

ABSTRACTS
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MEDICINE

Overweight and obesity in Colombian school children with functional gastrointestinal disorder and possible risk factors. Carlos Alberto Velasco-Benítez, Diana María Morales-Morales, Diana Patricia Henao-Rodríguez. Universidad del Valle. Cali, Colombia. **Introduction:** The prevalence of childhood overweight and obesity (OW&O) has grown at the world level. **Objective:** To determine the prevalence of OW&O in school children with functional gastrointestinal disorders (FGDs) that meet the WHO Rome III criteria who live in Cali, Colombia and, also, to establish possible associations. **Methods and materials:** This is a prevalence study of 584 school children. Socio-demographic and family factors were considered as variables. The statistical analysis included: estimation of the proportion of children with OW&O; estimation of percentages, percentiles, means, medians and other descriptive measures with corresponding standard deviations and ranges; univariate analysis; possible associations among the variables (ORs with 95% confidence intervals); exact Fisher's test with a p value <0.05, two tails, significance, and multiple logistical regression analyses. **Results:** The prevalence of OW&O was 8.8% and for FGDs it was 21.1%; the average age was 12.2 ± 2.5 , weight 46.8 ± 13.2 and height 51.1 ± 13.7 cms. There was a predominance of: males, of presenting with functional constipation, of having more than one sibling, of having separated or divorced parents, and without having family members with FGDs. There was a greater chance of having OW&O in school children of ages 10 and 11 years, among those with FGDs, those that were only children and had parents separated or divorced. There was less of an opportunity of having OW&O among school children between 13 and 17 years of age, and among those with a family history of FGDs. The variable that best explained the presence of OW&O was age (OR=0.83 CI 95% 0.7-0.9, p=0.003). **Conclusions:** The prevalence of OW&O in school children with FGDs by the Rome III criteria was 8.8%, with age being a possible risk factor.

Key words: *Overweight, Obesity, Children, Functional gastrointestinal disorders*

Anthropometric nutritional assessment in children under 14 years of age with sickle cell anemia from the "Evaristo Garcia" University Hospital of Valle in Cali, Colombia. Carlos Alberto Velasco-Benítez, Diana Soraya Rendón-Ceballos, Carlos Andrés Portilla, María

Victoria Bolaños-Gallardo, Diana Maritza Jurado-Orejuela. Universidad del Valle. Cali, Colombia.

Introduction: The anthropometric nutritional assessment of children with sickle cell anemia disease (SCD) allows for the provision of an adequate and timely nutritional recovery plan. **Objective:** To determine the prevalence of malnutrition (MN) and delayed height (DH) in children under 14 years of age with sickle cell anemia disease by means of BMI and height/age (H/A) ratios according to WHO standards among children at Evaristo Garcia University Hospital of Valle (HUV, in Spanish) in Cali, Colombia.

Methods and materials: This is a prevalence study of drepanocytosis (SCD) in children. Data were gathered including age, gender, weight, height; the data was analyzed with WHO's Anthroplus software. **Results:** Seventy children with an average age of 6.3 ± 3.8 years (range 0-14 years) were analyzed: 35 were male in gender (50.0%); average weight was 21.5 ± 10.1 kg (range 7.2 - 64.6) and height average was 113.7 ± 22.7 cm (range 67-167). The prevalence of malnutrition (MN) was 44.3% and for delayed height (DH) it was 41.4%. **Conclusions:** In this group of children with drepanocytosis from the HUV in Cali, Colombia according to BMI and H/A ratios from WHO, nearly half presented with MN and DH, corresponding to 2.9% of SP, leanness of 8.6% and 11.4% BT.

Key words: *Nutritional status, Sickle cell anemia, Children*

Prevalence of functional gastrointestinal disorders among Colombian school children, 2012. Carlos Alberto Velasco-Benítez, Luis Gabriel Vinasco-Sánchez, Margarita María Calle-Gómez. Universidad del Valle. Cali, Colombia. **Introduction:** Functional gastrointestinal disorders (FGDs) in Colombian school children had a prevalence of 26.6%. **Objective:** To determine the prevalence of FGDs from criteria of Rome III in Colombian school children from Pereira, Cúcuta and San Andrés de Sotavento, Colombia, and establish possible associations. **Methods and materials:** This was a prevalence study of 1571 school children. Socio-demographic and anthropometric factors, along with family and environmental factors were considered. The statistical analysis included: an estimation of the proportion of children with FGDs; and an estimation of percentage, percentiles, averages, medians and other descriptive measures with corresponding standard deviations and ranges;

univariate analysis; possible associations between variables (ORs with respective confidence intervals of 95%); Fisher's exact test with a probability (p) value <0.05, two tails, significance, and multiple logical regression analyses. **Results:** The prevalence of FGDs was 22.5% with the average age of 11.2±2.3 years, weight of 36.9±11.1 kg and height of 140.8±12.8 cms. There was greater likelihood of presenting with FGDs among school children from 9 to 11 years of age, who were an only child, having separated or divorced parents, with a family history of FGDs and a history of dengue in the past year. The variables that best explained the presence of FGDs were age, sex and place of origin. **Conclusions:** The prevalence of FGDs in school children according to Rome III criteria was 22.5% with possible risk factors including age, sex and place of origin.

Key words: Prevalence, School children, Functional gastrointestinal disorders

Body mass index and height for age according to WHO standards for children with HIV/AIDS with vertical transmission and dental caries in the pediatric HIV clinic in Cali, Colombia, 2013. Carlos Alberto Velasco-Benítez, María Cristina Arango-De la Cruz, Pío López-López. Universidad del Valle. Cali, Colombia **Introduction:** Tooth decay in children infected by HIV could compromise their nutritional status. **Objective:** To determine the nutritional status by means of BMI and height for age (H/A) according to WHO standards for children with HIV/AIDS infection and tooth decay, and identify possible associations. **Methodology:** This was a prevalence study to evaluate the nutritional status of 51 children with HIV/AIDS infection with vertical transmission and dental caries. Socio-demographic, clinical and paraclinical variables were considered. The statistical analysis included: estimation of measures of central tendency; univariate analysis; possible associations among variables (Odds Ratios with confidence intervals of 95%); Fisher's exact test with a p value <0,05, two tails, significant; and multiple logistical regression analyses. **Results:** There was a compromise of the BMI in 31.3% of cases and of the H/A ratio in 64.7%, along with a prevalence of tooth decay in 78.4% of participants. Average age was 124.2±34.8 months and 58.8% of subjects were females. Predominant were: males, school children, eutrophic for BMI and with a compromised height for their age, icdas 2 and viral load of less than 400 copies. There was greater compromise of the BMI found among: those of the male sex, stage C and viral load

>30,000 - <100,000 copies. There was greater compromise of the height for age ratio in: males, stage C and viral load >400 - <30,000 copies. The only possible associated factor for height for age ratios was stage (OR = 4.0, 95% CI, 1.5-10.3 p=0.004). **Conclusion:** There was a compromise of the nutritional status greater than 31.3% according to the BMI and age for height (H/A ratio) established by WHO for children with HIV/AIDS infection and tooth decay, with the only possible risk factor for H/A being the stage of the disease.

Key words: Dental caries, HIV/AIDS infection, Nutritional status, Children

Insulin resistance (HOMA, in Spanish), physical activity, lipid profile and WHO height/age ratios for overweight school children from a public school in Cali, Colombia. A follow-up program for the overweight and obese (SOS Spanish acronym) in Colombia, Carlos Alberto Velasco-Benítez, Lina María Valencia-Agudelo, Ofelia Florez-Echeverry, Oscar Hernán Jiménez-Trujillo. Universidad del Valle. Cali, Colombia. **Introduction:** One of the objectives of the Monitoring Program for Obesity and Overweight (SOS) in Colombia involves identifying the nutritional status of students from public educational institutions and private schools. **Objective:** To determine the index for insulin resistance (HOMA, Spanish), the level of physical activity (PA) (a test of resistance strength and aerobic capacity), lipid profile (LP) and anthropometry (BMI and H/A according to WHO) in overweight school children from a public school in Cali, Colombia. **Methodology:** This was a non-experimental observational descriptive prevalence rate study for school children from a public educational institution in Cali, Colombia from whom data were taken that included: age, sex, weight, height, blood glucose, insulin, LP and PA. **Results:** Forty school children were analyzed: 65% were females, with an average age of 13.9±2.5 years (range 8 to 19), an average weight of 62.4±13.8 kg (range of 29.8 to 86.5) and height of 1.55 ± 0.12 meters (range 1.2-1.79). 51.2% were at risk of being overweight, and 48.8% were overweight. The PA level was poor for 55.0%. All were normoglycemic; 25.0% had hypercholesterolemia and 32.5% had hypertriglyceridemia; 42.5% presented with an altered arterial blood index, 52.5% had a HOMA index and 28.2% had a compromised H/A ratio. **Conclusion:** More than a quarter of the overweight school children from a public educational institution in Cali, Colombia presented with a compromised nutritional status: 28.2%

in the H/A ratio, 52.5% in the measure of insulin resistance (i.e. HOMA), 55.0% with the PA level and 80.0% with one or more of the paraclinical tests for the LP (cholesterol, triglycerides, HDL c, c VLDL, LDL c, and arterial index)

Key words: *IRT (HOMA in Spanish), Physical activity, Lipid profile, Height/age, WHO, School children, Overweight, Obesity, Colombia*

Body mass index, lipid profile, stress test and nutritional survey of teachers at a private school in Cali, Colombia. The SOS Program in Colombia.

