Normandy House  Nursing Home
Melrose MA
1967-1970
FIG. 1.—A chronic hemodialysis unit (3 beds) in a "satellite" center. In this stance the unit is located in an extended care facility (i.e., medicare), and is able comfortably carry a 9-patient load.
Normandy House Dialysis Unit
Melrose MA
1967-1970

Babcock Street Dialysis Unit
Brookline MA
1971-1978
Fig. 1. Example of batch-type dialysate supply system. Makes dialysate for eight dialyzers.
Public Law 92-603
92nd Congress, H. R. 1
October 30, 1972

An Act

To amend the Social Security Act, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act, with the following table of contents, may be cited as the “Social Security Amendments of 1972”.
Normandy House Dialysis Unit
Melrose MA
1967-1970

Babcock Street Dialysis Unit
Brookline MA
1971-1978

The Kidney Center
Brookline MA
1976-1998
Incident & prevalent patient counts by modality

by modality

NMC ➔ FMC
Largest Provider
34% of all dialysis Patients

Incident

<table>
<thead>
<tr>
<th>Modality</th>
<th>Number of patients (in thousands)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hemodialysis (2010: 105,923)</td>
<td></td>
</tr>
<tr>
<td>Peritoneal dialysis (7,703)</td>
<td></td>
</tr>
<tr>
<td>Total dialysis (114,083)</td>
<td></td>
</tr>
<tr>
<td>Transplant (2,863)</td>
<td></td>
</tr>
</tbody>
</table>

Prevalent

<table>
<thead>
<tr>
<th>Modality</th>
<th>Number of patients (in thousands)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hemodialysis (2010: 383,992)</td>
<td></td>
</tr>
<tr>
<td>Peritoneal dialysis (29,733)</td>
<td></td>
</tr>
<tr>
<td>Transplant (179,361)</td>
<td></td>
</tr>
<tr>
<td>OPTN transplant wait list (87,932)</td>
<td></td>
</tr>
</tbody>
</table>

2012 US Renal Data System
# FRESENIUS MEDICAL CARE

<table>
<thead>
<tr>
<th></th>
<th>North America</th>
<th>Europe/Middle East/Africa</th>
<th>Latin America</th>
<th>Asia-Pacific</th>
<th>Total 2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dialysis clinics</td>
<td>1,838</td>
<td>600</td>
<td>218</td>
<td>242</td>
<td>2,898</td>
</tr>
<tr>
<td>Dialysis patients</td>
<td>142,319</td>
<td>48,346</td>
<td>25,381</td>
<td>17,110</td>
<td>233,156</td>
</tr>
<tr>
<td>Treatments (in millions)</td>
<td>21.61</td>
<td>6.61</td>
<td>3.68</td>
<td>2.50</td>
<td>34.39</td>
</tr>
</tbody>
</table>
Hemodialysis-related problems in patients with diabetes mellitus

SAMIR D. KASSISSIEH, MICHAEL C. YEN, J. MICHAEL LAZARUS, EDMUND G. LOWRIE, H. HOWARD GOLDSMITH, FRANK J. TAKACS, CONSTANTINE L. HAMPERS and JOHN P. MERRILL

Departments of Medicine, Harvard Medical School at the Peter Bent Brigham Hospital and New England Deaconess Hospital and Joslin Clinic, Boston, Massachusetts

Fig. 1. Survival of juvenile and adult-type diabetic patients on hemodialysis compared with survival rates of the general dialysis population in the National Dialysis Registry [2] and at the Peter Bent Brigham Hospital [3].

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Hemodialysis and Transplantation in Adults With Polycystic Renal Disease

J. Michael Lazarus, MD; George L. Bailey, MD; Constantine L. Hampers, MD; and John P. Merrill, MD

JAMA, Sept 27, 1971 • Vol 217, No 13
EFFECTS OF BILATERAL NEPHRECTOMY ON
HEMODYNAMICS AND BODY COMPOSITION IN
PATIENTS WITH CHRONIC RENAL FAILURE

ROBERT M. ZOLLINGER, JR., M.D., JOHN J. SKILLMAN, M.D.,
F.A.C.S., J. ROBERT W. GUMPERT, F.R.C.S.,
CONSTANTINE L. HAMPERS, M.D., GEORGE L. BAILEY, M.D.
AND JOHN P. MERRILL, M.D.

A Hemodynamic Evaluation of Bilateral
Nephrectomy and Hemodialysis
in Hypertensive Man

By CONSTANTINE L. HAMPERS, M.D., JOHN J. SKILLMAN, M.D.,
JOHN H. LYONS, M.D., JOHN E. OLSEN, M.D.,
AND JOHN P. MERRILL, M.D.

