

Chapter 151

Diabetes Mellitus and Other Endocrine Diseases

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REFERENCES

- Centers for Disease Control National Diabetes Fact Sheet. General information and national estimates on diabetes in the United States. In, Atlanta: Centers for Disease Control and Prevention, US Dept of Health and Human Services, 2007
- Hogan P, Dall T, Nikolov P: Economic costs of diabetes in the US in 2002. *Diabetes Care* **26**:917, 2003
- Narayan KM et al: Lifetime risk for diabetes mellitus in the United States. *Jama* **290**:1884, 2003
- Holman RR et al: 10-year follow-up of intensive glucose control in type 2 diabetes. *N Engl J Med* **359**:1577, 2008
- Skyler JS et al: Intensive glycemic control and the prevention of cardiovascular events: Implications of the ACCORD, ADVANCE, and VA diabetes trials: A position statement of the American Diabetes Association and a scientific statement of the American College of Cardiology Foundation and the American Heart Association. *Diabetes Care* **32**:187, 2009
- Beisswenger PJ, Moore LL, Curphey TJ: Relationship between glycemic control and collagen-linked advanced glycosylation end products in type I diabetes. *Diabetes Care* **16**:689, 1993
- Dyer DG et al: Accumulation of Maillard reaction products in skin collagen in diabetes and aging. *J Clin Invest* **91**:2463, 1993
- Buckingham BA et al: Scleroderma-like changes in insulin-dependent diabetes mellitus: Clinical and biochemical studies. *Diabetes Care* **7**:163, 1984
- Monnier VM et al: Skin collagen glycation, glycoxidation, and crosslinking are lower in subjects with long-term intensive versus conventional therapy of type 1 diabetes: Relevance of glycated collagen products versus HbA1c as markers of diabetic complications. DCCT Skin Collagen Ancillary Study Group. Diabetes Control and Complications Trial. *Diabetes* **48**:870, 1999
- Olerud JE: *Ellenburg & Rifkin's Diabetes Mellitus*. New York, McGraw-Hill, 895-908, 2003
- Joshi N et al: Infections in patients with diabetes mellitus. *N Engl J Med* **341**:1906, 1999
- Cruz PD Jr, Hud JA Jr: Excess insulin binding to insulin-like growth factor receptors: Proposed mechanism for acanthosis nigricans. *J Invest Dermatol* **98**:825, 1992
- Brunzell JD, Porte D Jr, Bierman EL: Abnormal lipoprotein-lipase-mediated plasma triglyceride removal in untreated diabetes mellitus associated with hypertriglyceridemia. *Metabolism* **28**:901, 1979
- Ansel JC et al: Interactions of the skin and nervous system. *J Invest Dermatol Symp Proc* **2**:23, 1997
- Reiber GE, Pecoraro RE, Koepsell TD: Risk factors for amputation in patients with diabetes mellitus. A case-control study. *Ann Intern Med* **117**:97, 1992
- Schwartz RA: Acanthosis nigricans. *J Am Acad Dermatol* **31**:1, 1994
- Stuart CA, Pate CJ, Peters EJ: Prevalence of acanthosis nigricans in an unselected population. *Am J Med* **87**:269, 1989
- Tasjian D, Jarratt M: Familial acanthosis nigricans. *Arch Dermatol* **120**:1351, 1984
- Stuart CA et al: Acanthosis nigricans as a risk factor for non-insulin dependent diabetes mellitus. *Clin Pediatr (Phila)* **37**:73, 1998
- Andreev V: Malignant acanthosis nigricans. *Seminars in Dermatology* **3**:265, 1984
- Dunaif A: Insulin resistance and the polycystic ovary syndrome: mechanism and implications for pathogenesis. *Endocr Rev* **18**:774, 1997
- Torley D, Bellus GA, Munro CS: Genes, growth factors and acanthosis nigricans. *Br J Dermatol* **147**:1096, 2002
- Flier JS, Usher P, Moses AC: Monoclonal antibody to the type I insulin-like growth factor (IGF-I) receptor blocks IGF-I receptor-mediated DNA synthesis: clarification of the mitogenic mechanisms of IGF-I and insulin in human skin fibroblasts. *Proc Natl Acad Sci U S A* **83**:664, 1986

