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VAGUS NERVE ACTIVITY AND CYTOKINE RESPONSIVENESS IN PATIENTS WITH RHEUMATOID ARTHRITIS. R.S. Goldstein, A.N. Bruchfeld, M. Gallowitsch-Puerta, N. Patel, H. Yang, M. Rosas-Ballina, D.C. Lee, C.J. Czura, A.E. Sama, K.J. Tracey, The Feinstein Institute for Medical Research, North Shore-LIJ Health System, Manhasset, NY.

Recent literature has shown that the central nervous system can modulate the innate immune response through a rapid, local, and integrated mechanism. This pathway, termed the cholinergic anti-inflammatory pathway (CAP), acts via the vagus nerve through the neurotransmitter acetylcholine (Tracey, 2002). Activation of this pathway results in decreased proinflammatory cytokine production in in vitro experiments and in vivo models of inflammatory disease (Borovikova et al, 2000; Bernick et al, 2002). It has been observed that autonomic dysfunction develops in patients with diseases associated with cytokine excess, such as sepsis and rheumatoid arthritis (RA) (Hakala M and RK Niemela, 2000; Louthrenoo et al, 1999). However, the relationship between autonomic dysfunction and cytokine synthesis has not been explored. The purpose of this study is to explore the relationship between vagus nerve activity and cytokine synthesis in patients with RA compared to healthy subjects. A prospective observational study was performed at the North Shore-LIJ GCRC in subjects with RA and age- and sex-matched healthy volunteers ($n = 12$, 50 ± 10.9 years, $n = 13$, 42 ± 14.6, respectively). Vagus nerve activity was assessed by determining instantaneous heart rate variability (HRV) using parameters representing vagal nerve activity, including high-frequency power (HF), SDANN, and RMSSD. Blood was collected and stimulated with endotoxin and subsequently analyzed for the cytokines tumor necrosis factor (TNF) and high mobility box 1 protein (HMGB1). All measured components of HRV were attenuated in the RA subjects as compared to the healthy volunteers (HF power [msec^2] = 40 ± 8.8, 410 ± 122, $p < .01$, SDANN = 32 ± 4.5, 68 ± 12.9, $p < .05$, and RMSSD = 21 ± 0.41, 57 ± 11.1, $p < .01$, respectively). Cytokine analysis measuring serum TNF levels were attenuated in the RA group as compared to healthy volunteers (TNF [pg/mL] = $6,474 \pm 2,028$, $15,489 \pm 1,514$, $p < .01$, respectively). This supports our hypothesis that autonomic dysfunction, as reflected by lower vagal nerve output, may contribute to underlying dysfunctional cytokine activity during chronic inflammation. (Data presented as mean $\pm$ standard error and analyzed by two-tailed Student's t-test.)

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CARDIAC SYMPATHETIC DENERVATION PRECEDING PARKINSON DISEASE. D.S. Goldstein, Y. Sharabi, O. Bentho, G. Eisenhofer, Clinical Neurocardiology Section, National Institute of Neurological Disorders and Stroke, National Institutes of Health, Bethesda, MD.

All of more than 30 neuroimaging studies and at least 4 postmortem pathology studies have agreed that Parkinson disease entails a loss of myocardial noradrenergic innervation, implying that in addition to being a movement disorder from loss of nigrostriatal dopaminergic neurons, Parkinson disease is also a dysautonomia from loss of postganglionic noradrenergic neurons. Cardiac sympathetic denervation has been reported even in the earliest stages of the disease; however, whether the denervation can actually precede the movement disorder has been unknown. As part of an evaluation of hemodynamic instability suggesting pheochromocytoma, a 52-year-old man underwent 6-[18F]fluorodopamine scanning and other autonomic function tests. Four years later, over the course of 6–12 months, he developed slow movement, limb rigidity, masked face, and small handwriting and was diagnosed with mild Parkinson disease. Review of the earlier 6-[18F]fluorodopamine scan revealed that the patient had had markedly decreased 6-[18F]fluorodopamine-derived radioactivity throughout the left ventricular myocardium, confirmed by follow-up scanning. He also had had evidence of low baroreflex-cardiovagal gain and excessive adrenomedullary secretion, also confirmed at follow-up. In the interval, baroreflex-sympathoneural function declined, as indicated by development of abnormal beat-to-beat blood pressure responses to the Valsalva maneuver; however, the patient did not have orthostatic hypotension. The combination of denervation supersensitivity, baroreflex failure, and increased adrenomedullary secretion may have contributed to the patient's complaints related to neurocirculatory instability. The results lead to the proposition that cardiac sympathetic denervation may be a biomarker of presymptomatic Parkinson disease.