Carlos Alberto Velasco-Benítez, Lina María Valencia-Agudelo, Wilfredo Agredo-Rodríguez, Ofelia Flórez-Echeverry. Universidad del Valle. Cali, Colombia.

Introduction: Among the objectives of the Monitoring Program for Obesity and Overweight (SOS) in Colombia is to determine the nutritional status of teachers and students from public and private schools.

Objective: To determine the body mass index (BMI), lipid profile (LP), stress testing (ST) and nutritional survey (NS) in teachers from a private school in Cali, Colombia. **Methodology:** This was a descriptive, observational, non-experimental study of prevalence carried out among teachers from a private school in Cali, Colombia from whom information was taken concerning age, sex, weight, height, blood glucose levels, lip profile, stress tests and nutritional survey.

Results: Twenty-two teachers were analyzed, of which 50% were males with a mean age of 36.5 ± 7.7 years (range 27-53); the average weight was 68.0 ± 12.0 kg (range 49 to 101) and the average height was 1.65 ± 0.08 meters (range 1.52-1.79). 4.5% were obese and 54.5% were overweight. The stress test findings were found to be poor and very poor for 31.8% of participants. A hypercaloric diet was identified for 63.6%. All were normoglycemic. 13.6% presented with hypercholesterolemia, and 31.8% with hypertriglyceridaemia, while 9.0% presented with an altered arterial blood index. **Conclusion:** More than half of the private school teachers in Cali, Colombia presented a compromised nutritional status: 59.1% in the BMI, 72.7% in one or more of the paraclinical tests from the LP (cholesterol, triglycerides, HDL-c, VLDL-c, LDL c, arterial index), 81.8% in the nutritional survey and 86.4% in the stress test.

Key words: *Body mass index, Lipid profile, Nutritional survey, Stress test, Colombia*

Social representations of patients with breast cancer in Cali. Nicole Chamorro Guzmán, Andrea

Tovar Mera, Steven Vargas Gutiérrez, Mauricio Posada Carvajal, Henry Idrobo Quintero, Margarita María Velasco Paredes. Universidad del Valle. Cali, Colombia. **Introduction:** Breast cancer (BC) is the most common malignancy in women with a annual mortality rate in Cali of 17 per 100,000 persons in 2011. Social representations are socio-cultural productions that affect practices, knowledge and subjective relationships toward the disease. **Objective:** To explore social representations in relation to BC in women attending the Rafael Uribe Clinic. This is considered as a pilot study. **Method:** A qualitative exploratory pilot study. It included women between 20-69 years that attended the Rafael Uribe Clinic without a diagnosis of BC and that provided a signed informed consent agreement. Collection of data was through an in-depth interview. The analysis followed the guidelines of grounded theory. **Results:** Twenty women were interviewed with an average age of 45 years ($SD \pm 6.70$); 90% came from the urban area; 40% with a secondary education or higher. The occupations involved were: 50% housewife, 45% were dependent professionals, and 5% were independent professionals. When asked about the meaning of the BC, 100% feared suffering from the disease and 55% considered it controllable. The main cultural barriers were inaccessibility (80%), governmental negligence (55%) and lack of education (50%). 65% felt that the care provided to BC patients was deficient. If they were undergoing mastectomy for treatment, 85% felt that it affected their self-esteem and thought of themselves as disabled, including 5% that no longer felt themselves to be women. **Conclusion:** Women fear BC, they perceive that there is not adequate health care for BC patients and consider that BC would affect their self-esteem and femininity.

Key words: *Breast cancer, Women, Social impact*

Surgical treatment of bone defects with Masquelet's technique. Alfredo Martínez Rondanello, Guillermo Gómez. Universidad del Valle. Cali, Colombia.

Objective: To evaluate the results from surgical treatment of bone defects in long bones with Masquelet's technique. **Methods and materials:** The study was conducted at the University Hospital of Valle and at the Valle del Lili Foundation Treatment Center. The study was approved by the Ethics Committee of both institutions. It was conducted during May 2011 and May 2013 and involved a total of 19 patients entering the study: 17 were male and 2 were females. Bone defects from fractures were classified

as: Type I (less than 2.0 cm) – a total of 4 cases. Type II (between 2.0 and 5.0 cms) - 13 cases involved and type III (between 5.0 and 10.0 cms) - 2 such cases involved. The average patient age was 32 years of age. The cause of the fracture in twelve cases (63 %) was from traffic accidents and in seven cases (37 %) from gunshot or other explosive devices. Compromised bones included: 16 cases of the tibia, 2 cases of the femur and one case involving the humerus. All patients required debridement, placement of a methyl methacrylate spacer and gentamicin, stabilization of the fracture with interlocking intra-medullar nail in 10 cases, 6 cases with plates, and three with an external fixator. All underwent grafting from six to twelve weeks in the space where a biological membrane forms in response to the placement of the methyl methacrylate. **Results:** Of the 18 patients with a minimum follow-up of three months and maximum of 24 months, currently this number has been reduced to 16 patients (88%). Four patients were terminated (22%) with a shortening of 2.0 cm or less. During the study consolidation process, three patients (15%) had reactivation of the infectious process. The results of limb function according to Paley's criteria was considered to be good to excellent in 74% of cases. **Conclusions:** Our results from consolidation and function allow us to recommend this procedure as being feasible, safe, accurate and effective.

Key words: *Bone defect management, Membrane, Bone grafts, Autologs*

NURSING

Evaluation of a clinical care program in 18 year olds with renal replacement therapies in Cali Colombia from 2008 to 2012. Maria Adelaida Zapata Zapata, Luis Alexander Lovera Montilla, Jaime Manuel Restrepo Restrepo. Universidad del Valle. Cali, Colombia. **Introduction:** In Colombia there is little information and few research studies regarding the clinical course and outcome of interventions that both children and their families receive during their time of residence in the kidney unit with renal replacement therapy (RRT). **Objective:** To evaluate the demographic, epidemiological and clinical characteristics of the pediatric population receiving renal replacement therapy in the kidney unit of RTS Baxter in the city of Cali during the period June 2008 to June 2012. **Methodology:** A descriptive study was conducted which evaluated the demographic, epidemiological and clinical characteristics for the pediatric population who received renal replacement therapy in the RTS Baxter

renal unit in the city of Cali. **Results:** During the period set, 48 patients were evaluated that an average age of 11 years, with a range from 11 months to 18 years. Dialysis therapy was conducted on 68% of the parents, and for 28% of the patients. The etiology of 33% of the population was vesicoureteral reflux, and was glomerulopathies for 25% of patients. 72.9% of the patients were on peritoneal dialysis (PD), 27.1% of patients were on hemodialysis; 52% of the patients had a time of residence of between 1 to 2 years. **Conclusions:** In the pediatric unit, peritoneal dialysis was performed expeditiously for the management of chronic renal failure. Knowing the history of a renal pediatric program facilitates the development of further studies that increase knowledge of proper care for RRT.

Key words: *Peritoneal Dialysis, Hemodialysis, Pediatrics*

Performance of nursing graduates according to employer cohorts 2006-2011. Zaider Gloria Triviño Vargas, Hans Castro Rosero, Ana Milena Ospina Aguirre, Leidy Rios Narváez. Universidad del Valle. Cali, Colombia. **Introduction:** Accreditation is a way to attain state recognition for the quality of institutions and academic programs in higher education. Public recognition of program quality warrants the process of institutional self-assessment and employer circumspection. **Objective:** To determine the performance by a cohort group of nursing graduates from an institution of higher education in Cali for 2006-2011 according to employers. **Methodology:** The study was a quantitative and descriptive, cross-sectional study. The sample was 104 employers of nursing graduate cohorts from 2006 to 2011. Two instruments were used: one to characterize employers and graduates and the other the Multifactor Leadership Questionnaire (MLQ) with a Cronbach's alpha of 0.97 that was used in the Latin American context where employers evaluated the performance of graduates for the components of: leadership, teamwork, responsibility, decision making, user satisfaction and changes in service. **Results:** Employers were 31 years old on average: 77.9% were female, 76.9% worked in tertiary care services, 51.2% worked in accredited institutions, and 45.2% in licensed facilities. Employers rated performance on a scale of 1-5, with 1 being the lowest and 5 the highest rating. Scores of 4 and 5 were obtained for leadership among 89.4% of the sample, for teamwork this was obtained by 84.6%, for decision making, 80.7%, for responsibility, 89.5%,

user satisfaction, 95.2% and 62.5% for changes made. **Conclusion:** The performance of nursing graduates according to their employers was considered to be high. Graduates should be evaluated from the perspective of employers and users regularly to afford feedback for self-assessment processes and to make any needed improvements in the curriculum.

