of soluble glass (sodium silicate)]. [German]. *Zeitschrift Fur Rechtsmedizin - Journal of Legal Medicine*. 1985; 94(3):245-50.
Abstract: The intake of 0.5l of water glass (sodium metasilicate; colloid pH 12.5) led to death within 1-1.5 h. Autopsy revealed alkali burns of the stomach mucosa. The stomach contained a small amount of liquid with a pH of 11.5. Histologically, numerous bronchioles and alveoles were filled with amorphous material. This material was chemically proved to be condensed water glass. The obstruction of large parts of the lungs by water glass led to an inhibition of alveolar gas diffusion, which may have been the cause of death. The transformation of the water glass from liquid to solid occurred in the lungs by means of the carbonic acid of expiration air. This was made possible because the pH of water glass had been changed by gastric secretions from 12.5 to 11.5. Water glass starts to solidify around pH 11.4-11.3
93. Gachon, A. M.; Bilbaut, T., and Dastugue, B. Adsorption of tear proteins on soft contact lenses. *Experimental Eye Research*. 1985 Jan; 40(1):105-16.
Abstract: To better understand protein deposit formation on contact lenses, a study of adsorption of lacrymal proteins was undertaken. Purified tear proteins were radiolabelled with ¹²⁵I. The time course of adsorption of single protein solutions at various pHs or in mixture systems at pH 7.5 was determined. The maximum amount of lysozyme and albumin adsorbed in the presence of diluted tears was obtained. The influence of an early adsorbed layer on further adsorption was investigated
94. Flynn, W. J.; Mauger, T. F., and Hill, R. M. Corneal burns: a quantitative comparison of acid and base. *Acta Ophthalmologica*. 1984 Aug; 62(4):542-8.
Abstract: A quantitative comparison is made of the effects of two of the most completely dissociating representatives from the pH spectrum, sodium hydroxide and hydrochloric acid, on oxygen uptake by the corneal epithelium. Based on initial observations, a 6 to 1 time ratio in the exposure period (acid, 60 seconds; base, 10 seconds) was found necessary to localize and define similar aerobic effects by the 2 agents on their concentration scales. A further dosage adjustment factor was required, a 5/1 concentration ratio of acid to base, to achieve near parity of the major depressive thresholds of those 2 agents, as well as to illustrate in the resulting graphical model several unique features of each in their aerobic effects on corneal tissue at lower concentrations
95. Basu, P. K.; Avaria, M.; Cutz, A., and Chipman, M. Ocular effects of water from acidic lakes: an experimental study. *Canadian Journal of Ophthalmology*. 1984 Apr; 19(3):134-41.
Abstract: The purpose of this experimental study was to determine the effects on the conjunctiva and cornea of eyes exposed to water from acidic lakes in comparison with water from lakes having a nearly neutral pH. One eye each of 190 rabbits was exposed to an experimental sample of water having a pH of 5.18, 5.04, 4.70 or 4.50. The other eye of each rabbit was simultaneously exposed to a control sample of water having a pH of 6.40 or 6.21. The water was continuously instilled for 15 minutes every day for 7 days. Observations were made daily. The two eyes of each rabbit were compared for conjunctival congestion, corneal staining with fluorescent dye, the granulocyte count and osmolarity of the tears, bacteriologic findings in conjunctival swabs, corneal cell damage, corneal thickness and ultrastructural features of the corneal epithelium. Although some of the rabbits showed a difference of reaction in the two eyes, the majority showed similar reactions to water from the acidic and