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EVALUATION OF NEUROPEPTIDE CONCENTRATIONS IN SERUM SAMPLES ANALYZED BY ENZYME-LINKED IMMUNOSORBENT ASSAY. L.O. Goodwin,[1] X.P. Wang,[1] C. Goodwin,[1] D. Guzowski,[1] C. Gawel,[1] A. Chandrasekaran,[1] K. Mann-Finnerty,[2] C. Correll,[3] [1]Molecular Genetics/Core Facility, [2]General Clinical Research Center, [3] Hillside Psychiatric Facility, The Feinstein Institute for Medical Research, Manhasset, NY.

Background: Clinical investigators are interested in elucidating the role of neuropeptides in diverse physiological processes. Neuropeptides act as integrative chemical messengers, from one discrete neuronal population to another. These molecules are also involved in coupling transductive events from neurons to immune cells regulating many biological functions, metabolism, and disease. Neuropeptide degradation is controlled by proteolytic enzymes and affected by disease states such as pain and analgesia, appetite control, inflammation, sepsis, mood, and affective behavior. Clarifying levels and pathways of circulating neuropeptides could drive the design of effective drugs to modulate the metabolic processes. **Methods:** We measured serum concentrations of nine different neuropeptides including NPY, AGRP, aMSH, MCH, CCK, CART, peptide YY(3–36), GLP, and Galanin by commercially available enzyme-linked immunosorbent assay (ELISA) kits (Pheonix Pharmaceuticals, Austin, TX). The peptide extraction method was essentially as recommended by the ELISA manufacturer. Micro BCA assay was used to measure total protein concentration. **Results:** The analysis of 9 neuropeptides from frozen serum samples (current GCRC study) by competitive ELISA were within the low range of the standard curve for each of the ELISAs (0.01–10 ng/mL). Considerable CV (coefficient of variability) in some duplicate samples was seen due to sensitivity of the ELISA or interference of abundant proteins within the serum samples. Thus, we analyzed the effect of peptide extraction of the serum samples. Different amounts (0–50 ng/mL) of peptideYY(3–36) was spiked into normal human serum to assess assay sensitivity. Spiked normal and four clinical sera samples were subjected to peptide extraction, and total protein and peptide YY(3–36) concentrations found for all paired extracted and nonextracted samples. There were no significant protein losses in the extracted samples as analyzed with BCA assay. However, there are significant reductions (≈50%) in peptide YY(3–36) concentrations in the four clinical serum samples that underwent peptide extraction. Peptide YY(3–36) neuropeptide may complex with bulky abundant proteins such as albumin. Removal of proteins from these serum samples did not yield higher sensitivity or improve CV, in the absence of concentrating the sera, which would reduce the sample volume and number.

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A CLINICAL STUDY OF THE EFFICACY OF THE THERAPEUTIC APPLICATION OF PLATELET-RICH PLASMA GEL ON THE SAPHENOUS VEIN HARVEST SITE IN CORONARY ARTERY BYPASS GRAFTING. L.E. Greiten, J. Copeland III, R. Bose, G. Sethi, Department of Cardiothoracic Surgery, University of Arizona College of Medicine, Tucson, AZ.

The application of platelet-rich plasma gel (PRP) to surgical wounds has been advocated during the past 11 years; however, very few studies of the efficacy of PRP gel have been performed within the cardiovascular surgery arena. Patients undergoing coronary artery bypass grafting (CABG), in which the saphenous vein is harvested, have a 10–20% risk of wound complications to the leg. Application of PRP provides hyperphysiologic levels of growth factors to the wound, with perceived benefits including less patient discomfort, shorter hospital stays, and a decreased incidence of postoperative surgical site infection. Publication of the data has the potential to impact the use of PRP gel in the cardiothoracic setting and beyond. The study's protocol dictates that the patient is used as their own control, with PRP being applied to specified incision sites during the time of surgery. To date, 14 patients (7 diabetics) have been enrolled, 31 sites used as control, and PRP application to 38 sites. Evaluations are made beginning 24 hours postoperatively addressing issues of pain, numbness, erythema, infection, swelling, and general healing. Both qualitative and quantitative evidence offer diminutive substantiation to warrant PRP application. However, the goal of the study is to evaluate patients for a minimum of 6 weeks postoperatively in order to comprehensively determine any benefits. There have been no incidences of infection in either control or application site, and only one incidence of delayed/accelerated healing has been observed in a patient with pitting peripheral edema beginning 3 days postoperatively. Ultimately, a patient population of 30–40 individuals is to be followed from which more conclusive results can be obtained.