Key words: *Accreditation; performance*

Prolonged hospitalization and symptoms of anxiety and depression in men with an organic disease or trauma. Maira Alejandra Córdoba Mallama, Leidy Johanna Mañozca Dosman, Leidy Johanna Mañozca Dosman, Delia Burgos Dávila. Universidad del Valle. Cali, Colombia. **Introduction:** Prolonged hospitalization in patients can cause irreversible changes in functional status, changes in quality of life and complications unrelated to the problem at admission and secondary to the presence of alterations in mental health status. **Objectives:** To determine the appearance of symptoms of anxiety and depression in adult men with an organic disease or trauma who were in prolonged hospitalization at a tertiary care hospital in Southwestern Colombia. **Methodology:** This is a descriptive longitudinal study. The population consisted of men between 18 and 65 years of age that were hospitalized for at least eight days on surgical and internal medicine wards. Thirty-seven patients were included whom were given the HAD and BDI scales on three occasions (A1, A2, A3), along with a test that included socio-demographic and hospitalization data. **Results:** A total of 97.3% of the patients were hospitalized between 8 and 57 days. At A1 anxiety was found to be present in 43.2% of the population studied. At A2 anxiety symptoms were identified among 32.4% of the population and at A3 among 24.3% of the population. Symptoms of depression were found for 43.2% of the population at A1, for 43.2% of patients at A2 and among 35.1% of the patients at A3. **Conclusions:** If symptoms of anxiety and depression were determined to be present during the period of prolonged hospitalization, those which significantly rebounded in their general health status extensively altered their mental condition. Nursing care should be directed toward a vision of integrity, timely detection, monitoring and ongoing evaluation for these patients.

Key words: *Hospitalization, Depressive symptoms, Anxiety, Acute diseases, Mental health*

Ventriculoperitoneal derivation and peritoneal dialysis. Maria Adelaida Zapata Zapata, Luis Alexander

Lovera Montilla, Jaime Manuel Restrepo Restrepo, Rafael Alberto Gomez Acevedo. Universidad del Valle. Cali, Colombia. **Introduction:** Peritoneal dialysis (PD) is one of the therapies of choice for both pediatric and adult patients for its safety, effectiveness and comfort. There is a group of patients with chronic renal failure and a history of ventricular peritoneal derivation and spina bifida for which this therapy is contraindicated in the literature and the preference is to leave these patients on hemodialysis. **Objective:** To describe the experience of patients with ventricular-peritoneal shunts and peritoneal dialysis. **Method:** A retrospective descriptive study was conducted from 2003 to the present date of observing 4 patients on peritoneal dialysis with ventricular peritoneal shunt, 3 pediatric patients and 1 adult. Two of the patients were diagnosed with lumbosacral myelomeningocele, one patient with encephalocele and the other (adult) with hydrocephalus secondary to head trauma. **Results:** One patient had an episode of peritonitis at 6 months after the initiation of therapy for catheter rupture which was diagnosed by turbid fluid and abdominal pain that did not present retrograde infection of the ventricular-peritoneal shunt. None of the patients showed ultra-filtration failure with an average of 1 to 1.5 cc/kg/per hour; all dialysis patients achieved their goals. **Conclusions:** In this description of patients with ventricular-peritoneal shunts, PD has been found to be a safe therapeutic option that has reached effective levels of therapy. A review of a series of similar clinical cases is indicated to determine specific care recommendations for this group of patients where PD is a viable alternative.

Key words: *Peritoneal dialysis, Ventricular-peritoneal shunt, Renal insufficiency*

A healthy university: Involving young people. Karina Gallardo Solarte, Myriam Erazo M, Gloria Maya P. Universidad del Valle. Cali, Colombia. **Introduction:** A study conducted in an institution of higher education. **Objective:** To determine the factors related to the consumption of alcohol among university students, in order to develop an educational proposal based on Orem's self-care models and Opazo Castro's integrated model. **Methodology:** This was a descriptive, cross-sectional study conducted during the first quarter of 2012 that worked with a population of 294 students, belonging to the first through eighth semesters who consumed alcohol. **Results:** Sixty-four percent of students who live with their families started drinking at an average age of 16.1 years and 65.75% of them reported first starting between the ages of 15 to 24

years. They reported that alcohol helped them to express their feelings of enjoyment; 45.2 % reported consuming alcohol when they felt depressed; 70.9% of those surveyed from differing socioeconomic strata more frequently consumed beer, followed by 45.6% who drank liquor. 50% of students were separated and 45.7% of singles reported that their depressed mood motivated their alcohol consumption. 27.9% of singles and 22.2% of those in open relationships reported anxiety to be the motivating factor. **Conclusions:** Students in the nursing program consumed alcohol by the end of the academic term and in most cases drinking was done in bars, followed by drinking at their friend's home and with a representative proportion doing their drinking in the street, at the park or at the place of purchase.

Key words: Alcohol, Students, Nurses, Teens, Youth

Cervical-vaginal cytology among schooled adolescents: Beliefs and cultural experiences.

Isaura Barandica Rivera, Laura Alexandra Luna, Karen Alegrias, Jennifer Gutierrez, Martha Lucia Vasquez. Universidad del Valle. Cali, Colombia. **Introduction:** Cervical Cancer is a disease that is an ongoing threat to the health of women. This cancer, caused by the Human Papilloma Virus, is considered to be sexually transmitted. The health situation for adolescents is complex because not only are they starting their sexual life early with unprotected promiscuousness but also because they have inappropriate beliefs and practices about cytology as an early screening test. **Objective:** To describe the knowledge and care practices concerning cervical-vaginal cytology among adolescents being educated at a public school in Cali. **Methodology:** This was a descriptive study that sought to identify practices and beliefs surrounding the taking of vaginal cytology exams by using a focus group technique with 15 adolescents between 15 and 18 years of age. **Results:** The practice of cytology among adolescents is unusual since it is commonly associated with the necessity of having sex or with cases where STD's are suspected. Additionally, they feel embarrassed to undergo the test as they believe that it is a matter only for adult women. Young people know that it is a test that may be important in self-care but they do not know how to prepare for the sampling and what they should do with the results generated by the diagnostic test. **Conclusion:** Although adolescents know that cytology is a test that can be performed, they do not know that it serves as a means for the detection of HPV; they also lack information about

how the sampling process is carried out, and on what advice to follow prior to having it done.

Key words: Adolescent sexuality, Health beliefs, Cultural beliefs, Cultural practices

REHABILITATION

Neuromotor development in premature infants from the kangaroo program.

Juan Carlos Arias Cadavid, Andrea Cortes Osorio, Luis Fernando Rendon. Universidad del Valle. Cali, Colombia. **Introduction:** The Kangaroo Program develops a comprehensive care strategy directed toward premature infants, including follow-up on neuromotor development. **Objective:** To describe the neuromotor developmental results in premature infants evaluated with the INFANIB battery and their relationship to socio-demographic variables and perinatal history. **Method:** A cross-sectional study of children over one year of age attending the Kangaroo Program during 2010-2012 that were evaluated with INFANIB battery at 3, 6, 9 and 12 months of age. **Results:** Three hundred fifty-three children between 11 and 14 months of age were evaluated of which 55% were girls with an average gestational age of 32 weeks and birth weight of 1.58 kg. According to the INFANIB test, 52% were normal, 42% were transient and 1.5% was abnormal in the first assessment at 3 months. This assessment substantially changed at one year of age where 95% of the children were categorized as normal. The variables of weight and height at birth showed significant differences with the results from the first INFANIB assessment. The length of stay in the ICU presented significant differences from the INFANIB classification, a variable that was positively correlated with birth weight. **Conclusions:** The INFANIB test is a good alternative for detecting alterations in neuromotor development of premature babies.

Key words: Child development

2D kinematic analysis of the grasp component in manual rehabilitation.