24. Ellis DL et al: Melanoma, growth factors, acanthosis nigricans, the sign of Leser-Trelat, and multiple acrochordons. A possible role for alpha-transforming growth factor in cutaneous paraneoplastic syndromes. *N Engl J Med* **317**:1582, 1987
25. Koyama S et al: Transforming growth factor-alpha (TGF alpha)-producing gastric carcinoma with acanthosis nigricans: an endocrine effect of TGF alpha in the pathogenesis of cutaneous paraneoplastic syndrome and epithelial hyperplasia of the esophagus. *J Gastroenterol* **32**:71, 1997
26. Brown J, Winkelmann RK: Acanthosis nigricans: a study of 90 cases. *Medicine (Baltimore)* **47**:33, 1968
27. *Lever's histopathology of the skin*. 8th edition. Philadelphia: Lippincott Williams and Wilkins, 393-396, 1997
28. Bohm M, Luger TA, Metze D: Treatment of mixed-type acanthosis nigricans with topical calcipotriol. *Br J Dermatol* **139**:932, 1998
29. Blobstein SH: Topical therapy with tretinoin and ammonium lactate for acanthosis nigricans associated with obesity. *Cutis* **71**:33, 2003
30. Coates P, Shuttleworth D, Rees A: Resolution of nicotinic acid-induced acanthosis nigricans by substitution of an analogue (acipimox) in a patient with type V hyperlipidaemia. *Br J Dermatol* **126**:412, 1992
31. Kebria MM et al: Malignant acanthosis nigricans, tripe palms and the sign of Leser-Tre'lat, a hint to the diagnosis of early stage ovarian cancer: A case report and review of the literature. *Gynecol Oncol* **101**:353, 2006
32. Frost D, Beischer W: Limited joint mobility in type 1 diabetic patients: Associations with microangiopathy and subclinical macroangiopathy are different in men and women. *Diabetes Care* **24**:95, 2001
33. Silverstein JH et al: Long-term glycemic control influences the onset of limited joint mobility in type 1 diabetes. *J Pediatr* **132**:944, 1998
34. Rosenbloom AL et al: Limited joint mobility in childhood diabetes mellitus indicates increased risk for microvascular disease. *N Engl J Med* **305**:191, 1981
35. Infante JR et al: Changes in frequency and severity of limited joint mobility in children with type 1 diabetes mellitus between 1976-78 and 1998. *J Pediatr* **138**:33, 2001
36. Buckingham B et al: Skin, joint, and pulmonary changes in type I diabetes mellitus. *Am J Dis Child* **140**:420, 1986
37. Fleischmajer R, Faludi G, Krol S: Scleredema and diabetes mellitus. *Arch Dermatol* **101**:21, 1970
38. Cohn BA, Wheeler CE Jr, Briggaman RA: Scleredema adutorum of Buschke and diabetes mellitus. *Arch Dermatol* **101**:27, 1970
39. Cole GW, Headley J, Skowsky R: Scleredema diabeticorum: A common and distinct cutaneous manifestation of diabetes mellitus. *Diabetes Care* **6**:189, 1983
40. Sattar MA et al: Scleroedema diabeticorum: A minor but often unrecognized complication of diabetes mellitus. *Diabet Med* **5**:465, 1988
41. Varga J et al: Scleredema adutorum: Case report and demonstration of abnormal expression of extracellular matrix genes in skin fibroblasts in vivo and in vitro. *Br J Dermatol* **132**:992, 1995
42. Seyger MM et al: A patient with a severe scleroedema diabeticorum, partially responding to low-dose methotrexate. *Dermatology* **198**:177, 1999
43. Lee MW et al: Electron beam therapy in patients with scleredema. *Acta Derm Venereol* **80**:307, 2000
44. Parker F et al: Evidence for the chylomicron origin of lipids accumulating in diabetic eruptive xanthomas: A correlative lipid biochemical, histochemical, and electron microscopic study. *J Clin Invest* **49**:2172, 1970
45. Bagdade JD, Porte D Jr, Bierman EL: Diabetic lipemia. A form of acquired fat-induced lipemia. *N Engl J Med* **276**:427, 1967