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CLINICAL SCIENCE RESEARCH PROGRAM: THE MISSING MENTOR? D.A. Hall, M. Efird, J. Sheeder, D. Smith, C. Wells, T. Box, A.L. Shroyer, University of Colorado Health Science Center, Denver, CO.

Purpose: To fulfill a requirement of the clinical science (CLSC) course "Clinical Outcomes Assessment" at the University of Colorado, participating students in the program designed a survey to evaluate student perceptions related to the Clinical Research Training Program (CRTP) and to identify opportunities for improvement. **Methods:** The students designed a 99-question series in an on-line Web-based survey using a 5-point Likert scale to evaluate the structures, processes, and outcomes that might be anticipated from any successful NIH K-30 funded program. The survey covered the following domains: (1) self- assessments related to accreditation for GME research-related competencies; (2) course scheduling; (3) support required for manuscript/grant writing; (4) faculty mentorship; and (5) career development goals and planning. Respondents were asked about both the courses taken and their manuscript/grant writing productivity. **Summary of Results:** Sixty-five (56%) students responded. Results for the five domains included (1) statistically significant improvement in student perceptions related to their self-assessment for competencies from the start of the program to the time of survey; (2) student responses increased from "unsure"/"disagree" toward "agree" for the following constructs: (a) devise/rigorously test experimental hypotheses; (b) relate clinical research to the development of new modalities; (c) comply with ethical standards; (d) successfully conduct a clinical research project; and (e) select/apply the appropriate research method/statistical approach to a given research question. The most striking result, however, was that the CRTP was not successful in coordinating faculty mentor support for student research projects. When a mentorship was documented to exist outside of the program, almost all students were satisfied that their faculty mentoring relationship had successfully met their expectations. Approximately 78% of the student survey respondents noted a lack of satisfaction with the CLSC Program's support to find a primary faculty mentor who met their research project needs and long-term career goals. **Conclusions:** Overall, the CRTP students indicated the curriculum was successfully meeting their needs. Given that the program currently has over 78 dedicated graduate school faculty, representing a wide diversity of clinical and analytical disciplines, the survey finding that many students were missing a faculty mentorship relationship was unanticipated. Although other NIH funding options for "Mentoring a Mentor" programs exist, the program students recommended that NIH support K-30 programs incorporating this type of mentoring outreach as well as providing fiscal incentives to mentors in the future.

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CHARACTERIZATION OF DEPRESSIVE SYMPTOMS AND CD4 IN A COHORT OF HIV-POSITIVE HISPANIC WOMEN IN PUERTO RICO. R. Hechavarría, D. Blass, T. Ginebra, E. Maldonado, R. Mayo, L. Melendez, B. Santiago, V. Wojna, University of Puerto Rico, Medical Science Campus, San Juan, Puerto Rico.

Hispanic women represent one of the fastest growing groups with HIV infection in the United S. In Puerto Rico 27.4% of the reported cases of HIV/AIDS are women (1996–2004). Research focusing specially on women living with HIV is now gaining scientific attention since it has been clearly established that there are important biological, psychological, emotional, and social differences between men and women. Mood disorders, life events, stress, quality of life, and other psychosocial factors have been related to the immune function; the most common is depression. Depression is a psychological condition common in individuals with medical illnesses; estimated prevalence rates vary from 20 to 50%. An association between clinical depression and altered immune state has been suggested but has not been consistently demonstrated. The purpose of this pilot study is to correlate depressive symptoms with patients' immune state in a cohort of Hispanic HIV-positive women. A total of 47 HIV-positive women from the longitudinal cohort of NeuroAIDS program at the Medical Science Campus of the University of Puerto Rico signed informed consent. Inclusion criteria included HIV-positive women aged 18–50 years with a nadir CD4 cell count < 500 cell/mm^3 during the last year. Evaluation included participant's history, neurological and neuropsychological evaluations, and the psychosocial domain of the Menopause-Specific Quality of Life Questionnaire (MENQOL). Analysis was performed using Spearman's correlation. The mean values included age 37 (7.3), nadir CD4 cell count 218 cells/mm^3 (130). The mean