Wilfredo Agredo Rodriguez, Diana Ximena Martínez Arce. Universidad del Valle. Cali, Colombia. **Introduction:** The grasp component is directly related to manual efficiency and affects the performance of daily living activities among persons with upper limb motor sequela. Therefore, manual rehabilitation should promote effective results within a short time and thus make therapy adjustments from 2D kinematic analysis an appropriate tool. **Objective:** The objective was to determine a protocol from a 2D

kinematic analysis to evaluate balance in manual rehabilitation. **Methodology:** This was a descriptive observational study conducted with video recordings captured in a sagittal plane from 20 healthy subjects in Cali who performed a therapeutic activity from an intervention protocol based on augmented reality and designed for the rehabilitation of persons with upper limb motor sequela after CVD. The recordings were processed with TRACKER software. **Results:** From the analysis of video recordings a sequence of steps was established to identify progress within manual rehabilitation using an augmented therapeutic activity. In addition, variables were detailed for measuring progress such as the trajectory of the hand, the speed of the hand segment, and the mobility ranges for the elbow joint. **Conclusion:** The use of a protocol for the 2D kinematic analysis allows for documentation of progress and thus permits adjustments to the process of manual rehabilitation and directly influences the results.

Key words: *Kinematics, Rehabilitation, Grasp, Stroke*

Device design for a daily living activity. Jessica Quiceno Henao, Laura Andrea Quintero Palma. Universidad del Valle. Cali, Colombia. **Introduction:** The design of a support device is shown that facilitates the feeding activity performed by a patient with congenital polyneuropathy. Activities of daily living, just cover the needed basic activities, the feeding activity is an activity that is performed repetitively and that from the biomechanical viewpoint involves upper limb articulations. **Objective:** To design and create a prototype for a device that guides the feeding motion. **Methodology:** To complete the acquisition of information, a muscular strength assessment was used (Kendall scale), along with those for ranges of motion, sensation and reflexes, and a patient survey was also conducted where needs were presented. **Results:** The prototype design was carried out by choosing from a series of proper characterizations. The patient used the first prototype, but it required changes reported by the patient and those were accomplished □□visually. **Conclusion:** Despite requiring changes as indicated by the patient, improvement was noted in joint movement and also less fatigue was indicated after doing repetitive motions.

Key words: *Activities of daily living, Polyneuropathies, Shoulder joint, Elbow joint*

Analysis of the grip component. Wilfredo Agredo Rodríguez, Diana Ximena Martínez Arce, Diego Fernando Gutiérrez. Universidad del Valle. Cali,

Colombia. **Introduction:** In various health conditions, grip may be affected and trigger limitations in activities of daily living. Knowing the components that comprise it, and improving those by interventions performed after greater knowledge of specific aspects was attained are both tasks within hand grip rehabilitation. **Objective:** To identify the intrinsic components of hand grip rehabilitation. **Methodology:** To review documents and observational descriptions regarding grip in order to detail movements and better understand its components both separately and specifically. **Results:** Based on literature reviews and video observations that allow for 3D analysis, two main components were identified: the movement of the hand toward the object and modification in the shape of the positioning of the hand and fingers in anticipation of the object's properties. **Conclusion:** Analyzing grip components allows for identification of two main factors that include motor and perceptual variables and those which should be considered in greater detail in rehabilitation processes for achieving better performance in hand functioning.

Key words: *Hand Strength, Activities of Daily Living, Rehabilitation, Occupational Therapy*

Technical help with gripping utensils for daily living activities among persons with limited joint mobility. Luis Guillermo Hernandez Rojas. Universidad del Valle. Cali, Colombia. **Introduction:** This was research on the design of devices for executing daily living activities in a population with limited joint mobility; specifically, those with a diagnosis of rheumatoid arthritis. The functional design for technical assistance to facilitate gripping of tools for the implementation of activities was generated. For the conceptual design priority was given to the specifications required of the device and for its affordability among lower SES levels. **Objective:** To generate a low cost design for a technical aid for improved grasping by persons with limited joint mobility during activities of daily living. **Methodology:** User-centered design (UCD) is a type of user-interfaced design and a process in which the needs, wants and constraints on the user are reflected in the product. Additionally, the process of developing devices proposed by Karl Ulrich was followed: use testing in normal subjects. **Results:** A square was made with an estimate of costs that showed it met the specifications at a cost of less than 7000 COP. This allows for marketing at a lower price than that of existing devices on the market, being a national design.

Conclusions: The chosen prototype fully complied with all of the goals set at the beginning of the project. The prototype is functional and its cost is economical and within the proposed range.

Key words: *Rehabilitation, Arthritis, Biomechanics, Assistive devices*

Social imaginings and disability in three companies in Cali.

Cesar Augusto Arias López, Ángela Marcela Corrales Rosero, Paola Andrea Rosero Potosí, Melania Satizabal Reyes. Universidad del Valle. Cali, Colombia.

Introduction: For the Occupational Therapist, social imaginings concerning disability are part of those contextual factors that may facilitate or hinder labor inclusion. For the development of this research, social imagining approached through the thoughts, feelings and actions that occur in the workplace between the disabled person, the boss and the co-workers.

Objective: Describe the social imagining around disability in three companies that carry out work with inclusionary processes the city of Cali. **Methodology:** Semi-structured interviews were conducted with non-participant observation by three supervisors or employers, co-workers and persons with disabilities from three companies in Cali that practice labor inclusion. **Results:** Although there is a prevalence of imaginary characteristics from the rehabilitative paradigm among colleagues and bosses it was evident that thoughts, feelings and actions tended to accept and tolerate differences, but implicitly sought out the identical and the normal. Persons with disabilities agreed with locating the disability in the environment, which is consistent with the personal autonomy paradigm and its social model. **Conclusions:** It is important that the social imaginings surrounding disability of the different actors in the workplace not only accept and tolerate differences but that they positively value them, rather than seeking the identical and normal. This helps to optimize participation and occupational performance in the job role for the person with disability.

Key words: *Occupational therapy, Disabled persons, Work*

Dilemmas of inclusive education: Attention to intercultural difference.

Lady Andrea Marin Becerra, Nohora Alexandra Villada Diaz, Luisa Fernanda Murillo Zapata, Laura Marcela Cortes Guerrero. Universidad del Valle. Cali, Colombia.

Introduction: Teaching process research conducted at the José María Carbonell Institute addressed one of the dilemmas of inclusive education

raised by Dyson and Milward and based on difference. It is marked by notable dissolution between deaf persons and hearing persons, including those on campus. **Objective:** To determine some causal variants of the dilemma and apply an educational alternative that minimizes them and proposes changes for inclusive teaching practices. **Method:** This was a qualitative research project which took as a sample six group (2011) with 24 hearing and 8 deaf students, 9 teachers and 2 interpreters to which surveys were given, along with testing and field diaries. The data was analyzed statistically and qualitatively through heuristic matrices. **Results:** Among the causal variants of this dilemma, four cross-matched issues were determined in intergroup relations: The lack of need for interaction in the context, the concept of deafness as the sole purpose of inclusion, cultural prejudices existing among students and the lack of equity between the cultural stratus of the populations served. Taking these variants as educational objectives along with determining change factors from Dyson, an intercultural project was applied to the classroom, a meeting point. **Conclusions:** From this biopsychosocial perspective comes cultural equity; the deaf population stops seeing themselves as included or disabled and begins to have social values that promotes equitable intercultural encounter between the groups served, reducing ethnocentrism while substantially improving relationships and natural encounters in the educational community.

Key words: *Integration, Education, Students, Cultural diversity*

User Interface for Assisted Walking with Exoskeleton.

Gloria Patricia Arango Hoyos, Jose Miguel Ramirez, Nicolas Valencia. Universidad del Valle. Cali, Colombia.

Objective: To evaluate and adjust user interface of a lower limb exoskeleton for gait training. **Methodology:** The evaluation was performed taking user interface into account that were designed for exoskeletons of other lower limbs, the needs expressed by a group of rehabilitation professionals and the requirements of the intervention protocols currently used for assisted rehabilitation exoskeletons. After the evaluation and identification of areas for improvement, necessary adjustments were made to the interface and operational testing with a healthy subject. **Results:** The interface developed captured four nodes of information. It relied on pressure sensors, electro-myographics and gyroscopes, which can describe the distribution of weight support, muscle

activation and joint mobility ranges of the knees and hips during walking. The information provided by the sensors is shown graphically on a monitor to provide feedback in real time to health personnel and patients. Also, databases can be created for storage of patient records obtained from each intervention and to better account for their progress over time. **Conclusions:** The tool was designed to permit communication between man and machine during gait practice, capturing valuable information to support and enhance the rehabilitation processes that currently exist. Continued work is needed on its development and implementation that seeks to convert it into a mechanism for programming and control of the exoskeleton.