46. Chait A, Robertson HT, Brunzell JD: Chylomicronemia syndrome in diabetes mellitus. *Diabetes Care* **4**:343, 1981
47. Parker F: Xanthomas and hyperlipidemias. *J Am Acad Dermatol* **13**:1, 1985
48. Valerius NH et al: Neutrophil and lymphocyte function in patients with diabetes mellitus. *Acta Med Scand* **211**:463, 1982
49. Gallacher SJ et al: Neutrophil bactericidal function in diabetes mellitus: Evidence for association with blood glucose control. *Diabet Med* **12**:916, 1995
50. Singh N, Armstrong DG, Lipsky BA: Preventing foot ulcers in patients with diabetes. *Jama* **293**:217, 2005
51. Pecoraro RE, Reiber GE, Burgess EM: Pathways to diabetic limb amputation. Basis for prevention. *Diabetes Care* **13**:513, 1990
52. Consensus Development Conference on Diabetic Foot Wound Care: 7-8 April 1999, Boston, Massachusetts. American Diabetes Association. *Diabetes Care* **22**:1354-1360, 1999

53. Ramsey SD et al: Incidence, outcomes, and cost of foot ulcers in patients with diabetes. *Diabetes Care* **22**:382, 1999
54. Levy DM et al: Depletion of cutaneous nerves and neuropeptides in diabetes mellitus: An immunocytochemical study. *Diabetologia* **32**:427, 1989
55. Antezana M et al: Neutral endopeptidase activity is increased in the skin of subjects with diabetic ulcers. *J Invest Dermatol* **119**:1400, 2002
56. Apelqvist J, Larsson J, Agardh CD: The influence of external precipitating factors and peripheral neuropathy on the development and outcome of diabetic foot ulcers. *J Diabet Complications* **4**:21, 1990
57. Soulier SM: The use of running shoes in the prevention of plantar diabetic ulcers. *J Am Podiatr Med Assoc* **76**:395, 1986
58. Boyko EJ et al: Prediction of diabetic foot ulcer occurrence using commonly available clinical information: The Seattle Diabetic Foot Study. *Diabetes Care* **29**:1202, 2006
59. Wieman TJ, Smiell JM, Su Y: Efficacy and safety of a topical gel formulation of recombinant human platelet-derived growth factor-BB (becaplermin) in patients with chronic neuropathic diabetic ulcers. A phase III randomized placebo-controlled double-blind study. *Diabetes Care* **21**:822, 1998
60. Edmonds M et al: New treatments in ulcer healing and wound infection. *Diabetes Metab Res Rev* **16**(Suppl 1):S51, 2000
61. Langer A, Rogowski W: Systematic review of economic evaluations of human cell-derived wound care products for the treatment of venous leg and diabetic foot ulcers. *BMC Health Serv Res* **9**:115, 2009
62. Van Gils CC et al: Amputation prevention by vascular surgery and podiatry collaboration in high-risk diabetic and nondiabetic patients. The Operation Desert Foot experience. *Diabetes Care* **22**:678, 1999
63. Muller SA, Winkelmann RK: Necrobiosis lipoidica diabetorum. A clinical and pathological investigation of 171 cases. *Arch Dermatol* **93**:272, 1966
64. O'Toole EA et al: Necrobiosis lipoidica: Only a minority of patients have diabetes mellitus. *Br J Dermatol* **140**:283, 1999
65. Lowitt MH, Dover JS: Necrobiosis lipoidica. *J Am Acad Dermatol* **25**:735, 1991
66. Dandona P et al: Glycosylated haemoglobin in patients with necrobiosis lipoidica and granuloma annulare. *Clin Exp Dermatol* **6**:299, 1981
67. Mann RJ, Harman RR: Cutaneous anaesthesia in necrobiosis lipoidica. *Br J Dermatol* **110**:323, 1984
68. Imtiaz KE, Khaleeli AA: Squamous cell carcinoma developing in necrobiosis lipoidica. *Diabet Med* **18**:325, 2001
69. Crosby DL, Woodley DT, Leonard DD: Concomitant granuloma annulare and necrobiosis lipoidica. Report of a case and review of the literature. *Dermatologica* **183**:225, 1991
70. Petzelbauer P, Wolff K, Tappeiner G: Necrobiosis lipoidica: Treatment with systemic corticosteroids. *Br J Dermatol* **126**:542, 1992