of the MENQOL psychosocial domain was 32.21 (6.9). No significant correlation was obtained between the MENQOL psychosocial domain and nadir CD4 cell count. Nevertheless, we did found a significant correlation between questions 4, 7, and 9 and nadir CD4. An inverse association between question 4 (dissatisfaction with my personal life) and nadir CD4 (rho −.320. p = .028) was obtained. Noteworthy, for questions 7 (accomplishing less than I used to) and 9 (impatient with other people) there is a positive correlation (rho = .295, p = .044 and rho = .312, p = .033, respectively). In our cohort women with HIV showed more dissatisfaction with their personal life with increased immunosuppression. However, the feeling of impatience with other people could reflect other symptoms not related to depression, like anxiety. These findings demonstrate the necessity to study emotional health in women with HIV in Puerto Rico, especially the depressive symptom and how this affects infection status

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NEUROPATTERN: A NEW DIAGNOSTIC TOOL FOR PATIENTS WITH STRESS-RELATED DISORDERS. D. Hellhammer, Department of Psychobiology, Trier University, Trier, Germany.

Stress factors play an important role in physical diseases. Given the tremendous complexity of factors affecting the crosstalk between the brain and the body, there is a broad heterogeneity in the pathogenesis of stress-related disorders among patients, even sharing similar symptoms. In addition, there is a missing covariance between the psychological and biological stress response; thus, subjective patient reports are often misleading. We here introduce "Neuropattern", a newly developed diagnostic tool for clinical practice, allowing an individualized detection of stress effects in bodily diseases. Neuropattern analyzes stress effects on neurobiological interfaces, participating in the communication between the brain and the body. Functional changes of each of these interfaces are assessed by characteristic patterns of concomitant biological, psychological, and symptomatic measures, occurring in consequence of stress. Stressed patients may differentially qualify for one or more of these neuropattern, thus facilitating highly individualized indications for therapeutic treatments.

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INSULIN RECEPTORS AS WELL AS INSULIN ARE PRESENT IN SALIVA AND NASAL MUCUS. R.I. Henkin, I. Velicu, Taste and Smell Clinic, Washington, DC.

We have recently demonstrated insulin presence in saliva and nasal mucus and that levels change in response to physiological and pathological processes. Because of these findings we wished to determine if insulin receptors were also present in saliva and in nasal mucus. We measured insulin receptor concentration (in ng/mL) by colorimetric ELISA 96-plate assay in plasma, saliva, and nasal mucus in fasting and nonfasting states in patients with a variety of diseases. Insulin receptors were present in plasma, saliva, and nasal mucus. In the fasting state in control patients insulin receptor concentration in plasma was 2.3 ± 0.3 (mean ± SEM), whereas in saliva it was 7.1 ± 0.6, significantly higher than in plasma (p < .001). In the fasting state in plasma in patients with controlled diabetes mellitus insulin receptor concentration was 21.0 ± 7.4; in saliva it was 4.0 ± 0.9, significantly lower than in plasma (p < .001). In the nonfasting state plasma insulin receptors in control patients were essentially the same as in the fasting state but in diabetics plasma insulin receptor concentration was decreased in the fasting state; in saliva, in control patients and in diabetics insulin receptor concentration was essentially the same in the fasting or nonfasting state. In nasal mucus in the nonfasting state in control patients insulin receptor concentration was 9.0 ± 1.0, about three times higher than in plasma, slightly higher than in saliva and more than twice as high as compared to diabetics. Insulin concentration relative to insulin receptor concentration in saliva in control patients and diabetics was decreased significantly comparing the nonfasting to the fasting state, whereas insulin itself was increased in both control patients and diabetics. In thin and obese patients there were changes in insulin receptor concentration in plasma, saliva, and nasal mucus relative to their physiological and pathological states. These data demonstrate that both saliva and nasal mucus contain soluble insulin receptors and indicate that these biological fluids can serve as indicators of insulin receptor metabolism. Since these fluids can be obtained with greater ease than can plasma, saliva and nasal mucus can serve as simple, useful, noninvasive indicators of insulin receptor as well as insulin metabolism. This is the first demonstration of insulin receptors in saliva and nasal mucus.

