7 EXTREME WEIGHT LOSS IN THE ADOLESCENT ATHLETE: MISGUIDED DIETING OR A MASK OF ANOREXIA NERVOSA. J.J. Chipman, J.C. Edlin, R.D. Hagan, B.R. Carruth, M. Sol, H.F. Eichenwald. Univ. of Tx. Health Sci. Ctr. at Dallas, Institute for Aerobic Research, Dallas.

"Food aversion in athletes simulating anorexia nervosa" has been described recently. However, psychologic, endocrine and physiologic parameters which differentiate athletes with "food aversion" from those with 1^o anorexia nervosa are poorly defined. We investigated the psychological, endocrine and aerobic function in a late pubertal male with excessive weight loss. A 14.5 y/o male, Tanner Stage IVg, presented with weight loss reaching a nadir of -23% of ideal body weight (total body fat=1.25% by hydrostatic weighing and skinfold determinations). He withdrew from competitive football and extended jogging efforts to 8 km·day⁻¹. Purposeful weight loss was due to misinterpretation of a diet for runners. Psychiatric evaluation revealed a disturbed body image and distorted attitudes toward eating. Hypothalamic dysfunction was confirmed by q20m blood sampling over 24 h. The 24 h mean LH=4.9 mIU/ml and mean testosterone=27.1 ng/dl. Aerobic performance was also abnormal. Resting HR=38 bpm. Bruce treadmill test: performance time=13.0 min (nl for age, 14.1 min) and maximal HR=165 bpm (nl=196 bpm). Maximal $\dot{V}O_2=3.09$ l·min⁻¹ (nl=3.7±0.3 l·min⁻¹). Correction of the above abnormalities was documented during weight gain. We conclude, athletes with excessive weight loss 1) should have psychiatric and aerobic performance monitoring 2) may have hypothalamic dysfunction (a nondiagnostic result) and 3) may have altered aerobic performance - recognized best by bradycardia during maximal exertion.

8 DESYNCHRONIZATION OF LUTEINIZING HORMONE (LH) FROM SLEEP IN ADOLESCENTS WITH POLYCYSTIC OVARY SYNDROME (PCOS).

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PCOS is associated with disordered ovulation, absence of monthly LH surge, and elevated plasma LH. At puberty, the diurnal rhythm of LH secretion normally undergoes a complex ontogeny during which time ovulation begins and becomes cyclic. This study was undertaken to determine if a disturbance in the diurnal rhythm of LH secretion could be defined in adolescents with PCOS. 24 hour profiles of LH secretion were determined in 8 adolescents (age 13-19) with PCOS by measuring plasma LH every 20 minutes and sleep with polygraphic monitoring. Criteria for PCOS included presence of cystic ovaries by laparoscopy or ultrasonography, normal estrogenization, oligoamenorrhea, normal urinary 17-hydroxycorticosteroids and pregnanetriol, minimal or no elevation of urinary 17-ketosteroids, normal thyroid function and no hormonal therapy or other illness. 2 of 8 adolescents (age 13&15) showed a marked LH surge beginning 1-2 hours after awakening and lasting 7-8 hours. This surge was similar to the normal sleep-associated LH rise in mid-pubertal girls except desynchronized from sleep by 8-9 hours. The other 6 adolescents had no marked diurnal variation in LH secretion. 24 hour mean plasma LH levels were elevated in patients with abnormal diurnal variation (38.63 mIU/ml) and in all but one of the others (11, 23, 25, 33, 38, 52 mIU/ml). This study identifies a subgroup of adolescents with PCOS with pubertal LH surges desynchronized from sleep and suggests the possibility of a chronobiological disturbance as an etiologic factor in PCOS.

9 LINEAR GROWTH DURING PUBERTY: IMPACT OF PUBERTAL DEVELOPMENT. Paula M. Duke, J. Merrill Carlsmith, Dennis Jennings, John A. Martin, Sanford M. Dornbusch, Ruth T. Gross, Stanford University School of Medicine, Departments of Pediatrics, Psychology, Sociology, Stanford, California.

