

MEDICAL GRAND ROUNDS

PARKLAND MEMORIAL HOSPITAL

September 28, 1961

55-year-old [redacted] male

1st [redacted] admission [redacted] to [redacted] /60

History of alcoholism. Entered with upper GI bleeding. Physical examination: no jaundice, few spider angioma, palmar erythema. Liver down 4 fingers - firm, non-tender, not nodular. No spleen or ascites.

GI series negative. Esophagoscopy: varices lower 1/3 of esophagus.

Bleeding stopped spontaneously; patient received no iron or transfusions.

Discharge diagnoses: Laennec's cirrhosis, portal hypertension, esophageal varices with hemorrhage, alcoholism.

2nd [redacted] admission [redacted] to [redacted] /60

Upper GI bleeding. Physical examination: essentially as before. No testicular atrophy.

GI series: esophageal varices, no ulcer. Splenic pressure 430 mm. saline. Splenogram - 1 film - patent splenic and portal vein.

End-to-side portacaval shunt. No description of liver.

Tissue removed - a lymph node revealed massive hemosiderosis.

Received Fergon 300 mg. 2x/day for one week.

Lost 2-3000 cc. blood. Received no transfusions.

3rd [redacted] admission [redacted] to [redacted] /60, for treatment of wound infection.

4th [redacted] admission [redacted] /61 to present

Patient continued work as a cook. Food intake has been poor. Continued to imbibe, claims only 1-2 cans of beer per day. For 2 months, complained of weakness, dyspnea on exertion and progressive swelling of his legs. Received 5 different medicines from local physician - identity still not known. For a week prior to admission, he experienced increasing somnolence. He became irrational, incontinent, and was admitted to the hospital.

Physical examination: Disoriented. No fetor hepaticus described. Skin appeared gray. No icterus. Spider angioma on shoulders. No palmar erythema, gynecomastia or clubbing. Fundi normal. Bilateral basilar rales. Heart border 2 cm. lateral to left midclavicular line, RSR, A2 > P2, no murmurs or gallop. Abdomen: liver down 4 fingers, 1 spleen or left lobe of liver. Testes normal size and consistency. Bilateral edema of lower extremities to mid-thigh.

Coincident with neomycin, protein restriction, supportive care, rapidly became alert, edema has decreased.

Liver biopsy: portal cirrhosis, extensive iron deposition in parenchymal, Kupffer, bile duct cells and in macrophages in portal connective tissue.

Bone marrow: increased iron.

Laboratory Data

	1960	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	Portacaval Shunt,	[REDACTED]	[REDACTED]	1961
Hemoglobin	12	11.4			12.4		12.5	11.9	7.7-9.8
Platelets				70-130,000			160,000		110,000
FBS									134, 96
Bilirubin, total	4.2	2.8	1.9	0.8			1.1	1.2	1.0, 0.6
Ceph. Floc.	2+	1+	3+						4+
Thymol Turbidity		2.4	6.4						9.7
Alk. Ph.ase	8.0	13.7	2.9	5.0			13.3	6.7	6.4-9.8
SGOT									53-77
BSP		38	32						
Total Protein	6.4			5.2					5.0-5.8
Albumin	3.9			3.3					1.9-2.1
Globulin	2.5			2.0					3.9-2.0
Prothrombin, %	100	100		100					100