Key words: *Exoskeleton, User interface, Biofeedback, Rehabilitation, Gait*

Knowledge and practice of self-care activities for structuring habits and routines. Lina Marcela Mesa-León, Natalia Palacios-Mazabel, María Helena Rubio-Grillo. Universidad del Valle. Cali, Colombia.

Introduction: The acquisition of habits and self-care pre-school activity routines are prerequisite for performing school activities. Educational personnel with comprehensive training manage tools for developing pre-school skills. However, there is no evidence that they deal with the knowledge, and specific practices and procedural skills for sequencing self-care that will facilitate the independent execution and structuring of habits and routines. **Objective:** The objective was to contribute to changing the practices of teachers with knowledge and strategies for independent execution, and for structuring habits and routines in self-care activities. **Methodology:** This was action participation research. Procedural skills were identified in the self-care activities of children by means of standardized observation. By non-participant observations and through focus groups we learned of teacher perceptions concerning the knowledge, daily practices, and methods for teaching and structuring self-care habits and routines for preschoolers. Specific strategies for sequential stimulation were negotiated. During data collection, a quantitative and qualitative analysis was conducted. **Results:** A total of 24 children between 2 and 3 years of age participated along with 4 teachers from the Kindergarten attached to a university in the city of Cali from August through June of 2012-13. Procedural skills shown for executing were at risk. Teacher perception about theoretical knowledge was basic, unknown was sequencing and strategies for improving their practices. **Conclusion:** Teachers

recognized the importance of sequential knowledge and accepted changes to their practices change from negotiated strategies that promoted the execution of self-care activities in children.

Key words: *Habits, Routines, Activities of daily living*

Occupational therapy actions in primary health care. Jaime Eduardo Sabogal Toro, Anthony Garcés Hurtado, Melania Satizabal Reyes. Universidad del Valle. Cali, Colombia. **Introduction:** Act 1438 of 2011 in Colombia does not make Occupational Therapy participation explicit in basic health care teams. This research sought to construct an approach for positioning the Occupational Therapist as an actor in primary health care (PHC) in Colombia through consideration of their role in health promotion, disease prevention, interdisciplinary work, the formation of networks and the social partition related to occupational performance. **Objective:** To identify the actions and describe the principles that provide guidance for including the Occupational Therapist in PHC in Colombia. **Methodology:** The study had a qualitative, comprehensive-historical design with an ethnographic methodology. Semi-structured interviews were conducted with academic program directors for Occupational Therapy at Colombian universities, along with interviews of Occupational Therapists with expertise in public health, and through a review of the literature. **Results:** The Occupational Therapist is trained to analyze the interactions between persons and communities at individual, family, social and cultural levels in looking to provide conceptual, philosophical and epistemological elements for understanding performance and occupation in the current Colombian social, political, economic, cultural contexts related to PHC. **Conclusions:** The conceptualization we have of PHC is heterogeneous. Currently there are two strategic approaches (selective and broad) that imply that in describing and proposing concrete actions, there are two perspectives on the interventions to consider: the first related to illness and disability with rehabilitative processes, and the second related to public participation in meaningful occupational activities within the framework of health and welfare.

Key words: *Primary Health Care, Occupational Therapy, Colombia*

Profile of school learning difficulties. Maria Cristina Otoy, Andrea Aguilar. Universidad del Valle.

Cali, Colombia. **Introduction:** In the Ten-Year Educational Plan (2004 -2014) proposed by the Municipal Education Secretary in Cali, it is stated that the local educational situation is characterized by a deficit in authorized school placements for the early childhood grades (transition), high dropout rates, and a poor quality of education. **Objectives:** The objectives were to describe the characteristics of school performance by students connected to the Itinerant Program for 2012-2013; to describe the functional profile of school learning activities; to characterize the strengths and weaknesses of reading activities and the production of written texts; and to characterize the contextual factors present at these educational sites. **Population:** Students of both sexes between 7 and 12 years of age enrolled in the first through fifth grades, and were referred by teachers. **Methods:** The research method was to review secondary sources (databases) produced during the period of June 2012 to June 2013. These contain the results of the screening process carried out with students obtained through different techniques, from language, reading and writing skills. The analysis was based on the spotlight analogy. **Results:** The performance profile for school activities was found that showed that the level reached on all tests by the referred school-aged children was less than expected for their age and level of schooling. The tests with the highest percentage of school-aged students with below average performance at poor and very poor levels were analogies, oral vocabulary, morphosyntactic closure, syntactic statements, eliminating sounds, minimal pairings, sequencing of statements and written vocabulary. In the presentations there was greater difficulty found in the use of phonics, which in turn compromised reading comprehension. **Conclusions:** Since language and reading and writing activities permeate school learning from the early years, the limitations in these activities decreases school functioning and result in poor performance.

Key words: *Learning disorders, Education, Communication disorders, Language disorders, Speech disorders, Mass screening*

The prevalence of temporomandibular disorders in music students. Sonia Osorio Toro, Karolina Lozano Patiño, Karen Reina Ocampo, Luz Karime Gomez. Universidad del Valle. Cali, Colombia. **Introduction:** Temporomandibular Disorders (TMD) are a group of conditions that affect the temporomandibular joint (TMJ), and masticator muscles. In musical performance repetitive motions are carried out along with awkward

jaw positioning that can trigger TMD. **Objective:** To determine the prevalence of TMD in a population of music students at a university in Cali. **Methods & materials:** A questionnaire and clinical examination were used with the "Diagnostic Criteria for Research on Temporomandibular Disorders" (DCR/TMD). Inter-rater reliability tests were used to measure the level of agreement between the evaluators with those of an expert. Lin's correlation coefficient for agreement (LCC) was used with results showing a substantial degree of agreement. **Results:** Eighty-one (81) students were evaluated: 79% were male and 21% were female. The average age was 26.3 ± 8.1 years; the most frequent symptoms were tinnitus with 71.60%, click in the TMJ occurred among 49.38%; 45.68% had orofacial pain and 35.80% had bruxism, which was one of the most common conditions found among students using wind instruments. The most frequent sign was a joint opening with a deviation (30.86%), and joint sounds in the right TMJ (20.99%). There was a greater prevalence of symptoms in tenth semester students. **Conclusion:** The prevalence of signs and symptoms of TMD was very common and it is of vital importance that early detection of TMD occurs to avoid disruptions that impede continuation with professional practice.

Key words: *Temporomandibular joint disorders, TMJ disorders in musicians*

Differential diagnosis and audiological monitoring of otosclerosis in Cali infants: case series. Luz Helena Serrano Giraldo, Lilian Marcela Virgen Jiménez, Angela Marcela Castillo Chávez. Universidad del Valle. Cali, Colombia. **Objective:** The objective was to describe the diagnostic processes and the medical and audiological monitoring in time series case studies and their contribution to the differential diagnosis of otosclerosis in children as they relate to other middle ear pathologies. **Method:** The research was framed as a type of descriptive study based on the methodology of time series case studies. Primary informational sources were used with interviews of caregivers and specialists, as well as through secondary sources by reviewing medical records. Persons under fifteen years of age who had a diagnosis of otosclerosis were included for persons from the city of Santiago de Cali, Colombia. **Results:** Two cases of otosclerosis are presented in subjects less than fifteen years of age for whom the processes audiological evaluation, diagnosis, treatment and follow-up by an ear, nose and throat physician (ENT) were described. Both cases had similar characteristics from audiological clinical trials

that corresponded to the first typical form or to Politzer-Siebenmann, with an obvious Carhart indentation in one case. **Conclusions:** Audiological tests allowed for the tracking of the continuous line of hearing loss in two of the case studies with a diagnosis of otosclerosis. This not only favored tracking the status of hearing, but also showed the deterioration, improvement or suspension in hearing which contributed to the identification of the characteristics of the clinical audiological tests in infants and to describing the hearing disorder in populations that are infrequently presented.

Key words: *Otosclerosis, Preschool, Hearing Loss*

Effect on physical attributes and independence with the bathing activity among clients with cardiovascular disease requiring hospitalization.

Carlos Alberto Reina Bolaños, Madeleyn Tascon Cano. Universidad del Valle. Cali, Colombia. **Introduction:** Heart disease contributes to triggering states of disequilibrium in the workplace that also limit the performance of daily living activities. The limitation presents a decrease in the range of physical qualities necessary to carry out such activities. **Objective:** The objective was to identify the effect of the implementation of graduated activities on the recovery and maintenance of physical qualities and on increasing independence with a Basic Activity of Daily Living – bathing - among clients who presented with cardiovascular disease. **Methods and materials:** The study involved quantitative research within an experimental framework. The population was composed of clients that were hospitalized in medical wards with cardiac disease. Assessments were completed before and after treatment with graduated activities and the results were examined. **Results:** Higher scores were recorded for motor skills and processing – AMPS - which at the beginning varied from 1.40 and 3.60 and at the end the ratings were between 2.00 and 3.80; independence – FIM - at the beginning ratings ranged between 66 and 107 and at the end of the ratings they were between 82 and 111; the sensation of dyspnea – NYHA -and postural accommodation - OWAS - also showed changes during the execution of the basic activity of bathing. **Conclusion:** Significant change was obtained for independence through graduated activities; however, no statistically significant changes were evident in the maintenance or recovery of physical qualities.