Short stature is a frequent complaint of adolescent males. The pediatrician's ability to interpret this concern is largely dependent upon use of standard growth curves. These curves are based only on chronological age and do not reflect the impact of sexual maturation on height. Accordingly, we undertook to revise these curves to enhance their usefulness.

Using National Health Examination Survey data from 3,000 male adolescents, ages 12 to 17, we constructed height curves for each stage of sexual maturation and age. The resulting graphs depict estimated percentiles for height at each stage of sexual maturation from ages 12 to 17.

Applications: a 145 cm 13 year old boy with a Sex Maturity Rating (S.M.R.) of 1, is later in sexual maturation and shorter than his age mates with his height measuring below the 10th percentile on standard height charts. When compared with other S.M.R. 1, 13 year old males, his height is at almost the 25th percentile. For the 150 cm 14 year old boy with a S.M.R. of 2, his percentile moves from 5th-10th percentile on the standard growth curve to approximately the 20th percentile on the curves adjusted for stage of sexual maturation.

Our data provide pediatricians with a more precise way of evaluating adolescent male height and may offer information potentially reassuring to the short, late-maturing adolescent male and his parents.

10 TEENAGE FATHERS: STRESS TRAJECTORY THROUGH PREGNANCY. Arthur B. Elster, Susan Panzarine (spon. by Richard Siegler), University of Utah Medical Center, Dept. of Pediatrics, Salt Lake City, Utah.

Previous work by the investigators demonstrated that some teenage fathers may have difficulty coping with the stresses surrounding pregnancy. The purpose of the present study was to investigate the trajectory of these stresses. Twenty prospective fathers (age range 17-18), were interviewed on an average of 1.5 times during gestation: 4 during 1st trimester (mean=12 wks.), 10 during 2nd trimester (mean=22.5 wks.), and 15 during 3rd trimester (mean=32.5 wks.). All pregnancies were conceived premaritally; 14 teens were married at 1st interview. Using a semi-structured technique, subjects were questioned as to the type of stresses felt at the present time, and during each of the previous trimester intervals. The degree of each stress was rated from 1 (low) to 3 (high). A stress magnitude score was determined by a formula utilizing relative frequency and degree of each stress. The combined magnitude scores for each trimester were 6.05 (1st), 7.02 (2nd), 8.20 (3rd). Stresses were combined into 6 categories. Between 1st and 3rd trimester, concerns regarding mother/child health, vocation-education (predominantly financial), and relationships rose in magnitude, while stresses resulting from the circumstances of pregnancy (predominantly negative responses from parents) declined in magnitude. Concerns of parenthood increased between 1st and 2nd trimester and remained at that level, while miscellaneous concerns rose and then fell. These results demonstrate that the degree and nature of stresses affecting teen fathers change thru gestation.

11 RACE-SPECIFIC PATTERNS OF ABORTION UTILIZATION BY AMERICAN TEENAGERS, 1972-78. Nancy V. Ezzard, Willard Cates, Jr., Centers for Disease Control, Atlanta, Ga., Christopher Tietze, The Population Council, New York. (Spon. by Roger A. Feldman).

Did the nationally increased availability of legal abortion (AB) in 1973 lead to changes in racial patterns of abortion utilization by American teenagers? To obtain nationally representative AB rates (AB/1000 women of a given age) and AB ratios (AB/1000 live births to women of a given age), we used age and race distributions of AB reported annually to the Centers for Disease Control for 1972-78. The univariate totals for teens (age x AB and race x AB) were converted to bivariate distributions (age x race x AB) using iterative adjustment with two reference populations. The AB rate for nonwhite teens increased from 18.1 in 1972 to 54.2 in 1978 (+199%) while that of white teens rose from 11.9 to 23.9 (+101%). During these seven years the relative rank of AB rates remained the same for teens of all age subgroups (<15, 15-17, 18-19 years). The AB ratio for nonwhite teens increased from 188.6 in 1972 to 663.7 in 1978 (+252%) while that of white teens increased from 278.7 to 618.9 (+122%). In contrast to AB rates, relative rankings of AB ratios changed. In 1972, nonwhite teens of all age subgroups had lower AB ratios than white teens of corresponding ages. In 1978, the two youngest groups (<15, 15-17) had approximately equal AB ratios while the AB ratio of the oldest nonwhite teens (18-19) was 18% higher than that of the oldest white teens (708.3 vs. 600.1). Thus, the increased availability of legal AB services was associated with both increased use and more equal utilization of abortion by white and nonwhite teens.