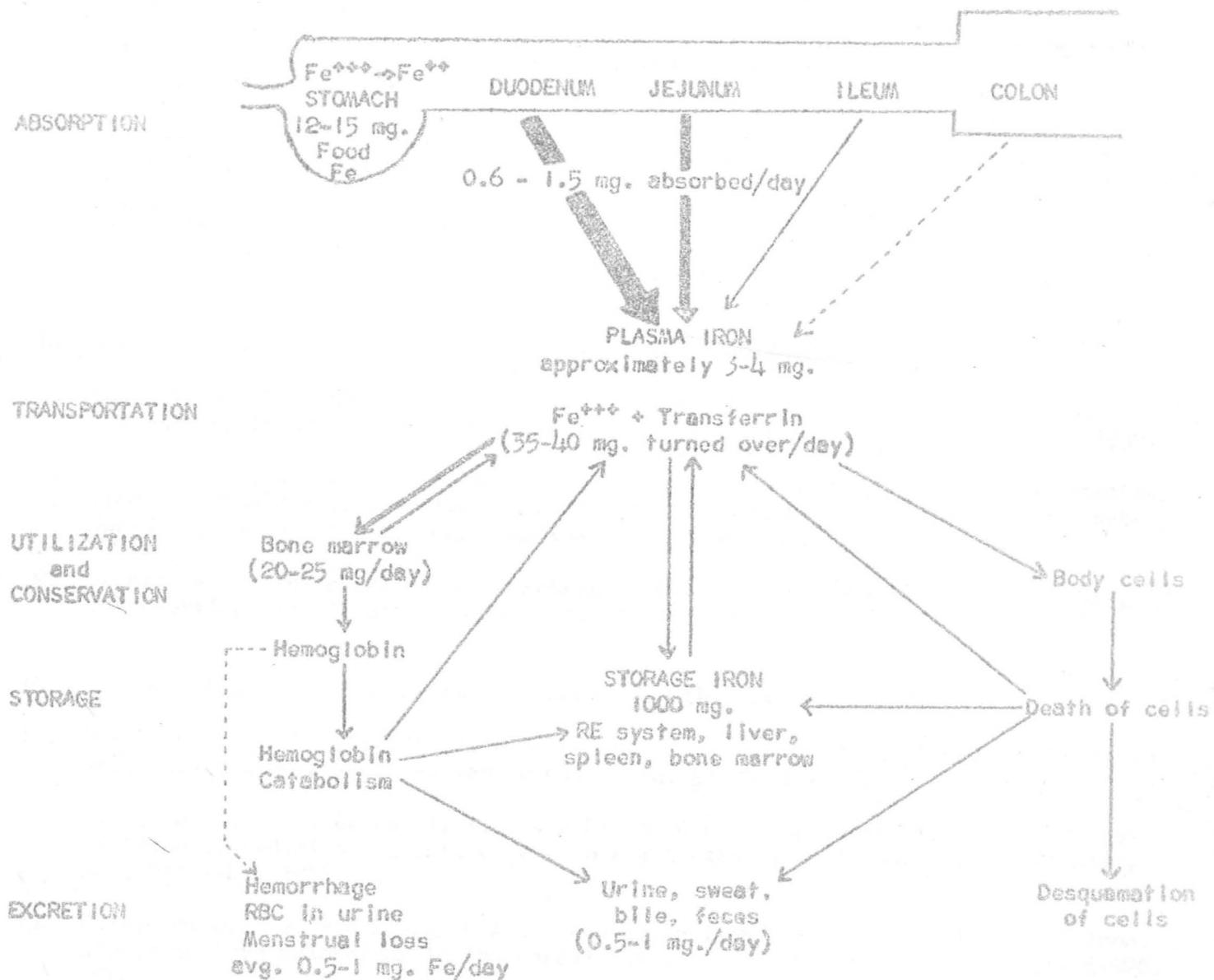
Serum Iron 106 µg.%

EKG normal

Circulation time 18 sec.

Venous pressure 24 cm. saline

HIGHLIGHTS OF IRON METABOLISM



BIBLIOGRAPHY

Reviews and Comprehensive Articles

1. Sheldon, J.: *Hemochromatosis*. London, Oxford University Press, 1935.
2. Finch, S.C., and Finch, C.A.: Idiopathic hemochromatosis, an iron storage disease. *Medicine* 34:381-430, 1955.
3. Dubin, I.N.: Idiopathic hemochromatosis and transfusion siderosis. *Am. J. Clin. Path.* 25:514-542, 1955.
4. Peterson, R.E.: Hemochromatosis in The Metabolic Basis of Inherited Disease. McGraw-Hill Book Co., Inc., 1960, pp. 839-866.