nearly neutral lakes

96. McAuley, D. M.; Moore, J.; Dundee, J. W., and McCaughey, W. Oral ranitidine in labour. *Anaesthesia*. 1984 May; 39(5):433-8.
Abstract: Ranitidine 150 mg orally was given every 6 hours to 909 women in labour, while a control group of 378 women received conventional alkali therapy. No differences in incidences of operative intervention, placental retention or post-partum haemorrhage were observed between groups. Gastric sampling during emergency anaesthesia revealed a pH less than 2.5 in four of 51 women who received ranitidine and in two of 31 women who received magnesium trisilicate. Gastric volumes were slightly lower (mean 83 ml) in the study group than in the control group (mean 122 ml). Absorption of ranitidine was greatly slowed following narcotic administration and gastric volume was significantly higher in those patients given narcotics in labour. Apgar scores were similar in both groups of infants, and babies whose mothers were given ranitidine showed no delay in achieving high gastric acidity and no increase in bacterial colonization of the gastro-intestinal tract. Low levels only of ranitidine were found in the blood of babies at 2-3 hours and approximately 12 hours after birth
97. Conrads, H.; Winterhoff, D., and Strotmann, U. [Pros and cons of preservatives in eyedrops. Questionnaire for practitioners and experimental studies with reference to the requirements of the German Pharmacopoeia of August 1978]. [German]. *Klinische Monatsblätter Für Augenheilkunde*. 1984 Mar; 184(3):233-7.
Abstract: The first part of this paper deals with the regulations in the DAB 8/78 stating that eye-drops are to be preserved. A questionnaire prepared by the German Association of Ophthalmologists is analyzed. The four questions put to 353 ophthalmologists and answered by 350 of these concern the need for unpreserved eye-drops because of the danger of allergization; the expiry date once the bottle has been opened; infections due to eye-drops without preservatives; and the need for eye-drops made up by pharmacists. The second part deals with studies on the pH-values of lacrimal fluid in cases of normal and decreased lacrimation, as well as with the bactericidal action of the normal tear fluid containing lysozyme and lactotransferrine and various eye-drops containing preservatives. The authors conclude that the general addition of preservatives to eye-drops, especially to those containing antiphlogistic and astringent substances, is unnecessary. Concerning the expiry date on the bottle, it is suggested that the period of use be extended to three months, thus helping to cut costs
98. Peters, W. J. Alkali burns from wet cement. *Canadian Medical Association Journal*. 1984 Apr 1; 130(7):902-4.
Abstract: When water is added to the dry materials of Portland cement calcium hydroxide is formed; the wet cement is caustic (with a pH as high as 12.9) and can produce third-degree alkali burns after 2 hours of contact. Unlike professional cement workers, amateurs are usually not aware of any danger and may stand or kneel in the cement for long periods. As illustrated in a case report, general physicians may recognize neither the seriousness of the injury in its early stages nor the significance of a history of prolonged contact with wet cement. All people working with cement should be warned about its dangers and advised to immediately wash and dry the skin if contact does occur
99. Chen, C. T.; Toung, T. J.; Haupt, H. M.; Hutchins, G. M., and Cameron, J. L. Evaluation of the efficacy of Alka-Seltzer Effervescent in gastric acid neutralization. *Anesthesia & Analgesia*. 1984 Mar; 63(3):325-9.
Abstract: A commercially available antacid, a mixture of sodium and potassium bicarbonates and citric acid (Alka-Seltzer Effervescent), was evaluated experimentally and clinically for its efficacy in neutralizing 0.1 N HCl and gastric contents. In an in vitro titration study, Alka-Seltzer Effervescent buffered 5-30 times the volume of HCl with a pH between 1.0 and 2.0 to above a pH of 2.5. In an isolated canine pulmonary lobe model, aspiration of the antacid or acid-antacid mixture caused only a mild increase in lobe weight and did not increase intrapulmonary shunting.

In the clinical study, when the antacid was given 5-40 min before administration of general anesthesia in a group of patients for emergency surgery, the pH of the gastric contents in each patient was increased to above 4.0. This contrasts with the control group of patients, which showed 50% (P less than 0.05) of the patients were at risk when no antacid was administered. Preoperative administration of Alka-Seltzer effectively increases the pH of the gastric contents in patients undergoing emergency surgery