Key words: *Disability, Cardiac rehabilitation, Physical qualities, Independence, shower, Graduated activity, Occupational therapy*

Acoustical parameters for the normal voice among a young adult population from an institution of higher education in Santiago de Cali, Colombia.

Esperanza Sastoque Hernández, Ximena Bravo Garcés. Universidad del Valle. Cali, Colombia. **Introduction:** The parameters under which the different programs for acoustical analyses are directed were designed to yield results subject to the values established by samples from other locations, thus reducing the sensitivity of the test and making it necessary to establish parameters that resemble the reality of the population in the region in which the analysis is performed. (Cecconello, 2012). **Objective:** To describe the acoustical parameters of the normal voice in a population of young adults from a higher educational institution in Santiago de Cali through vocal evaluation by means of the ANAGRAF software. **Method:** A descriptive, cross-sectional study was conducted. A sample of 40 subjects was randomly selected that were perceptually diagnosed with normal speech and had an age range from 20 to 30 years. Data were obtained from the ANAGRAF acoustical voice analysis program at the Voice Laboratory of the School of Human Rehabilitation at Valle University. **Results:** Acoustical parameters for the normal voice among young adults (F_0 , energy, jitter, shimmer and harmonic-noise) were established which allowed these features to be analyzed with the data from other samples. The values of frequency, jitter and harmonic-noise were similar while those for shimmer and energy were greater than the reference data. **Conclusion:** The study established acoustical parameters for the normal voice in a population of young adults living in Santiago de Cali.

Key words: *Acoustic analysis, Acoustics, Voice, ANAGRAF software*

PUBLIC HEALTH

Diet, physical activity and nutritional status of nursing students.

Olga Osorio Murillo, Adela Herrera Genés. Universidad del Valle. Cali, Colombia. **Introduction:** Diet and physical activity among adolescents are subjects of interest due to their impact on current and future health. **Objective:** Evaluate food intake, physical activity and nutritional status of nursing students. **Methodology:** This is a descriptive, cross-sectional study with a sample of 127 nursing program students for whom their food intake, physical activity and nutritional status were evaluated. **Results:** Food items of greater daily consumption includes: rice, fruit juices, and a lower consumption of cooked

vegetables, salads, eggs, chicken and meat. Energy intake is adequate: the protein contribution to total calories is low, i.e. 11%; it is high for fat (43%) and low for carbohydrates it's low (43%), which indicates that there is an imbalance. 44.9% of students skipped at least one of the three main meals, especially breakfast. 25.2% of adolescents are at risk for developing behavioral disorders relative to eating. 57.5% of students are not physically active. Fifteen percent (15%) of adolescents are at risk of malnutrition, while 26.8% were overweight and 7.1% were obese. Women skipped more meals and had a higher risk of developing eating behavior disorders ($p < 0.05$). **Conclusions:** Adolescents presented eating practices that can constitute being at risk for the emergence of diseases due to inadequate food consumption and an imbalance in energy intake. They did little physical activity. They were at greater risk of being overweight and obese. They were at risk of developing eating behavioral disorders.

Key words: *Feeding, Diet, Physical activity, Nutritional status, Adolescents*

Environmental conditions and mobility on the San Fernando campus of Univalle. Elsa Patricia Muñoz Laverde, Amparo Bermudez Escobar, Jose Hernan Idrobo Benito, Juan Sebastian Peralta Saenz, Monica Rivera Valencia, Francisco Velasco Martinez, Jhonny Alberto Ocampo P, Diana Patricia Valdes Zambrano. Universidad del Valle. Cali, Colombia. **Introduction:** Mobility is understood to mean the conditions that facilitate access to the campus through various modes of transport. The San Fernando campus is located in commune 19 in an area at the foot of the mountains. Its area is 36,595 m² with 15 buildings and a green area of 20.6%, **Objective:** To determine the state of the environment at the San Fernando campus. **Methodology:** This was a descriptive observational study that used ethnographic and geo-referencing methodologies during 2012-13. **Results:** Three zones were noted that descend from the hillside, separated by roadways: the first area was composed of buildings 130, 132, 134, 135; zone two was composed of buildings 118, 117, 116, 100, 122, 124, 126, 120, and zone three was made up of buildings 110, 106, 108. There are two ways to access the campus: vehicular and pedestrian. These means are associated with roadways that connect this sector with the city (5th Street and the Intra-city Loop), among which arteries branch off in a second order that allows accessibility. The perimeter is deteriorating in its walkways and lack of walkways and it fails to comply

with the accessibility standards. Fourteen routes were identified that connect the three zones; ramps were present in zones one and two, longer routes accessed up to 80% of the total perimeter of buildings; and 20% of the perimeter is inaccessible for all types of persons. No buildings are adequately accessible to people with disabilities. **Conclusions:** Sixty-five (65%) of the campus area does not contain buildings; it is composed of deteriorating green border areas, common paved areas, circulation routes and parking areas that do not guarantee free mobility.

Key words: *Environment, structural access, Mobility limitation, Accessibility*

DENTISTRY

Identification of periodontopathic bacteria on toothbrushes with and without an antibacterial agent. Lina Maria García Zapata, natalia aragon velez, Adriana Jaramillo Echeverry. Universidad del Valle. Cali, Colombia. **Introduction:** Translocation of periodontal bacteria can occur and re-infect sites that have been previously treated, the toothbrush is a vehicle for this purpose, as well as through transmission by indirect contact between individuals. Despite the recent development of antibacterial toothbrushes, there is insufficient evidence to determine the contamination of toothbrushes with and without antibacterial treatment. **Objective:** To determine periodontal bacterial contamination on toothbrushes both with and without antibacterial treatment of its bristles. **Method:** For the 20 patients with periodontitis, two quadrants of their teeth were brushed with an antibacterial toothbrush and the remaining quadrants with a normal toothbrush (modified Bass technique). They were stored in sterile bags. At points 0, 4 and 24, four bristles were suspended and homogenized in VMGA I, and then seeded on blood agar, MacConkey and TSBV in anaerobiosis with CO₂, and identified by morphology and UV fluorescence catalase and RAPID ANA II. The CFU/ml number was compared in cultured media at different times with the Mann Whitney U ($P < 0.05$). **Results:** The most frequent diagnoses were severe or moderate chronic periodontitis (70%). Differences were found in the CFU/ml number on blood agar at 24 hours after culturing ($p = 0.011$). At three different times bacteria from the cultures were identified, including *Porphyromonas gingivalis*, *Prevotella intermedia/nigrescens*, *Fusobacterium* spp and

Eikenella corrodens, while *Tannerella forsythia*, *Eubacterium* spp and enteric bacilli were recovered only after the immediate seeding. **Conclusions:** There was less contamination on antibacterial toothbrushes but both types of brushes had bacterial contamination.

Key words: *Oral hygiene, Periodontitis, Toothbrushes*

In vitro corrosion of pillars of Cobalt-Chrome and Silver for use in rehabilitation of dental implants.

Luisa Fernanda Pacheco Muñoz, Angie Dominguez González, Herney Garzón Rayo. Universidad del Valle. Cali, Colombia. **Introduction:** Currently it is proposed to use plastic fittings for casting metal-based alloys (Co-Cr) to obtain satisfactory results at lower costs. However, this has been questioned by the difficulties in achieving a close adaptation between fittings, and additionally by its affect on the bone-implant interface through such phenomena as corrosion and galvanism. **Objective:** To evaluate in vitro the electrochemical behavior of two alloys (Au and Co-Cr) used in the rehabilitation of dental implants. **Methodology:** Four groups of implants: 1. MIS Implants, 2. Neodent implants, 3. Au MIS pillars, 4. Co-Cr Neodent pillars) were placed on acrylic specimen supports for analysis in an electrochemical cell with artificial saliva to determine: 1. corrosion by pitting and 2. potential corrosion of some of alloys. **Results:** No statistically significant differences were found (t test) among any of the brands of implants or with the Au and Co-Cr pillars for density values $\square\square$ ($p = 0.067$, $p = 0.096$), ($p = 0.134$) and potential for corrosion ($p = 0.690$, $p = 0.705$), ($p = 0.778$, $p = 0.779$) respectively. Moreover, the corrosion rate values did $\square\square$ show statistically significant differences in the two brands of implants and for the Au and Co-Cr pillars, respectively ($p = 0.019$, $p = 0.026$), ($p = 0.000$, $p = 0.001$). **Conclusions:** The behavior analyzed regarding galvanic corrosion of the couplings between Ti and the alloys of Au and Co-Cr was favorable compared to the reference value of 0.5 V. It indicates that this type of coupling between alloys allows for an implant-restoration interface that is more passive, and this may reduce bacterial colonization and possible corrosion in the union.