Iron Metabolism

5. Wallerstein, R.O., and Mettier, S.R.: Editors of *Iron in Clinical Medicine*. University of California Press, 1958.
6. Beutler, E.: Iron metabolism. *Ann. Rev. Med.* 12:195-210, 1961.
7. Haskins, D., Stevens, A.R., Jr., Finch, S. and Finch, C.A.: Iron metabolism. Iron stores in man as measured by phlebotomy. *J. Clin. Invest.* 31:543-547, 1952.
8. Chodos, R.B., Ross, J.F., Apt, L., Pollicove, M. and Halkett, J.A.E.: The absorption of radioiron labeled foods and iron salts in normal and iron deficient subjects and in idiopathic hemochromatosis. *J. Clin. Invest.* 36:314-326, 1957.
9. Krantz, S., Goldwasser, E. and Jacobson, L.O.: Studies on erythropoiesis. XIV. The relationship of humoral stimulation to iron absorption. *Blood* 14:654-661, 1959.
10. Finch, C.A.: Body iron exchange in man. *J. Clin. Invest.* 38:392, 1959.
11. Bothwell, T.H., Pirzio-Biroli, G. and Finch, C.A.: Iron absorption. I. Factors influencing absorption. *J. Lab. & Clin. Med.* 51:24-36, 1958.
12. Pirzio-Biroli, G., Bothwell, T.H. and Finch, C.A.: Iron absorption. II. The absorption of radioiron administered with a standard meal in man. *J. Lab. & Clin. Med.* 51:37-48, 1958.
13. Pirzio-Biroli, G. and Finch, C.A.: Iron absorption. III. The influence of iron stores on iron absorption in the normal subject. *J. Lab. & Clin. Med.* 55:216-220, 1960.
14. Beutler, E. and Buttenwieser, E.: The regulation of iron absorption. I. A search for humoral factors. *J. Lab. & Clin. Med.* 55:274-280, 1960.
15. Dowdle, E.B., Schechter, D. and Schenker, H.: Active transport of Fe⁵⁹ by everted segments of rat duodenum. *Am. J. Physiol.* 198:609-613, 1960.

Serum Iron and Iron Binding Capacity

16. Mandel, E.E.: Serum iron and iron-binding capacity in clinical diagnosis. *Clinical Chem.* 5:1-12, 1959.
17. Peterson, R.E.: The serum iron in acute hepatitis. *J. Lab. & Clin. Med.* 39:225-236, 1952.
18. Higginson, J., Keeley, K.J., Andersson, M. and Walker, A.R.P.: Serum iron levels in siderosis due to habitually excessive iron intake. *J. Clin. Invest.* 36:1723, 1957.
19. Hathorn, M., Gillman, T., Canham, P.A.S. and Lamont, N.M.: Plasma iron and iron binding capacity in African males with siderosis. *Clin. Sci.* 19:35-43, 1960.