12 NEUROTRANSMITTER MEDIATED RECURRENT VOMITING IN A TEENAGE GIRL. Jordan Finkelstein, Cassandra Matustik, Walter Meyer, George Bryan, Michael Ziegler & Michael Anch. Dept. of Pediatrics and Internal Medicine. University of Texas Medical Branch. Galveston, Texas.

Abdominal pain & vomiting are common complaints in adolescents. This is the third case who responded to treatment altering CNS neurotransmitters. Hyperemesis with wt. loss of 25 lbs. occurred in the first month of pregnancy. Recurrent vomiting between 1 & 9 months was diagnosed as pylorospasm & was not relieved by "drops". At 8 years vomiting started again. During 40 hospitalizations, all tests were normal. Diagnosis was psychogenic vomiting which was unresponsive to phenobarbital, phentoin or chlorpromazine. During an attack, she had vomiting, mild abdominal pain, personality change, hypertension, fever, tachycardia, WBC 10-15,000 with high hGH and abnormal EEG, all of which were normal in symptom free periods. From 13-18 years, she had 25 admissions to UTMB including 1 year on a psychiatric unit. Treatment with chlorpromazine, trifluoperazine, phenobarbital, belladonna, cyproheptadine or loxipane failed. Symptoms, lab data & response to previous therapy suggested a deficiency of CNS catechols or dopamine. Amytriptaline 150 mg/d was started to increase the concentration of these neurotransmitters in CNS. For the next 2 years she had no attacks. Studies during treatment were all normal. 3 weeks after stopping treatment, she had a typical attack. Certain cases of chronic vomiting may respond to drugs which alter CNS neurotransmitters.

13 SUSCEPTIBILITY OF URBAN ADOLESCENT OBSTETRICAL POPULATION TO RUBELLA. Sherah B. Fitzpatrick, Felix P. Heald. Univ of MD Sch of Med, Dept of Ped, Balto, MD.

Recent surveys, following the introduction of the USA rubella immunization program in 1969, have noted that 66-70% of the rubella cases are occurring in individuals 15 yrs. or older. Current estimates are that 20-30% of 10-19 yr. old females are without rubella antibody. A retrospective study was undertaken to document rubella susceptibility in an urban, low-income adolescent obstetrical population ranging in age from 12-16 yrs. Records were reviewed for all 177 patients (97% black) attending the Adol. OB Clinic from 9/73 to 10/80. Forty-six incomplete charts were excluded. Chart assessment included documentation of age; race; gestational age at first visit; rubella immunization history (as determined by prior health records, immunization cards and/or maternal history of immunizations); and rubella titers. Rubella Hemagglutination Inhibition (HI) titers were determined on a two-fold dilution method by the Univ. Serology lab; an HI antibody test of less than 1:10 or non-reactive was considered indicative of susceptibility to rubella.

Of the OB adolescent population, urban and predominantly black, 28% (34/131) were serologically susceptible to rubella. It is unclear whether the critical factor in susceptibility was the duration of vaccine-induced immunity or primary vaccine failure. To increase the level of protection in this high risk group, recommendations include: routine booster immunization with family planning for non-pregnant, seronegative adolescents and/or postpartum vaccination in seronegative teenagers.

14 EPILEPTIC ADOLESCENTS' DEVELOPING INDEPENDENCE: INFLUENCE ON ATTITUDES TOWARD THEIR PHYSICIANS.

Ira M. Friedman, John A. Martin, Iris F. Litt and Robin Henson. Stanford Univ. School Med., Dept. Ped., Stanford, Ca.