Circulation, Volume XXXV, February 1967
Fig. 6. This 37-year-old patient with malignant hypertension and congestive heart failure unresponsive to diazoxide, diuretics, digoxin, and thoracentesis received 3 hemodialyses with a resultant 10 kg weight loss. Despite dialysis and intensive antihypertensive therapy there was progressive congestive heart failure and persistent malignant hypertension. After bilateral nephrectomy, the patient had prompt amelioration of blood pressure with reduction in heart size, loss of aortic insufficiency murmur, and improvement in cardiovascular symptoms, mentation, and vision.
Cardiovascular disease in uremic patients on hemodialysis

J. Michael Lazarus, Edmund G. Lowrie, Constantine L. Hampers and John P. Merrill

Department of Medicine, Peter Bent Brigham Hospital, Boston, Massachusetts

Presented at the Conference on Adequacy of Dialysis, Monterey, California, March 20–22, 1974; sponsored by the Artificial Kidney-Chronic Uremia Program of the National Institute of Arthritis, Metabolism, and Digestive Diseases.

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Vol. 290 No. 13

The New England Journal of Medicine

EDITORIALS

CARDIOVASCULAR DISEASE IN DIALYSIS PATIENTS

Edmund G. Lowrie, M.D.
J. Michael Lazarus, M.D.
C. L. Hampers, M.D.
John P. Merrill, M.D.
Subtotal Parathyroidectomy in Chronic Renal Failure: A Seven-Year Experience in a Dialysis and Transplant Program

Richard E. Wilson, M.D., Constantine L. Hampers, M.D., Daniel S. Bernstein, M.D., James W. Johnson, M.D., John P. Merrill, M.D.

From the Departments of Surgery and Medicine of the Harvard Medical School at the Peter Bent Brigham Hospital, Boston, Massachusetts

Vol. 174 · No. 4

THE PLACE OF SUBTOTAL PARATHYROIDECTOMY IN THE MANAGEMENT OF PATIENTS WITH CHRONIC RENAL FAILURE

A. I. Katz, C. L. Hampers, R. E. Wilson,
D. S. Bernstein, A. Wachman, and J. P. Merrill

Complications in hemodialysis: An overview

Principal discussant: J. Michael Lazarus

Harvard Medical School and Peter Bent Brigham Hospital, Boston, Massachusetts

Factors in the dialysis regimen which contribute to alterations in the abnormalities of uremia

Edmund G. Lowrie, Steven M. Steinberg, Malcolm A. Galen, Stephan A. Gagneux, J. Michael Lazarus, Michael N. Gottlieb and John P. Merrill

Departments of Medicine, Peter Bent Brigham Hospital and Harvard Medical School, Boston, Massachusetts

THE UREA REDUCTION RATIO AND SERUM ALBUMIN CONCENTRATION AS PREDICTORS OF MORTALITY IN PATIENTS UNDERGOING HEMODIALYSIS

INITIAL CLINICAL EVALUATION OF THE HOSPITAL ARTIFICIAL KIDNEY SYSTEM


PERFORMANCE AND CLINICAL USE OF A CONVERTIBLE HEMODIALYSIS (HD) - ULTRAFILTRATION (UF) SYSTEM


CONTROLLED ULTRAFILTRATION (UF) WITH HEMODIALYSIS (HD): ANALYSIS OF COUPLING BETWEEN CONVECTIVE AND DIFFUSIVE MASS TRANSFER IN A NEW HD-UF SYSTEM


Biocompatibility of dialysis membranes: Effects of chronic complement activation

RAYMOND M. HAKIM, DOUGLAS T. FEARON, and J. MICHAEL LAZARUS
with the technical assistance of CYNTHIA S. PERZANOWSKI

Departments of Medicine and Immunology, Brigham and Women’s Hospital, and Harvard Medical School, Boston, Massachusetts
Comparison of the study groups in the National Cooperative Dialysis Study and a description of morbidity, mortality, and patient withdrawal

Thomas F. Parker, Nan M. Laird, and Edmund G. Lowrie

Clinical example of pharmacokinetic and metabolic modeling: Quantitative and individualized prescription of dialysis therapy

Edmund G. Lowrie and John A. Sargent

National Cooperative Dialysis Study

Effect of the Hemodialysis Prescription on Patient Morbidity — Report from the National Cooperative Dialysis Study

E. G. Lowrie, M.D., N. M. Laird, Ph.D., T. F. Parker, M.D., and J. A. Sargent, Ph.D.

Original Article

The urea clearance × dialysis time product (Kt) as an outcome-based measure of hemodialysis dose