100. Picardi, C.; Cesari, M.; Chiavola, E.; Alessi, G.; Manfroni, P.; Di Giorgio, A., and Cantarini, C. [Results of the surgical treatment of esophageal stenosis caused by caustics: clinical, endoscopic, radiological control and pH measurement]. [Review] [172 refs] [Italian]. *Rivista Di Medicina Aeronautica e Spaziale*. 1982 Jan-1982 Dec 31; 47(1-4):143-74.
101. Basu, P. K.; Avaria, M., and Hasany, S. M. Effects of acidic lake water on the eye. *Canadian Journal of Ophthalmology*. 1982 Apr; 17(2):74-8.
Abstract: The normal eyes of 6 men and 21 rabbits were exposed to samples of lake water, one eye to a sample of pH 4.6 and the other to a sample of pH 6.3. The men's eyes were exposed for 5 minutes on four occasions a week apart, whereas the rabbits' eyes were exposed for 15 minutes either on one occasion or once a day for 7 days. In the humans neither sample of water produced symptoms or signs of an adverse effect on the external eye tissues, apart from brief conjunctival congestion after every exposure. In the rabbits the two samples did not appear, in general, to have different effects on the ocular tissues, as judged from the osmolarity and cell count of the tears, conjunctival congestion, corneal staining with fluorescein, corneal permeability and histologic features of the cornea. In a few instances differences were observed, but their pathological significance was not apparent. These data suggest that lake water of a pH as low as 4.6 may not harm healthy eyes, however, larger and broader studies are essential
102. Wrobel, J.; Koh, T. C., and Saunders, J. M. Sodium citrate: an alternative antacid for prophylaxis against aspiration pneumonitis. *Anaesthesia & Intensive Care*. 1982 May; 10(2):116-9.
Abstract: In a double-blind study, 107 patients undergoing elective and emergency surgical procedures were given 15 ml of either sodium citrate 0.3 M or placebo 10 minutes before induction of anaesthesia. Gastric contents were sampled immediately after induction and the pH was measured. The mean pH of the Gastric contents of patients given sodium citrate was 5.67, whereas for those given the placebo it was 3.21 (p less than 0.001). Of patients given sodium citrate 92% had a gastric pH above 3.0 compared with only 37% in the placebo group (p less than 0.001). At the end of surgery gastric contents were emptied as completely as possible and the volume and pH measured. There was no significant difference in the mean volume of gastric contents in the two groups. In neither group was the mean pH at the end of surgery significantly different from that after induction
103. Johnston, J. R.; McCaughey, W.; Moore, J., and Dundee, J. W. A field trial of cimetidine as the sole oral antacid in obstetric anaesthesia. *Anaesthesia*. 1982 Jan; 37(1):33-8.
Abstract: Cimetidine was used as the routine antacid treatment for 1323 parturients. The findings from 70 of those who needed an emergency general anaesthetic are reported. Once sufficient time had elapsed for absorption of the drug, and provided that the dosage regime was adhered to, 96% of the women studied had an intragastric pH above 2.5. Neonatal monitoring revealed no abnormalities related to the cimetidine treatment
104. Coombs, D. W.; Hooper, D., and Pageau, M. Emergency cimetidine prophylaxis against acid aspiration. *Annals of Emergency Medicine*. 1982 May; 11(5):252-4.

Abstract: Preoperative cimetidine (300 mg IV) was given to assess timing and efficacy of prophylactic cimetidine to increase gastric pH in emergency surgical patients. Two-thirds had an initial gastric pH less than or equal to 2.5, with a mean pH of 2.13 +/- 0.60 as a group. Cimetidine administration resulted in a significant increase in mean pH at intubation (3.25 +/- 0.90), with a mean preoperative premedication interval of 59 +/- 20 minutes. However, 20% failed to achieve a gastric pH greater than 2.5 prior to intubation. The mean gastric pH at extubation (5.09 +/- 1.55) was also significantly increased compared to precimetidine and preintubation levels. Prophylactic cimetidine might protect many, but not all, emergency patients from acid-induced aspiration pulmonary injury at intubation or extubation