A teenager's attitudes towards his or her physician are likely to have major impact on the course of treatment and outcome in chronic disease. It has been postulated that some of these attitudes are derived from experiences with significant figures such as parents. This study was designed to test the hypothesis that teenagers' contentment with their developing independence from parents leads to positive attitudes toward their attending physicians. A longitudinal model was constructed to allow this relationship to be tested by multiple regression techniques. Satisfaction with personal freedom (SPF) granted by parents and positive or negative attitudes toward the physician (ATP) were assessed at 6-month intervals by standardized scales in a cohort of 49 epileptic patients aged 9 to 18 years. As hypothesized in the model (1) higher initial SPF was related to positive ATP 6 months later (standardized partial regression coefficient = 0.30, $p < 0.01$) and (2) initial ATP was not associated with SPF 6 months later. These relationships persisted after adjusting for the influence of a potential confounding factor, socioeconomic status. These results indicate that contentment with independence granted by parents affects the attitudes teenagers hold toward their physicians. Counseling parents to attempt to decrease conflicts over emerging independence may have positive effects on the patient-physician relationship and on compliance and outcome in chronic disease.

15 HEMATOLOGIC ABNORMALITIES IN ADOLESCENTS ON BIRTH CONTROL PILLS. Estherann Grace, S. Jean Emans, David Drum (Spon. by Warren E. Grupe). Children's Hospital Medical Center, Harvard Medical School, Boston, MA.

Because birth control pills are known to cause alterations in folate metabolism in adult women, this study's purpose was to determine if adolescents on birth control pills are at risk of developing anemia secondary to abnormal folate metabolism. 90 adolescents taking Brevicon or Norinyl 1/50 for longer than 6 months were compared to 90 non-pill users. Intake of folate was evaluated by a dietary history questionnaire. 14% of pill users and 8% of controls had low serum folates (< 3.0 ng/ml) ($p > 0.1$). Low whole blood folates (< 150 ng/ml) were seen in 32% of pill users, but in only 18% of controls. ($p < 0.1$). However, controls were more likely to have low ferritins (< 10 ng/ml) than pill users (21% v 11%; $p < 0.1$), perhaps because of diminished menstrual flow on the pill. Of the low ferritin patients two-thirds had neither low hemoglobin (< 12 g/dl) nor low MCV (< 80 um³). No low cobalamins and no significant difference was noted in the Hgb, MCV, or polylobed count in either group. This study indicates that serum folate levels, whole blood folate levels and ferritins are frequently low in adolescents and are often not reflected by CBC's. Although pill use appears to increase slightly the risk of developing cellular folate deficiency, the pill appears to be protective against iron deficiency and is not associated with anemia.

16 CHILD REARING ATTITUDES, OBSERVED BEHAVIOR, AND PERCEPTION OF INFANT TEMPERAMENT IN ADOLESCENT VERSUS OLDER MOTHERS. John W. Greene, Howard M. Sandler, Wm. A. Altemeier, III, & Susan M. O'Connor. Dept. of Peds., Vanderbilt University, Nashville, Tennessee.

Adolescent motherhood is now common but little is known about its consequences. To study this, 139 primiparous women divided by age (≤ 15 yrs.; 16 - 17 yrs.; 18 - 19 yrs.; ≥ 20 yrs.) were compared for: adaptivity of prenatal childrearing attitudes using Cohler's Maternal Attitude Scale; postnatal behavior with their infants by direct observation; perception of their infants' temperaments using Carey's Survey of Infant Characteristics. Older mothers had more adaptive attitudes on each of the five Cohler subscales. Significant differences were found in subscales for maternal attitude toward encouragement versus discouragement of reciprocity ($p = .001$), appropriate versus inappropriate closeness ($p = .01$), and acceptance versus denial of emotional complexity in child-care ($p = .05$). Postnatally, the amount of time mothers looked at and spoke to their children during interaction was measured at 1, 3, 6, 12 & 18 months; older mothers vocalized to their infants more at 3 ($p = .02$) and 6 months ($p = .04$). Carey's scale given at 1, 3, & 6 months revealed that older mothers viewed their children as having easier temperaments at 6 months ($p = .04$). These findings emphasize the need for educational and supportive services for adolescent mothers.

17 ORAL CONTRACEPTIVES IN ADOLESCENTS: LONGITUDINAL EVALUATION OF SERUM LIPIDS AND BLOOD PRESSURE. John W. Greene and Michael Artman (Sponsored by Robert C. Boerth), Dept. of Peds, Division of Adolescent Medicine, Vanderbilt University Hospital, Nashville, Tennessee.