71. Kreuter A et al: Fumaric acid esters in necrobiosis lipoidica: Results of a prospective noncontrolled study. *Br J Dermatol* **153**:802, 2005
72. Darvay A, Acland KM, Russell-Jones R: Persistent ulcerated necrobiosis lipoidica responding to treatment with cyclosporin. *Br J Dermatol* **141**:725, 1999
73. Dubin BJ, Kaplan EN: The surgical treatment of necrobiosis lipoidica diabetorum. *Plast Reconstr Surg* **60**:421, 1977
74. Dabski K, Winkelmann RK: Generalized granuloma annulare: Clinical and laboratory findings in 100 patients. *J Am Acad Dermatol* **20**:39, 1989
75. Veraldi S et al: Laboratory abnormalities in granuloma annulare: A case-control study. *Br J Dermatol* **136**:652, 1997
76. Melin H: An atrophic circumscribed skin lesion in the lower extremities of diabetics. *Acta Med Scand* **176**(Suppl 423):1, 1964
77. Binkley GW: Dermopathy in diabetes mellitus. *Arch Dermatol* **92**:106, 1965
78. Borsen B, Bergenheim T, Lithner F: The epidemiology of foot lesions in diabetic patients aged 15–50 years. *Diabet Med* **7**:438, 1990
79. Danowski TS et al: Shin spots and diabetes mellitus. *Am J Med Sci* **251**:570, 1966
80. Lithner F: Cutaneous reactions of the extremities of diabetics to local thermal trauma. *Acta Med Scand* **198**:319, 1975
81. Shemer A et al: Diabetic dermopathy and internal complications in diabetes mellitus. *Int J Dermatol* **37**:113, 1998
82. Rapini RP et al: Acquired perforating dermatosis. Evidence for combined transepidermal elimination of both collagen and elastic fibers. *Arch Dermatol* **125**:1074, 1989

83. Faver IR, Daoud MS, Su WP: Acquired reactive perforating collagenosis. Report of six cases and review of the literature. *J Am Acad Dermatol* 30:575, 1994
84. Bernstein JE et al: Reduced threshold to suction-induced blister formation in insulin-dependent diabetics. *J Am Acad Dermatol* 8:790, 1983
85. Toonstra J: Bullosis diabetorum. Report of a case with a review of the literature. *J Am Acad Dermatol* 13:799, 1985
86. Ogden CL et al: Prevalence of overweight and obesity in the United States, 1999–2004. *Jama* 295:1549, 2006
87. Kelesidis T et al: Narrative review: The role of leptin in human physiology: Emerging clinical applications. *Ann Intern Med* 152:93, 2010
88. Oral EA et al: Leptin-replacement therapy for lipodystrophy. *N Engl J Med* 346:570, 2002
89. Lee JH et al: Recombinant methionyl human leptin therapy in replacement doses improves insulin resistance and metabolic profile in patients with lipoatrophy and metabolic syndrome induced by the highly active antiretroviral therapy. *J Clin Endocrinol Metab* 91:2605, 2006
90. Schaffer JV, Bolognia JL: The melanocortin-1 receptor: Red hair and beyond. *Arch Dermatol* 137:1477, 2001
91. Krude H et al: Severe early-onset obesity, adrenal insufficiency and red hair pigmentation caused by POMC mutations in humans. *Nat Genet* 19:155, 1998
92. Katsuki A et al: Plasma levels of agouti-related protein are increased in obese men. *J Clin Endocrinol Metab* 86:1921, 2001
93. Sonnett TE et al: Diabetes mellitus, inflammation, obesity: Proposed treatment pathways for current and future therapies. *Ann Pharmacother* 44:701, 2010
94. Inui A et al: Ghrelin, appetite, and gastric motility: The emerging role of the stomach as an endocrine organ. *Faseb J* 18:439, 2004
95. Loffler H, Aramaki JU, Effendy I: The influence of body mass index on skin susceptibility to sodium lauryl sulphate. *Skin Res Technol* 8:19, 2002
96. Guida B et al: The impact of obesity on skin disease and epidermal permeability barrier status. *J Eur Acad Dermatol Venereol* 24:191, 2010