105. Machida, T. A study of intragastric pH in patients with peptic ulcer--with special reference to the clinical significance of basal pH value. *Gastroenterologia Japonica*. 1981; 16(5):447-58.
Abstract: Determination was made of in situ gastric pH during early morning in fasting state (basal pH) by using wired glass electrodes, and results obtained were analyzed. Analysis of the pattern of variation in intragastric pH at night revealed no substantial difference between normal subjects and patients with peptic ulcer but a tendency to be lower in the latter group. It was also shown that sleeping waves appeared in the electroencephalogram in association with the increase in intragastric pH during sleep at night. The basal pH value was 5.4 +/- 2.1 in patients with gastric cancer, 3.0 +/- 2.2 in those with gastritis, 2.4 +/- 1.9 in those with gastric ulcer, 1.7 +/- 0.2 in normal subjects and 1.3 +/- 0.6 in patients with duodenal ulcer. In gastric ulcer patients more anal site of ulcer lesion was associated with lower mean age of the patients and higher incidence of intestinal metaplastic gastritis of the antral or non-metaplastic type. In patients who underwent partial gastrectomy for peptic ulcer, the pH value in the remnant stomach tended to become higher with the lapse of time in all cases, being constant at about 3 months postoperatively. The decrease in gastric acidity at 12 months after operation was incomplete in patients who underwent emergency gastrectomy for perforated duodenal ulcer but satisfactory in those who underwent selective vagotomy and antrectomy as elective operations
106. Eichler, H. G.; Lenz, K., and Hruby, K. [Accidental ingestion of corrosives by children (author's transl)]. [German]. *Padiatrie Und Padologie*. 1981; 16(4):489-94.
Abstract: Data of the Poison Information Center in Vienna and analysis of the literature indicate: 1) Accidental ingestion of corrosives by children occurs frequently, but rarely causes dangerous complications or sequelae (edema of the larynx, perforation and stricture formation in the esophagus or stomach). This is in contrast to attempted suicides by adults. 2) The first and most important step after the accident is the intake of copious amounts of water. The dangers of neutralizing acid or lye are discussed. 3) Only symptoms and signs, not kind or pH of the caustic agent afford a reliable guide for deciding whether or not the child needs further observation and treatment. This paper deals with first aid measures only, not with further treatment (e.g. shock treatment, prophylaxis of stricture formation etc.)
107. Doroshow, J. H.; Locker, G. Y.; Gaasterland, D. E.; Hubbard, S. P.; Young, R. C., and Myers, C. E. Ocular irritation from high-dose methotrexate therapy: pharmacokinetics of drug in the tear film. *Cancer*. 1981 Nov 15; 48(10):2158-62.
Abstract: Four of 13 patients receiving intermittent high-dose methotrexate therapy experienced recurrent symptoms of ocular irritation (burning, pruritus, "dry eyes") two to seven days after chemotherapy. Ophthalmic examination was unremarkable in symptomatic individuals except for decreased reflex production of tears in some patients. Pharmacokinetic studies of a group of these patients revealed concentrations of methotrexate in tears equivalent to those in plasma at 24 and 48 hours after treatment; these concentrations reached 1×10^{-5} M during the infusion of methotrexate. The occurrence of acidic lacrimal secretions, pH 6.5 in one symptomatic patient, may have contributed to decreased solubility of methotrexate in the fluid of the conjunctival sac