Oral contraceptive (OC) use has been associated with multiple metabolic effects in adult women. Similar data for adolescents are incomplete, however, even though OC use is increasing among teenagers. We examined serum cholesterol (CH, mg/dl), serum triglyceride (TG, mg/dl), and blood pressure (BP) in 131 adolescents, ages 12 to 22 yrs. (mean 17.8). Initial studies were done before beginning OC's with follow-up evaluations after 6-30 months (mean 13.5) of OC use. Mean results before (BOC) and during (DOC) OC use are tabulated below.

	(n)	CH		TG		BP Syst.		BP Diast.	
		BOC	DOC	BOC	DOC	BOC	DOC	BOC	DOC
All pts.	(131)	168	176*	93	102	113	115	66	71**
Black	(74)	172	178	87	92	112	114	66	70**
White	(50)	161	176*	96	112	114	117	68	72**

* Significant at $p < 0.05$ ** Significant at $p < 0.01$
During OC use, CH increased significantly in whites, and diastolic BP increased in all groups. Systolic BP increased significantly ($p < 0.01$) only in pts. using OC's for greater than 20 months. No significant changes in TG were found. Age, weight, smoking, OC strength, and family history were unrelated to the observed changes. The increases in CH and BP found in this study are small but statistically significant. The long term effect of these changes on the subsequent health of adolescents on OC's must be determined.

18 HASHIMOTO'S THYROIDITIS IN PUBERTAL GIRLS: SUBNORMAL GONADOTROPIN SECRETION. Carol A. Huseman, Jane A. Kugler, Shashi P. Singh (Spon. by Carol R. Angie) Univ of Nebraska College of Medicine, Dept. of Ped., Omaha, Nebraska.

Elevated basal gonadotropins in primary hypothyroidism (pHT) and restoration to normal values by L-thyroxine replacement have been reported by us and others in prepubertal girls. We now report GnRH responses in 4 of these girls after 1 y L-thyroxine 0.1 mg/d given orally (Rx). All are euthyroid, pubertal stage P₂ and $\bar{x}$ Bone Age (BA)=10.3 $\pm$ 0.7 y. Mean basal and area under curve LH and FSH responses ($\bar{x} \pm SE$) to GnRH 2.5 ug/kg IV bolus were compared with responses of 7 normal prepubertal P₁ girls $\bar{x}$ BA=6.5 $\pm$ 1:

	LH		FSH		Estradiol		Prolactin	
	Basal	120' Area	Basal	120' Area	Basal	Basal	Basal	Basal
Patients	mIU/ml	mIU-min	mIU/ml	mIU-min	pg/ml	ng/ml	ng/ml	ng/ml
PreRx XBA	11 $\pm$ 2.0	2399 $\pm$ 325	4.8 $\pm$ 1.0	1593 $\pm$ 456	11 $\pm$ 0.7	12.3 $\pm$ 4.0		
8.3 $\pm$ 1 (n=5)								
6 wks (n=5)	3 $\pm$ 0.8	1463 $\pm$ 319	4.7 $\pm$ 1.0	1550 $\pm$ 350	16 $\pm$ 0.1	3.6 $\pm$ 0.4		
1 y (n=4)	1.8 $\pm$ 0.2	1599 $\pm$ 650	1.7 $\pm$ 0.4	712 $\pm$ 209	32 $\pm$ 0.5	11.0 $\pm$ 0.8		

NI (n=7) 3.3 $\pm$ 0.2 1630 $\pm$ 330 3.1 $\pm$ 0.3 2642 $\pm$ 474 11 $\pm$ 0.1 4.0 $\pm$ 1.0
FSH responses to GnRH were pubertal but the expected increase in basal and GnRH induced LH secretion did not occur. Thyroxine Rx 1) restored estradiol secretion to pubertal values in absence of pubertal LH secretion, and 2) increased the LH disappearance rate post GnRH infusion. Possibly thyroxine alters the metabolic clearance rate of either or both gonadotropins or estradiol. Clear elucidation of these interesting observations of abnormal mechanisms of pubertal development warrant further study.