97. Yosipovitch G et al: Skin surface pH in intertriginous areas in NIDDM patients. Possible correlation to candidal intertrigo. *Diabetes Care* 16:560, 1993
98. Enser M, Avery NC: Mechanical and chemical properties of the skin and its collagen from lean and obese-hyperglycaemic (ob/ob) mice. *Diabetologia* 27:44, 1984
99. de Jongh RT et al: Impaired local microvascular vasodilatory effects of insulin and reduced skin microvascular vasomotion in obese women. *Microvasc Res* 75:256, 2008
100. Yosipovitch G, DeVore A, Dawn A: Obesity and the skin: Skin physiology and skin manifestations of obesity. *J Am Acad Dermatol* 56:901, 2007
101. Scheinfeld NS: Obesity and dermatology. *Clin Dermatol* 22:303, 2004
102. Klein S et al: Absence of an effect of liposuction on insulin action and risk factors for coronary heart disease. *N Engl J Med* 350:2549, 2004
103. Mohammed BS et al: Long-term effects of large-volume liposuction on metabolic risk factors for coronary heart disease. *Obesity (Silver Spring)* 16:2648, 2008
104. Hollowell JG et al: Serum TSH, T(4), and thyroid antibodies in the United States population (1988 to 1994): National Health and Nutrition Examination Survey (NHANES III). *J Clin Endocrinol Metab* 87:489, 2002
105. Weetman AP: Graves' disease. *N Engl J Med* 343:1236, 2000
106. Laurberg P et al: High incidence of multinodular toxic goitre in the elderly population in a low iodine intake area vs. high incidence of Graves' disease in the young in a high iodine intake area: Comparative surveys of thyrotoxicosis epidemiology in East-Jutland Denmark and Iceland. *J Intern Med* 229:415, 1991
107. Buyukgebiz A: Congenital hypothyroidism clinical aspects and late consequences. *Pediatr Endocrinol Rev* 1(Suppl 2):185, 2003
108. Polak M: Hyperthyroidism in early infancy: Pathogenesis, clinical features and diagnosis with a focus on neonatal hyperthyroidism. *Thyroid* 8:1171, 1998
109. Brent GA: The molecular basis of thyroid hormone action. *N Engl J Med* 331:847, 1994
110. Rees Smith B, McLachlan SM, Furmaniak J: Auto-antibodies to the thyrotropin receptor. *Endocr Rev* 9:106, 1988
111. Surks MI, Sievert R: Drugs and thyroid function. *N Engl J Med* 333:1688, 1995
112. Prabhakar BS, Bahn RS, Smith TJ: Current perspective on the pathogenesis of Graves' disease and ophthalmopathy. *Endocr Rev* 24:802, 2003

113. Derwahl M et al: Pathogenesis of toxic thyroid adenomas and nodules: Relevance of activating mutations in the TSH-receptor and Gs-alpha gene, the possible role of iodine deficiency and secondary and TSH-independent molecular mechanisms. *Exp Clin Endocrinol Diabetes* **106**(Suppl 4):S6, 1998
114. Safer JD, Crawford TM, Holick MF: Topical thyroid hormone accelerates wound healing in mice. *Endocrinology* **146**:4425, 2005
115. Sherman SI et al: Central hypothyroidism associated with retinoid X receptor-selective ligands. *N Engl J Med* **340**:1075, 1999
116. Ai J, Leonhardt JM, Heymann WR: Autoimmune thyroid diseases: Etiology, pathogenesis, and dermatologic manifestations. *J Am Acad Dermatol* **48**:641, 2003
117. Fatourehchi V, Pajouhi M, Fransway AF: Dermopathy of Graves disease (pretibial myxedema). Review of 150 cases. *Medicine (Baltimore)* **73**:1, 1994
118. Parker LN et al: The early diagnosis of atypical thyroid acropachy. *Arch Intern Med* **142**:1749, 1982
119. Fatourehchi V, Ahmed DD, Schwartz KM: Thyroid acropachy: Report of 40 patients treated at a single institution in a 26-year period. *J Clin Endocrinol Metab* **87**:5435, 2002
120. Dreskin SC, Andrews KY: The thyroid and urticaria. *Curr Opin Allergy Clin Immunol* **5**:408, 2005
121. Biro E et al: Association of systemic and thyroid autoimmune diseases. *Clin Rheumatol* **25**:240, 2006
122. Callen JP, McCall MW: Bullous pemphigoid and Hashimoto's thyroiditis. *J Am Acad Dermatol* **5**:558, 1981