Manifestations, Differential Diagnosis

20. MacDonald, R.A.: Idiopathic hemochromatosis. A variant of portal cirrhosis and idiopathic hemosiderosis. *AMA Arch. Int. Med.* 107:606-616, 1961.
21. Schwartz, S.O.: Exogenous hemochromatosis. *Am. J. Clin. Path.* 26:744-749, 1956.
22. Rather, L.J.: Hemochromatosis and hemosiderosis. Does iron overload cause diffuse fibrosis of the liver? *Am. J. Med.* 21:857, 1956.
23. MacDonald, R.A. and Mallory, G.K.: Hemochromatosis and hemosiderosis. Study of 211 autopsied cases. *AMA Arch. Int. Med.* 105:686-700, 1960.
24. Zimmerman, H.J., Chomet, B., Kulesh, M.H. and McWhorter, C.A.: Hepatic hemosiderin deposits. *Arch. Int. Med.* 107:494-503, 1961.
25. Richter, G.W.: The nature of storage iron in idiopathic hemochromatosis and in hemosiderosis. Electron optical, chemical, and serologic studies on isolated hemosiderin granules. *J. Exp. Med.* 112:551, 1960 (Oct. 1).
26. Bassis, M. and Carroll, J.: A comparative study of hemochromatosis by electron microscopy. *Gastroenterology* 37:538-549, 1959.
27. Bell, E.T.: The relation of portal cirrhosis to hemochromatosis and to diabetes mellitus. *Diabetes* 4:435-446, 1955.
28. Lonergan, P. and Robbins, S.L.: Absence of intercapillary glomerulosclerosis in the diabetic patient with hemochromatosis. *New Eng. J. Med.* 260:367-370, 1959.
29. Becker, D. and Miller, M.: Presence of diabetic glomerulosclerosis in patients with hemochromatosis. *New Eng. J. Med.* 263:367-373, 1960.
30. Koszewski, B.J.: Occurrence of megaloblastic erythropoiesis in patients with hemochromatosis. *Blood* 7:1182-1195, 1952.
31. Granville, N. and Demeshok, W.: Hemochromatosis with megaloblastic anemia responding to folic acid. *New Eng. J. Med.* 258:586-589, 1958.
32. Grossberg, S.J.: Hemochromatosis and heart failure: Presentation of a case with survival after three years' treatment by repeated venesection. *Ann. Int. Med.* 54:550-559, 1961.

Genetics

33. Dillingham, C.H.: Familial occurrence of hemochromatosis. Report of four cases in siblings. *New Eng. J. Med.* 262:1128-30, 1960.
34. Bothwell, T.H., Cohen, I., Abrahams, O.L. and Perold, S.M.: A familial study in idiopathic hemochromatosis. *Am. J. Med.* 27:730-738, 1959.
35. Brick, I.B.: Liver histology in six asymptomatic siblings in a family with hemochromatosis; genetic implications. *Gastroenterology* 40:210-214, 1961.

Experimental

36. Brown, E.B., Jr., Dubach, R., Smith, D.E., Reynafarje, C. and Moore, C.V.: Studies on iron transportation and metabolism. X. Long-term iron overload in dogs. *J. Lab. & Clin. Med.* 50:86-893, 1957.
37. Goldberg, L. and Smith, J.P.: Iron overloading and hepatic vulnerability. *Am. J. Path.* 36:125-145, 1960.
38. MacDonald, R.A.: Experimental pigment cirrhosis. Its production in rats by feeding a choline-deficient diet with excess iron. *Am. J. Path.* 36:499-520, 1960.

Therapy

39. Davis, W.D., Jr., and Arrowsmith, W.R.: The effect of repeated phlebotomies in hemochromatosis. Report of three cases. *J. Lab. & Clin. Med.* 39:526-532, 1952.
40. Finch, S.C. and Barnett, R.N.: Diagnostic and therapeutic phlebotomy in hemochromatosis with anemia. *New Eng. J. Med.* 256:884-887, 1957.
41. Crosby, W.H.: Treatment of haemochromatosis by energetic phlebotomy. One patient's response to the letting of 55 liters of blood in 11 months. *Brit. J. Haemat.* 4:82, 1958.
42. Ley, A.B.: The management of hemochromatosis. *Med. Clin. N. Amer.* 44:789-799, 1960 (May).
43. Harby, G., Wasi, P. and Block, M.: Significance of the distribution and cytology of iron in primary hemochromatosis during treatment with phlebotomies. *J. Clin. Invest.* 39:994, 1960 (Abstract).
44. Fahey, J.L., Rath, C.E., Princutto, J.V., Brick, I.B., and Rubin, M.: Evaluation of trisodium calcium diethylenetriaminepentaacetate in iron storage disease. *J. Lab. & Clin. Med.* 57:436-449, 1961.