Fresenius Medical Care (NA), Lexington, Massachusetts; University of California, San Francisco, California; and Harvard Medical School & Brigham and Women’s Hospital, Boston, Massachusetts, USA

Measurement of dialyzer clearance, dialysis time, and body size: Death risk relationships among patients

Edmund G. Lowrie, Zhensheng Li, Nordi Osthun, and J. Michael Lazarus

Fresenius Medical Care (North America), Lexington, Massachusetts
EFFECT OF DIALYSIS DOSE AND MEMBRANE FLUX IN MAINTENANCE HEMODIALYSIS

Garabed Eknoyan, M.D., Gerald J. Beck, Ph.D., Alfred K. Cheung, M.D., John T. Daugirdas, M.D., Tom Greene, Ph.D., John W. Kusek, Ph.D., Michael Allon, M.D., James Bailey, M.D., James A. Delmez, M.D., Thomas A. Depner, M.D., Johanna T. Dwyer, D.Sc., R.D., Andrew S. Levey, M.D., Nathan W. Levin, M.D., Edgar Milford, M.D., Daniel B. Ornt, M.D., Michael V. Rocco, M.D., Gerald Schulman, M.D., Steve J. Schwab, M.D., Brendan P. Teyhan, M.D., and Robert Toto, M.D., for the Hemodialysis (HEMO) Study Group*


Dialysis dose and the effect of gender and body size on outcome in the HEMO Study

Developments in ESRD Therapy

- Measure of Adequacy
- Ultrafiltration control
- Bicarbonate Dialysate
- Single Pass dialysate
- AV Fistula
- CAPD & APD
- Understanding of Role of Protein / Calorie Intake
- Biocompatible dialyzer membranes
- Hollow Fiber Kidney
- On-line Measurement of adequacy
- IV Vitamin D
- Erythropoietin Stimulating Agents
Some statistical methods for use in assessing the adequacy of hemodialysis

Edmund G. Lowrie, J. Michael Lazarus, C. L. Hampers and John P. Merrill

Presented at the Conference on Adequacy of Dialysis, Monterey, California, March 20-22, 1974; sponsored by the Artificial Kidney-Chronic Uremia Program of the National Institute of Arthritis, Metabolism, and Digestive Diseases.

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Death Risk in Hemodialysis Patients: The Predictive Value of Commonly Measured Variables and an Evaluation of Death Rate Differences Between Facilities

Edmund G. Lowrie, MD. and Nancy L. Lew, SM

Illustrating Use of a Clinical Data System: The NMC-FMC System

Edmund G. Lowrie

Quantity of Data in FMCNA Database

- >980K patients
- >183K active patients
- >227 million HD treatments
- >903 million medication administrations
- >969 million lab results

- last updated 01/24/2013
External Uses of Data

• Data Collaboration with Academic Programs
  – Harvard School of Public Health
  – Brigham & Women’s Hospital/HMS
  – Massachusetts General Hospital/HMS
  – Duke University
  – University of Pennsylvania School of Medicine
  – Maine Medical Center
  – University of North Carolina
  – Vanderbilt University
  – Mount Sinai
  – University of Michigan (DOPPS)

• Data Collaboration with Medical Directors
• Data Sales to Pharmaceutical and other Medical Companies
• Data Collaboration with Governmental Agencies
  – USRDS
  – CDC
  – AHQR
• Advocacy with fiscal intermediaries and policy makers
  – CMS
  – MedPAC
  – FDA
PBBH/BWH
Clinical Nephro-Epidemiology in CRF & ESRD
Development from 1948-2013

John Merrill
Gus Hampers  Ted Hager
George Bailey
Ed Lowrie  Mike Lazarus
Ray Hakim
Bill Mitch
Bill Owen  Jon Himmelfarb
Glenn Chertow
Ted Steinman
Gary Curhan
Sus Waikar
John Forman
Eduardo Lacson
Lewis Brenner
Wolfgang Winkelmeyer
Rob Brenner
Steve Brunelli
Ajay Singh
Kevin Tucker
David Mount

HMS School of Public Health
The first studies of individual kidney function were developed to further understanding of hypertension and nephritis.

Development of the artificial Kolff-Brigham kidney by Drs. George W. Thorn, Carl W. Walter, and John P. Merrill in 1948.

The first kidney transplantation between identical twins (isograft, 1954) and transplantations between unrelated individuals (heterografts, 1952-1962) by a team of all four services, especially by Drs. John P. Merrill, Joseph E. Murray, J. Hartwell Harrison, and David Hume in the transplant work.
CHMC transplant surgeon, Dr. Ray Levey and Dr. Michael Lazarus, Director of CHMC Dialysis Unit with youngest mother/daughter transplant.
~ 1974