123. Coleman R, Hay RJ: Chronic mucocutaneous candidosis associated with hypothyroidism: A distinct syndrome? *Br J Dermatol* **136**:24, 1997
124. Puavilai S et al: Prevalence of thyroid diseases in patients with alopecia areata. *Int J Dermatol* **33**:632, 1994
125. Zettinig G et al: Dermatitis herpetiformis is associated with atrophic but not with goitrous variant of Hashimoto's thyroiditis. *Eur J Clin Invest* **30**:53, 2000
126. Schwartz KM et al: Dermopathy of Graves' disease (pretibial myxedema): Long-term outcome. *J Clin Endocrinol Metab* **87**:438, 2002
127. Pingsmann A, Ockenfels HM, Patsalis T: Surgical excision of pseudotumorous pretibial myxedema. *Foot Ankle Int* **17**:107, 1996
128. Wermers RA et al: Incidence of primary hyperparathyroidism in Rochester, Minnesota, 1993–2001: An update on the changing epidemiology of the disease. *J Bone Miner Res* **21**:171, 2006
129. Foley J et al: PTHrP regulates epidermal differentiation in adult mice. *J Invest Dermatol* **111**:1122, 1998
130. Sharpe GR et al: Human keratinocytes express transcripts for three isoforms of parathyroid hormone-related protein (PTHrP), but not for the parathyroid hormone/PTHrP receptor: Effects of 1,25(OH)₂ vitamin D₃. *Br J Dermatol* **138**:944, 1998
131. Lowik CW et al: Regulation of parathyroid hormone-like protein production in cultured normal and malignant keratinocytes. *J Invest Dermatol* **98**:198, 1992
132. Atillasoy EJ, Burtis WJ, Milstone LM: Immunohistochemical localization of parathyroid hormone-related protein (PTHrP) in normal human skin. *J Invest Dermatol* **96**:277, 1991
133. Blomme EA et al: Spatial and temporal expression of parathyroid hormone-related protein during wound healing. *J Invest Dermatol* **112**:788, 1999
134. Danks JA et al: Parathyroid hormone-related protein: Immunohistochemical localization in cancers and in normal skin. *J Bone Miner Res* **4**:273, 1989
135. Walsh JS, Fairley JA: Calcifying disorders of the skin. *J Am Acad Dermatol* **33**:693, 1995
136. Dagher HN, Aboujaoude ZC, Jabbour SA: Chronic urticaria: An unusual initial manifestation of primary hyperparathyroidism. *Endocr Pract* **8**:47, 2002
137. Heppner C et al: Somatic mutation of the MEN1 gene in parathyroid tumours. *Nat Genet* **16**:375, 1997
138. Basile C et al: Hyperbaric oxygen therapy for calcific uremic arteriopathy: A case series. *J Nephrol* **15**:676, 2002
139. Podymow T, Wherrett C, Burns KD: Hyperbaric oxygen in the treatment of calciphylaxis: A case series. *Nephrol Dial Transplant* **16**:2176, 2001
140. Schlieper G et al: Sodium thiosulfate in the treatment of calcific uremic arteriopathy. *Nat Rev Nephrol* **5**:539, 2009
141. Lee Y et al: Hypocalcaemia-induced pustular psoriasis-like skin eruption. *Br J Dermatol* **152**:591, 2005

142. Makitie O et al: Bone health in autoimmune polyendocrinopathy-candidiasis-ectodermal dystrophy (APECED): Findings in 25 adults. *Clin Endocrinol (Oxf)* **64**:489, 2006
143. Wilson LC, Hall CM: Albright's hereditary osteodystrophy and pseudohypoparathyroidism. *Semin Musculoskelet Radiol* **6**:273, 2002
144. Beauregard C, Dickstein G, Lacroix A: Classic and recent etiologies of Cushing's syndrome: Diagnosis and therapy. *Treat Endocrinol* **1**:79, 2002
145. Ilias I et al: Cushing's syndrome due to ectopic corticotropin secretion: Twenty years' experience at the National Institutes of Health. *J Clin Endocrinol Metab* **90**:4955, 2005
146. Kirk JM et al: Cushing's syndrome caused by nodular adrenal hyperplasia in children with McCune-Albright syndrome. *J Pediatr* **134**:789, 1999
147. Groussin L et al: Adrenal pathophysiology: Lessons from the Carney complex. *Horm Res* **64**:132, 2005