108. Okawada, N.; Mizoguchi, I., and Ishiguro, T. Effects of photochemical air pollution on the human eye--concerning eye irritation, tear lysozyme and tear pH. *Nagoya Journal of Medical Science*. 1979 Mar; 41(1-4):9-20.
109. Carney, L. G. and Hill, R. M. Human tear buffering capacity. *Archives of Ophthalmology*. 1979 May; 97(5):951-2.
Abstract: With the use of a closed chamber microelectrode system, we measured the relative buffering capacities of 490 human tear samples from young healthy adults. The buffering capacities of the 457 waking-hour samples did show small but regular oscillations that were similar to those previously reported for blood and tear pH, but only rarely did the buffering capacity of one sample approach double that of another. The buffering capacities of 33 tear samples, associated with periods of prolonged eye closure (sleep), were not significantly different (P less than 0.5) from those of the open eye
110. Krenzelok, E. P. and Clinton, J. E. Caustic esophageal and gastric erosion without evidence of oral burns following detergent ingestion. *JACEP*. 1979 May; 8(5):194-6.
Abstract: The effects of accidental ingestion of a caustic detergent are studied in the report of 14 patients seen in the Hennepin County Medical Center. Since the history of amount ingested was unclear, all patients underwent endoscopy. Four patients had esophageal injury serious enough to warrant hospitalization. None of the patients had evidence of oropharyngeal burns, thus challenging the validity of the widely held notion that oral lesions nearly always accompany esophageal injury following caustic ingestion. The importance of analyzing the ingested substance is emphasized, as is the need for emergency departments to have wide range pH paper available to help determine the necessity for endoscopy
111. Paterson, C. A.; Eakins, K. E.; Paterson, E.; Jenkins, R. M. 2nd, and Ishikawa, R. The ocular hypertensive response following experimental acid burns in the rabbit eye. *Investigative Ophthalmology & Visual Science*. 1979 Jan; 18(1):67-74.
Abstract: Following application of 50 microliter of 2N hydrochloric acid to the rabbit cornea, the intraocular pressure rapidly increases and remains markedly elevated for up to 3 hr. The initial rapid increase in intraocular pressure appears to be the result of acid-induced shrinkage of the outer collagenous coats of the eye. The sustained rise in intraocular pressure is mediated in part by prostaglandin release. Increased prostaglandin-like activity, determined in the aqueous after an acid burn, was greatly inhibited by pretreatment of rabbits with indomethacin and to a much lesser extent by pretreatment with imidazole. Both indomethacin and imidazole essentially abolished the sustained elevation of intraocular pressure after an acid burn. Analysis of changes in pH and protein level in the aqueous implies that the stimulus for prostaglandin release within the eye is the penetration of hydrogen ions into the aqueous humor, with resultant intraocular trauma
112. Ancona Alayon and Aranda Martinez, J. G. [Ulcerative contact dermatitis caused by premixed concrete (cement burns)]. [Spanish]. *Medicina Cutanea Ibero-Latino-Americana*. 1978; 6(3-4):209-12.
Abstract: Cement dermatitis manifests clinically as a chronic dermatitis of irritative character, due to its alkaline nature and as allergic contact dermatitis produced by sensitization to chromium and cobalt occurring as trace elements. the present report deals with a mason without previous dermatitis, presenting bullae, ulcers and necrosis in lower limbs, short time after incidental contact at work, with premixed concrete. The clinical manifestations, such as short evolution, clear limitation to sites in close contact with concrete, negativity to standard patch testing and good prognosis with early treatment, are mentioned. The acute irritant nature of the disease is clear, in opposition to the classical manifestations of cement dermatitis. The need of studies of the chemical properties of this material including pH, alkalinity and the possible roll of additives employed, is part of the strategy for prevention of occupational dermatitis in the building trade, which should include also, information of hazards