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CEREBRAL PERFUSION IN NEONATES UNDERGOING REPAIR OF COMPLEX CONGENITAL HEART DEFECTS IS DETERMINED BY CARBON DIOXIDE PREOPERATIVELY BUT BY BLOOD PRESSURE POSTOPERATIVELY. J. Henson, K. Krajewski, H. Edmonds, A. Sehic, E. Austin, M. Mitchell, University of Louisville, Louisville, KY.

Background: Preoperative studies of neonates with congenital heart disease have demonstrated that increased pCO_2 results in increased cerebral perfusion, while hyperventilation with lower levels of pCO_2 results in both less cerebral perfusion and pathologic changes on MRI brain scans. However, because hyperventilation with lower levels of pCO_2 is often essential immediately post–neonatal cardiac surgery in order to correct acidosis and promote hemodynamic stability, post–cardiopulmonary bypass ventilatory strategy is both critically important and highly controversial. In order to determine the optimal management strategy in infants undergoing heart surgery, we examined the relationship between mean arterial pressure (MAP), end tidal CO_2 (ETCO2), peripheral oxygen saturation (SaO_2), and left cerebral oxygen saturation (LSaO2) pre– and post–cardiopulmonary bypass in an anatomically homogeneous cohort of neonates undergoing primary complete cardiac repair. **Methods:** 15 neonates with interrupted aortic arch and ventricular septal defect undergoing primary complete repair at Kosair Children's Hospital were enrolled in this study. Serial simultaneous measurements of MAP, SaO_2, $ETCO_2$, and $LSaO_2$ using near-infrared spectroscopy (NIRS Somenetics Inc.) were made at 5-minute intervals pre- and postseparation from cardiopulmonary bypass. Linear and parametric regression analysis was used to look for relationships between percent change in MAP, SaO_2, ETCO2, and $LSaO_2$. **Results:** Pre–cardiopulmonary bypass, changes in cerebral saturation were related to changes in ETCO2 in a linear fashion (R^2 = .421), while there was no observed relationship to MAP (R^2 = .078). Post–cardiopulmonary bypass, changes in cerebral saturation were tightly related to changes in MAP (R^2 = .357) but not to changes in $ETCO_2$ (R^2 = .086). No relationship existed between changes in cerebral saturation and changes in SaO_2 either pre– or post–cardiopulmonary bypass. **Conclusions:** Consistent with theories of cerebral autoregulation, cerebral saturation pre–cardiopulmonary bypass was determined by changes in end tidal CO_2 but not by changes in blood pressure or peripheral oxygenation. However, this relationship was obliterated post–cardiopulmonary bypass, where changes in blood pressure became the major determinate of changes in cerebral saturation. This dysautoregulation may be secondary to cerebral edema or injury occurring during the cardiopulmonary bypass run and suggests that immediately postoperatively a strategy of hyperventilation in order to maintain mean arterial pressure is justified.

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THE QUANTITATIVE VALIDATION OF NONINVASIVE DISEASE ACTIVITY INDICES IN ULCERATIVE COLITIS. P.D.R. Higgins, I. Krokos, J. Leung, M. Schwartz, J. Mapili, E.M. Zimmermann, Department of Medicine, University of Michigan, Ann Arbor, MI.

Background and Aims: There are no validated disease activity measures for ulcerative colitis. Current methods of validation are qualitative and provide no means to compare the validity of different indices. Recent data have suggested that two noninvasive indices for ulcerative colitis, the Simple Clinical Colitis Activity Index (SCCAI) and the Seo Index, can predict clinical outcomes of remission and improvement. We performed a quantitative analysis of the psychometric and performance validity of these indices in the measurement of ulcerative colitis. **Methods:** A longitudinal cohort study of 66 patients with ulcerative colitis was performed at a tertiary care center with repeated measurement of disease activity. Subjects were evaluated with the two noninvasive indices, the St. Mark's Index, and the Inflammatory Bowel Disease Questionnaire. Subjects were also asked at each visit whether they were in remission and at the return visit whether their disease activity had changed. Psychometric validity was evaluated by quantitatively measuring the content, construct, criterion-convergent, and criterion-predictive validity on a 0–1 scale. Performance validity was evaluated by measuring the reproducibility and responsiveness on a 0–1 scale. These items were totaled to provide an overall validity score for each index. **Results:** The two noninvasive indices had good criterion-convergent and criterion-predictive validity and good reproducibility. The SCCAI was weak in its content validity and in its responsiveness. The Seo Index had weaknesses in its content validity, construct validity, and responsiveness. Both indices had fair overall validity scores, and the SCCAI was superior to the Seo Index. **Conclusions:** These two noninvasive indices for ulcerative colitis have fair overall validity and are now the most rigorously validated disease activity indices for ulcerative colitis. Both indices predict the clinical end point of patient-defined remission. These noninvasive indices can lower costs and subject discomfort in future clinical trials. Quantitative evaluation of validity identifies weaknesses in disease activity indices that can be improved and can lead to better indices of disease activity in ulcerative colitis and in other disease states.