148. Orth DN: Cushing's syndrome. *N Engl J Med* **332**:791, 1995
149. Becker KL: *Principles and Practice of Endocrinology and Metabolism*. Philadelphia: Lippincott Williams and Wilkins, 726-729, 2001
150. Cohen KL, Noth RH, Pechinski T: Incidence of pituitary tumors following adrenalectomy. A long-term follow-up study of patients treated for Cushing's disease. *Arch Intern Med* **138**:575, 1978
151. Ten S, New M, Maclaren N: Clinical review 130: Addison's disease 2001. *J Clin Endocrinol Metab* **86**:2909, 2001
152. Alevritis EM et al: Infectious causes of adrenal insufficiency. *South Med J* **96**:888, 2003
153. Zelissen PM, Bast EJ, Croughs RJ: Associated autoimmunity in Addison's disease. *J Autoimmun* **8**:121, 1995
154. Barkan A, Glantz I: Calcification of auricular cartilages in patients with hypopituitarism. *J Clin Endocrinol Metab* **55**:354, 1982
155. Bensyl DM et al: Contraceptive use—United States and territories, Behavioral Risk Factor Surveillance System, 2002. *MMWR Surveill Summ* **54**:1, 2005
156. Farage MA, Berardesca E, Maibach H: The possible relevance of sex hormones on irritant and allergic responses: Their importance for skin testing. *Contact Dermatitis* **62**:67, 2010
157. Hall G, Phillips TJ: Estrogen and skin: the effects of estrogen, menopause, and hormone replacement therapy on the skin. *J Am Acad Dermatol* **53**:555, 2005
158. Sarkar R et al: Melasma in men: A clinical, aetiological and histological study. *J Eur Acad Dermatol Venereol* **24**: 768-772, 2009
159. Shelley WB et al: Estrogen dermatitis. *J Am Acad Dermatol* **32**:25, 1995
160. Rendon M et al: Treatment of melasma. *J Am Acad Dermatol* **54**:S272, 2006
161. Petri M et al: Combined oral contraceptives in women with systemic lupus erythematosus. *N Engl J Med* **353**:2550, 2005
162. Buyon JP et al: The effect of combined estrogen and progesterone hormone replacement therapy on disease activity in systemic lupus erythematosus: A randomized trial. *Ann Intern Med* **142**:953, 2005
163. Lee H: CYP21 mutations and congenital adrenal hyperplasia. *Clin Genet* **59**:293, 2001
164. Chen W, Thiboutot D, Zouboulis CC: Cutaneous androgen metabolism: Basic research and clinical perspectives. *J Invest Dermatol* **119**:992, 2002
165. Wilt TJ et al: Five-alpha-reductase inhibitors for prostate cancer prevention. *Cochrane Database Syst Rev* **16**: CD007091, 2008
166. Price VH et al: Lack of efficacy of finasteride in postmenopausal women with androgenetic alopecia. *J Am Acad Dermatol* **43**:768, 2000
167. Thiboutot D: Acne: Hormonal concepts and therapy. *Clin Dermatol* **22**:419, 2004
168. Kojima M et al: Ghrelin is a growth-hormone-releasing acylated peptide from stomach. *Nature* **402**:656, 1999
169. Takaya K et al: Ghrelin strongly stimulates growth hormone release in humans. *J Clin Endocrinol Metab* **85**:4908, 2000
170. Alexander L et al: Epidemiology of acromegaly in the Newcastle region. *Clin Endocrinol (Oxf)* **12**:71, 1980
171. Melmed S: Acromegaly. *N Engl J Med* **322**:966, 1990
172. Stratakis CA et al: Carney complex, a familial multiple neoplasia and lentiginosis syndrome. Analysis of 11 kindreds and linkage to the short arm of chromosome 2. *J Clin Invest* **97**:699, 1996
173. Nabarro JD: Acromegaly. *Clin Endocrinol (Oxf)* **26**:481, 1987
174. Melmed S: Medical progress: Acromegaly. *N Engl J Med* **355**:2558, 2006
175. Melmed S et al: Guidelines for acromegaly management. *J Clin Endocrinol Metab* **87**:4054, 2002

176. Molitch ME et al: Evaluation and treatment of adult growth hormone deficiency: N endocrine society clinical practice guideline. *J Clin Endocrinol Metab* **91**:1621, 2006