and proper training in their trade

113. Wynne, J. W. and Modell, J. H. Respiratory aspiration of stomach contents. [Review] [88 refs]. *Annals of Internal Medicine*. 1977 Oct; 87(4):466-74.
Abstract: The aspiration of stomach contents is a common clinical problem of concern to all physicians. Its consequences are varied, depending on the amount and distribution of the aspirate, its pH, and the presence or absence of food, particulate matter, and bacteria. Because multiple factors are involved, aspiration of stomach contents can lead to several distinct syndromes of pulmonary injury, all of which unfortunately have been labeled "aspiration pneumonitis." We review the pathophysiology of each of these syndromes and discuss important diagnostic and therapeutic consequences. [References: 88]
114. Hill, R. M. and Carney, L. G. The closed eye environment: pH. *American Journal of Optometry & Physiological Optics*. 1976 Nov; 53(11):718-9.
Abstract: Earlier observations showed that unbuffered bathing media held by a closed chamber against the eye would become progressively more acid over a few minutes. Such shifts, however, when examined for the naturally closed eye, even for prolonged periods, were found to be within 1 pH unit of the open-eye measured average
115. Longwell, A.; Birss, S.; Keller, N., and Moore, D. Effect of topically applied pilocarpine on tear film pH. *Journal of Pharmaceutical Sciences*. 1976 Nov; 65(11):1654-7.
Abstract: Changes in tear film pH were observed during the 1st hr after instillation of pilocarpine in various dosage forms to the rabbit eye. In anesthetized rabbits, with periodic blinking induced electrically, commercial formulations of pilocarpine salts applied as drops or a spray acutely lowered tear film pH by 1.1-1.6 pH units. The pH remained below pretreatment levels for 45-greater than 60 min after instillation. Pilocarpine base, administered continuously at the rates of 20 or 80 mug/hr from ocular therapeutic systems, had little or no effect on tear film pH in this same animal preparation. The reduction in tear film pH produced by pilocarpine eyedrops or spray solution is attributable to the acid pH and buffer capacity of these solutions. Delivery of pilocarpine base without pH change was achieved with ocular therapeutic systems, because the drug (pKa = 7.07) was delivered free, or virtually so, of excipients. These observed differences in tear film pH after application may partially explain the four- to eightfold reduction in total effective pilocarpine dose with ocular therapeutic systems compared to eyedrops or spray, since the cornea is less permeable to ionized than to unionized molecules
116. Carney, L. G. and Hill, R. M. Other hydrophilic lens environments: pH. *American Journal of Optometry & Physiological Optics*. 1976 Sep; 53(9 Pt 1):456-8.
Abstract: Although hydrophilic contact lenses are specifically designed for compatibility with the eye environment, i.e., the tears, they will, with the exception of continuous wear types, spend a significant fraction of their daily cycle in other solutions. This investigation explores the pH characteristics of certain of those alternative media
117. ---. Human tear pH. Diurnal variations. *Archives of Ophthalmology*. 1976 May; 94(5):821-4.
Abstract: Using a closed chamber microelectrode system, the tear pH levels of sixteen subjects were monitored throughout the waking extent of five days. In addition to the absolute mean pH differences found among subjects, diurnal patterns of pH change could be identified for the majority. The amplitudes and periods of these cycloid patterns, however, were distinctive to each individual. Also, tear pH levels following periods of prolonged eye closure were found to be notably more acid than those associated with the waking hours

118. Cejkova, J.; Lojda, Z.; Obenberger, J., and Havrankova, E. Alkali burns of the rabbit cornea. II. A histochemical study of glycosaminoglycans. *Histochemistry*. 1975 Sep 7; 45(1):71-5.
Abstract: In alkali burned rabbit cornea the stainability of glycosaminoglycans in cold microtome sections was investigated. Staining by Alcian blue in 3% acetic acid, Alcian blue in various MgCl₂ concentration and toluidine blue (pH 4.5) was employed. From the 1st to the 4th experimental day the intensity of reactions was decreased. This is most probably due to an increased hydration of the corneal stroma. On the 7th day hydration was markedly suppressed and reached nearly the normal level. In this time interval a decreased stainability of glycosaminoglycans was seen accompanied by a complete loss of staining in the marginal zone. On the 14th day the stainability in the traumatized area began to restore and in the marginal zone appeared. On the 32nd day the staining intensity of both areas was normalised, however when lower concentrations of MgCl₂ were used; in the presence of higher concentrations of MgCl₂ the decreased staining intensity persisted and points to a lower sulfatation of glycosaminoglycans. This was particularly remarkable in the area bordering the injured zone. This decrease runs parallel to the increased activities of acid glycosidases (especially of acid beta-galactosidase) which were reported previously
119. Laux, U.; Roth, H. W.; Krey, H., and Steinhardt, B. [Aqueous humor pH in experimental lye burns and influence of different treatment measures (author's transl)]. [German]. *Albrecht Von Graefes Archiv Fur Klinische Und Experimentelle Ophthalmologie*. 1975; 195(1):33-40.
Abstract: 300 rabbit corneas were burned for 1 minute by applying a filter paper of 10 mm diameter soaked in different concentrations of NaOH. The aqueous humor pH was then measured at certain time intervals and after different treatment methods until the physiologic pH of 7.6 was reached. The results were statistically analysed. Group 1, 2 and 3 were burned in 1n NaOH, 3n NaOH, and 6n NaOH respectively without any treatment. In these groups a "therapeutic" pH-level of 8.5 was measured on an average 0.5, 2.5 and 5 hours after the burn (Table 1 and Fig. 2). Group 4 and 5 again were burned with 6n NaOH. In group 4 the burn was followed by constant irrigation with physiologic saline solution by means of the Morgan Therapeutic Lens (Fig. 1a and b). With this regimen a pH of 8.5 was reached after 2.5 hours (Table 1 and Fig. 3). In group 5 the physiologic saline solutions was replaced by a buffer solution (Isogutt) and a pH of 8.5 was measured after only one hour (Table 1 and Fig. 3). Based upon these results it is felt that severe lye burns should be treated by constant irrigation with a buffer solution for several hours. A treatment that can easily be performed by use of the Morgan Therapeutic Lens
120. Paterson, C. A.; Pfister, R. R., and Levinson, R. A. Aqueous humor pH changes after experimental alkali burns. *American Journal of Ophthalmology*. 1975 Mar; 79(3):414-9.
Abstract: Following application of 2N sodium hydroxide, or 8.1N ammonium hydroxide to rabbit cornea, the aqueous humor pH reached a maximum of 10.2, 11.9, and 12 within six minutes following 20-, 50-, and 100- μ l sodium hydroxide burns, respectively; after two hours the pH had fallen to 8.5, 10, and 10.5. The maximum rise following application of 100- μ l of ammonium hydroxide was 10.8, declining to about 9 at two hours. The fall in pH following a 100- μ l sodium hydroxide burn was not greatly influence by external lavage. However, the pH was significantly lowered (12 to 10) by paracentesis alone and further reduced by immediate or delayed intracameral administration of phosphate buffer. On the basis of these results moderately severe and severe alkali burns of the eye should be treated by paracentesis and if possible with anterior chamber reformation with a sterile solution
121. Smith, R. S. and Shear, G. Corneal alkali burns arising from accidental instillation of a hair straightener. *American Journal of Ophthalmology*. 1975 Apr; 79(4):602-5.
Abstract: A patient sustained mild bilateral alkali burns of the cornea following ocular exposure to a commercial hair straightening preparation.