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ANTHROPOMETRIC CHARTS FOR ACHONDROPLASIA AND OTHER SKELETAL DYSPLASIAS. J.E. Hoover-Fong,[1,2] J. McGready,[1,3] K.J. Schulze,[1,3] H. Barnes,[2] C.I. Scott,[4] [1]Johns Hopkins University, Baltimore, MD; [2]McKusick-Nathans Institute of Genetic Medicine, Greenberg Center for Skeletal Dysplasias; [3]Bloomberg School of Public Health, Baltimore, MD; [4]AI DuPont Hospital for Children, Wilmington, DE.

Accurate assessment of growth parameters in skeletal dysplasia patients is problematic with current growth curves. Most were constructed from a relatively small number of patients with a paucity of longitudinal data, from multiple clinical settings, using potentially nonstandardized observational methods. Furthermore, the curves were derived from very basic parametric analysis. Of clinical significance, weight-for-age norms are currently unavailable, despite significant negative orthopedic, neurologic, and general health sequelae caused by unrecognized and untreated obesity in the short-stature population. We have collected extensive, longitudinal anthropometric data from medical records of patients with a variety of skeletal dysplasias including achondroplasia, hypochondroplasia, spondyloepiphyseal dysplasia congenita, diastrophic dysplasia, Morquio syndrome, Kniest and metatropic dysplasia. Parameters extracted include weight, length/height, head circumference, upper and lower segments, arm span, chest circumference, inner and outer canthal distance, hand and middle digit length, gender, age, and gestational age. The primary data presented here were from subjects with achondroplasia (n = 334), the most common short-stature skeletal dysplasia, with ≈2,000 data points for height, weight, and head circumference. Age-specific percentiles (5, 25, 50, 75, and 95th) for all parameters were estimated separately for males and females over 0–36 months and 2–20 years, corresponding to the CDC growth curve format for average stature individuals. A 6-month wide "moving window" (± 3 months from age of interest) was used to estimate all age-specific percentiles. Percentiles were then smoothed using a quadratic penalized smoother, with degrees of freedom and smoothing parameter estimated by a semiparametric model approach. The magnitude and longitudinal nature of this retrospective, single-observer cohort study improve the precision of the percentile estimates as compared to all previous studies. Most importantly, novel weight for age charts for patients with achondroplasia are now available for clinical use. This methodology may be easily applied to other confirmed, nonskeletal dysplasia diagnoses to assess growth in these disorders.

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USE OF PROPHYLACTIC ANTICOAGULATION AND THE RISK OF HEPATIC VENO-OCCLUSIVE DISEASE IN PATIENTS UNDERGOING HEMATOPOIETIC STEM CELL TRANSPLANTATION: A SYSTEMATIC REVIEW AND META-ANALYSIS. H. Imran, I.M. Tleyjeh,* A. Zirakzadeh,** V. Rodriguez, S.P. Khan, Division of Pediatric Hematology/Oncology, *Division of Infectious Diseases, and the **Division of General Internal Medicine, Mayo Clinic, Rochester, MN.

Context: Hepatic veno-occlusive disease is one of the most serious regimen-related toxicities in patients undergoing hematopoietic stem cell transplantation. The prophylactic use of anticoagulation remains controversial. **Objective:** To perform a systematic review and meta-analysis of the literature on the effect of anticoagulation in preventing veno-occlusive disease. **Data Sources:** *MEDLINE, EMBASE,* and several other databases were searched. **Study Selection:** We identified randomized controlled trials and cohort studies that compared the use of unfractionated heparin or low-molecular-weight heparin for prevention of veno-occlusive disease with a nontherapeutic control in children and adults undergoing hematopoietic stem cell transplantation. **Data Extraction:** Two investigators independently identified eligible studies and assessed their quality. **Data Synthesis:** Twelve studies were eligible, with a total of 2,782 patients. Anticoagulation prophylaxis was associated with a statistically nonsignificant decrease in the risk of veno-occlusive disease (pooled rel-