Key words: *Implants, Corrosion, Gold, Cobalt chrome*

"FimA genotypes for Porphyromonas gingivalis associated with periodontitis in diabetics".

Sandra Milena Moreno Correa, Adriana Jaramillo, Javier Botero, Melissa Pelaez, Adolfo Contreras. Universidad del Valle. Cali, Colombia. **Introduction:** To identify fimA genotypes for *Porphyromonas gingivalis* in

diabetic and non-diabetic patients to determine the most aggressive strains and their prevalence and distribution. **Objective:** To identify fimA genotypes for *Porphyromonas gingivalis* isolates in diabetic and non-diabetic patients. **Methods & materials:** This was a cross-sectional descriptive study that determined the frequency of 6 genotypes of FimA for *P. gingivalis* in 100 patients with periodontitis and systemically healthy and 100 diabetic patients with periodontitis using conventional PCR. **Results & discussion:** *Porphyromonas gingivalis* was positive in 72 of the 100 systemically healthy patients, unlike in diabetic patients that were positive for 31 of the 100 patients. The most prevalent genotype was FimA II, with no statistically significant differences found between the groups. The distribution for healthy patients was: FimA II (57%), FimA I (20.8%), FimA III (5.5%), FimA Ib (23.6%) and FimA IV (8.3%). For patients with diabetes the frequency was: FimA II (18.75%), FimA I (15.6%), FimA III (15.6%), FimA Ib (12.5%) and FimA IV (6.25%). There was a high correlation among positive samples for *P. gingivalis* and for *A. actinomycetemcomitans*, *T. denticola* and *T. forsythia*. **Conclusions:** The prevalence of *P. gingivalis* is high in healthy patients and low in diabetic patients, which shows the importance of the inflammatory response in diabetic patients. The distribution of the genotypes of FimA was heterogeneous. There were no statistically significant differences found. A co-infection relationship was observed between *P. gingivalis*, *T. forsythia* and *T. denticola*.

Key words: *Diabetes, Periodontal disease, Porphyromonas gingivalis, fimA genotype*

The behavior of oral cancer in Santiago de Cali, 1968-2007.

Natalia Aragon Velez, Dora Eugenia Ordoñez, Luis Eduardo Bravo. Universidad del Valle. Cali, Colombia. **Objective:** To describe incidence, mortality and survival trends from oral cancer (OCa) in Cali, Colombia during the period of 1962-2007. **Methods:** Age-standardized incidence rates (world population) (ASIR) and mortality (ASMR) for oral cancer were obtained with information from the Cancer Registry in Cali, Colombia (RPCC, Spanish acronym) and from the Secretariat Municipal Public Health in Cali (SSPM, Spanish acronym). We used the annual percentage of change (APC) to describe these trends. Kaplan Meier curve comparisons and Cox's model for proportional risks were used to evaluate survival and estimate proportional risks. **Results:** There were 1637 new cases of oral cancer registered and the average age

at the time of diagnosis was 60 years. The ASIR declined in men between 1962-2007 (APC = -1.3 (95% CI: -2.0, -0.6) and among women (APC = -1.0 (95% CI: -1.7, -0.4). The ASMR decreased only in men between 1984-2001 (APC = -2.8 (95% CI: -4.1, -1.5). The relative survival rate for oral cancer after five years in Cali was 55.5% (95% CI: 50.9-59.9). **Conclusions:** The morbidity and mortality rates for oral cancer have significantly decreased in Cali, Colombia. The type of tumor associated with these changes was the squamous cell carcinoma.

Key words: *Neoplasm, Epidemiology, Public health, Incidence, Mortality, Survey*

Bacterial colonization in esthetic self-ligating brackets. An In-Vitro Study. Andrés Felipe Lara Tafurt, Vanessa Tovar Ramírez, Juan Fernando Aristizábal. Universidad del Valle. Cali, Colombia. **Introduction:** Enamel demineralization and formation of white spot lesions are a clinical problem in orthodontics¹⁻⁴. The design and materials of the brackets can increase bacterial adhesion and the formation of dental plaque⁵⁻⁸. Currently, there are no studies evaluating the degree of bacterial colonization in esthetic self-ligating brackets (ESLB). **Objective:** The purpose of this study was to evaluate the degree of bacterial colonization (*S. mutans*) in 4 different types of ESLB. Additionally, the physicochemical characteristics of these brackets were described with Scanning Electron Microscopy (SEM). **Methods:** 52 ESLB were used from 4 commercial brands (13 per brand). For each brand, one bracket was used to evaluate the structure and chemical composition using SEM (n=4). 36 specimens were inoculated with *S. mutans* (ATCC 25175) and incubated for 12, 24, and 48 hours. For each brand, one control bracket was assigned for each time evaluated (n=12). After each time interval, the colony forming units (CFU) were quantified per brand and the bacterial adhesion in a bracket from each colonized group was analyzed through SEM. **Results:** There were no statistically significant differences when comparing the degree of bacterial colonization among the four types of brackets in any of the three evaluated times. When evaluating each brand separately, statistically significant differences were found in the degrees of bacterial colonization in the 3 times of culture (P<0.05). **Conclusions:** Regardless of differences in the design of the brackets and chemical composition of the clips, the degree of bacterial

colonization was similar in all the ESLB in each of the evaluated times.

Key words: *bacterial colonization; self-ligating brackets; white spot lesions; aesthetic brackets*

Basic Biomedical sciences. Histological description of late cardiogenesis in mice, *Mus musculus*. Yhoiss Smith Muñoz Cerón, Liliana Salazar Monsalve. Universidad del Valle. Cali, Colombia. **Introduction:** The house mouse (*mus musculus*) is the most studied species after humans and a vast literature is developing; however, there are few studies that have been carried out which detail cardiac histogenesis, therefore, this knowledge is required as a reference for researchers studying heart defects in their early stages. **Objective:** To describe histologically the internal configuration of mouse (*mus musculus*) hearts in stages E15, E17 and E18. **Method:** Mouse (*Mus musculus*) embryos were employed in stages E15, E17 and E18. Once extracted from the mother, its age was verified by morphometric measurements using the Theiler scale. Formalin was used as a fixative and Bouin solution was used as post-fixative. Dissections were performed with stereotactic surgery, conserving the thorax during stages E15 and E17. The E18 stage was dissected only to obtain the heart. The samples were embedded in paraffin and cut into coronal and sagittal sections at 4 microns, and were then stained with hematoxylin-eosin. **Results:** At E15 the heart was observed within the chest cavity surrounded by pericardium; complete septation and organization of its four chambers was observed with two ventricles and two atria. Variation was found in the size of the atria consistent with advanced age; the thickness of the ventricular wall increased and in stage E18 greater thickness was distinguished in the left ventricle. **Conclusions:** The organization of the principal heart components is complete in stage E15. In later stages the final stages of thickening and differentiation of the atrial and ventricular muscle walls was observed.

Key words: *Heart development, Cardiogenesis, Mouse embryo*

Histological comparison of *Mus musculus* palate in two stages. Estefanía Cuellar Rivas, Liliana Salazar, Carolina Pustovrh. Universidad del Valle. Cali, Colombia. **Introduction:** Palate formation is essential for separation between the nasopharynx and oropharynx. It is a complex process which occurs in mice between days 12 and 15 and any change in the regulatory development of this structure can lead to

cleft palate. Hence knowing its early histogenesis provides relevant information for understanding the anomalies associated with the nasal and oral cavities. **Objectives:** To compare the histogenesis of the palate in the embryonic stage of E15 and postnatal stage of P1 in the species *Mus musculus*. **Methodology:** The heads of the mouse *Mus musculus* in stages E15 and P1 were fixed in 10% buffered formalin and post fixed in Bouin; coronal sections of 5 microns were stained with hematoxylin-eosin and Masson trichrome. They were observed and photographed with a Leica 750 microscope. **Results:** In the E15 it was observed that there was a complete fusion of the palatine process with the disappearance of medial edge epithelium. In the P1 stage, a markedly increased vascularization, differentiation of the oral mucosa and presence of intra-membranous ossification was found. With Masson's Trichrome the development of collagen fibers were observed, which were not observed in the hard palate of E15, while a scarce presence of them were found in the P1. **Conclusion:** Palate fusion was found to already exist in stage E15. In P1 full development of oral mucosa and intra-membranous ossification was found in the maxillary prominences. The distribution and presence of collagen varied according to the stage of development.