This compound and three other products all had an alkaline pH which was not reduced to neutrality by the neutralizer provided. Corneal alkali burns similar to those seen in our patient were produced in experimental animals after brief exposure. Histologic changes were primarily limited to the cornea. The warning against ocular exposure printed on the containers or package insert is not sufficiently emphatic to protect the consumer

122. Gruber, R. P.; Laub, D. R., and Vistnes, L. M. The effect of hydrotherapy on the clinical course and pH of experimental cutaneous chemical burns. *Plastic & Reconstructive Surgery*. 1975 Feb; 55(2):200-4.
123. Graupner, O. K. [Effect of paracentesis on the change in pH in the anterior chamber of rabbit eyes after experimental burning with acid or base]. [German]. *Albrecht Von Graefes Archiv Fur Klinische Und Experimentelle Ophthalmologie*. 1973; 186(1):67-72.
124. ---. [Significance of the corneal epithelium for the pH changes in the anterior chamber of the rabbit eye following experimental cautery with acid]. [German]. *Albrecht Von Graefes Archiv Fur Klinische Und Experimentelle Ophthalmologie*. 1970; 181(1):65-70.
125. Graupner, O. K. and Hausmann, C. M. [The alteration of the pH in the anterior chamber of the rabbit eye burned with smallest volumes of acid and base in concentrations useful in laboratory work]. [German]. *Albrecht Von Graefes Archiv Fur Klinische Und Experimentelle Ophthalmologie*. 1970; 180(1):60-71.
126. Graupner, O. K. [Changes in the pH value in the anterior chamber of the rabbit eye following corrosion and its influencing by therapeutic procedures]. [German]. *Acta Biologica Et Medica Germanica*. 1968; 21(6):870-5.
127. Graupner, O. K. and Hausmann, C. M. [The alternation of the pH in the anterior chamber of the rabbits eye burned with smallest volumes of high concentrated acid and base]. [German]. *Albrecht Von Graefes Archiv Fur Klinische Und Experimentelle Ophthalmologie*. 1968; 176(1):48-53.
128. Fine, K. D. and Schiller, L. R. AGA technical review on the evaluation and management of chronic diarrhea. *Gastroenterology* 1999 Jun;116(6):1464-86.

Abstract: This literature review and the recommendations therein were prepared for the American Gastroenterological Association Clinical Practice and Practice Economics Committee. The paper was approved by the committee on September 27, 1998.