Key words: *Histogenesis, Palatogenesis, Mus musculus*

Cytoarchitecture of layer II human prefrontal cortex.

Martha Isabel Escobar, Gabriel Arteaga, Efrain Buriticá, Universidad del Valle. Cali, Colombia. **Introduction:** The prefrontal cortex (PFC) represents the highest level of integration and control of psychic and behavioral states. Several dysfunctions in these areas have been related with alterations in the prefrontal cortex, among them: autism, hyperactivity disorders, depression and schizophrenia. The layer II of the PFC stand out because it shows a general pattern of vertical organization, a highest cell density and the major non-pyramidal/pyramidal ratio, which suggests a high inhibitory regulation maybe related with the organization of local circuits. We proposed to characterize the organization of layer II in human areas 10, 24 and 46 related with these higher mental functions. **Methods:** We studied Brodman areas 10, 46 and 24 from subjects died by different causes different to SNC illness. Antibodies against NeuN (general neuronal population) and PV, CB and CR were used to study interneuron population. **Results:** The results shows no interhemispheric asymmetries between the different areas studied in layer thickness, density of NeuN+ cells,

soma size of NeuN+ cells (specifically areas 24 and 46), density of PV+ cells, soma size of PV+ cells (specifically areas 24 and 46), density of CB+ cells, soma size of CB+ cells, density of CR+ cells, and soma size of CR+ cells (specifically areas 24 and 10). **Conclusion:** The absence of asymmetries in most of the parameters analyzed may indicate that the density of the interneuron population or the size somas between hemispheres may not explain the functional asymmetries derived from the activity of these areas in their particular tasks.

Key words: *Cerebral Cortex, Layer II, Interneurons, Working memory, Calcium binding proteins*

Evaluation of physiological stress in high performance athletes.

Blanca Cecilia Salazar Contreras, Betty Oviedo S, Isabella Echeverry, Fabio Delgado. Universidad del Valle. Cali, Colombia.

Introduction: The high demand for physical fitness in elite athletes together with the risk of exceeding training limits makes controlled adaptation to this necessary. It is reported that markers such as Creatine kinase (CPK), urea, cortisol and testosterone are parameters used in assessing physiological and metabolic stress in high-performance athletes in training. **Objectives:** To evaluate the initial behavior of biochemical markers (CPK, urea, testosterone and cortisol) in a group of high performance athletes from Valle del Cauca. **Methodology:** This is a descriptive study of 15 monofin athletes that was approved by the ethics committee of the Universidad del Valle. The training session in water varied in intensity and volume depending on the work plan for functional areas according to lactate levels, conditioning of the athlete, and the type of event involved. After two months of general training a blood sample was taken post-training for the 15 athletes to make a determination of the **d i f f e r e n g m a r k e r s .**

Results: The value of the markers found did not exceed the reference values: CPK-women: 24-170 U/L, CPK-men: 24-190 U/L, UREA: 10-50mg/dl, CORTISOL: 5-25 ug/dl, TESTOSTERONE-men: 2.4 - 18.4 ng/ml, TESTOSTERONE-women: 0.0 - 0.81 ng/dl. **Conclusion:** The training of the athletes during the period studied did not exceed their adaptive capacity to physiological stress because the values $\square \square$ found were below the reference values.

Key words: *Biochemical markers, Exercise, Physical conditioning, Physical training, Sports*

Evaluation of a new needle sharp tip during infusions on brain phantom gel. Gustavo Alejandro Orozco Grajales, Gonzalo Fernando Casanova García, Jose Jaime García Alvarez, Malisa Sarntinoranont. Universidad del Valle. Cali, Colombia. **Introduction:** Convection enhanced delivery (CED) is a method to bypass the blood-brain barrier and deliver amounts controlled of drugs over localized zones of the brain for the treatment of disorders and tumors. Several experimental studies have been tested in animals and agarose gels to understand the effect of different parameters on the outcome this procedure. In infusion experiments with brain of animals at higher flow rates showed backflow. **Objective:** The objective of this study was to evaluate whether a needle with sharp tip can reduce the backflow. **Methods:** Infusions tests were performed on in 0.6 % agarose hydrogel. The infusions were performed with Evans blue albumin. Two different tips were used: blunt and sharp tip with 0.36 mm outside diameter. **Results:** For low flow rate (0.3 and 0.5 μ l/min) the backflow lengths were similar for both needle tip geometries. In contrast, for high flow rates (1 and 2 μ l/min), blunt tip needles presented smaller backflow distances. The flow distributions with blunt tip were symmetric, while with sharp tip, backflow started on the side of hole in the infusions with sharp tip. **Conclusions:** The greater backflow distances obtained with sharp tip needle could be due to the lack of symmetry of the needle. In the process of insertion of the catheter with sharp tip, the phantom gel is compressed only on one side and produce tearing in the tissue. Different response of phantom material for each tip could explain the differences on flow distributions.

Key words: *Convection-enhanced delivery, Brain phantom gels, Backflow*

Human papilloma virus infection in placentas. Alejandra Arbeláez Vásquez, Stephania Gongora, Diana Carolina Zambrano, Fabian Fernandez, Cecilia Aguilar de Plata, Andres Castillo. Universidad del Valle. Cali, Colombia. **Introduction:** In recent years, sufficient evidence has accumulated concerning the vertical transmission of human papilloma virus (HPV); however, so far the exact transmission route and infection rate remained controversial. However, in Colombia, and specifically in the city of Cali, there has been no study conducted to evaluate this problem in our population. This is despite a high prevalence of cervical infection that occurs. Therefore, the present study was proposed to address this issue. **Objectives:** To determine the presence of HPV DNA in 289 placentas of

women who had their first apparently healthy child and come from Cali between 2010 and 2011. **Methodology:** Placental DNA was extracted and tested by amplification of the β -globin gene. The presence of HPV DNA was detected by means of nested amplification of a fragment of the L1 gene using the external primers of the MY09/MY11 pair, and using the GP5+/GP6+ pair as internal primers. **Results:** HPV DNA was detected in 8.9% (25/289) of the placental samples, which is twice the frequency reported by Syrjänen S et al. (4.2%) in the city of Turku, Finland. **Conclusion:** Our results are supported by the high prevalence of the infection in the city, and could support the hypothesis of a possible transmission route of intrauterine infection.

Key words: *HPV; placenta; vertical transmission*

Antioxidant micronutrients during pregnancy, maternal and child anthropometry. Carlos Armando Echandia, Ana Cecilia Aguilar, Miryam Romero Rengifo, Isabella Echeverry, Cristina Araujo, Adalberto Sánchez, Andrés Castillo. Universidad del Valle. Cali, Colombia. **Introduction:** Oxidative stress is a key factor in programming for chronic non-communicable diseases during pregnancy, which has led to consideration of implementing antioxidant therapies with vitamins and trace elements during pregnancy as a prevention strategy. **Objectives:** The objective was to evaluate the effect of supplementation with antioxidant micronutrients during pregnancy on maternal and infant child anthropometry. **Methodology:** Anthropometric measurements were taken for mothers in two cohort groups, along with blood samples and a food survey questionnaire that addressed food intake frequency. Participants in this controlled clinical trial were given interventions of aerobic physical exercise and antioxidant micronutrients during pregnancy between 2010 and 2011, which included their infant children. **Results:** Between November 2012 and May 2013, 38 mother-child pairs were evaluated as a control group and 36 pairs were evaluated as an intervention group that was given micronutrients. No significant differences were found in the measurements taken for mothers or children. Mothers who received micronutrients during pregnancy did tend to have a lower body mass index and a lower body fat percentage than mothers who served as controls. **Conclusion:** There is a slight indication of a protective effect from the use of preparations with antioxidant

micronutrients during pregnancy for the development of obesity and chronic non-communicable diseases.

Key words: *Micronutrients, Antioxidant, Pregnancy, Anthropometry, Child, Chronic Disease*

BACTERIOLOGY & CLINICAL LABORATORY

Phenotypic characterization of *Streptococcus agalactiae* isolates in a Colombian Hospital. Maria del Pilar Crespo Ortiz, Claudia Rocio Castañeda, Mónica Recalde, Juan Diego Vélez Londoño. Universidad del Valle. Cali, Colombia. **Introduction** *Streptococcus agalactiae* (Sag) is a leading cause of severe infections in neonates worldwide; it also affects pregnant women and immunosuppressed adults (IA) with high morbidity and mortality. In Latin America the epidemiology of Sag is still limited. Aim To better understand the behaviour of Sag infections, we have analyzed the characteristics of Colombian isolates in a tertiary care hospital at two time periods: 1994-2001 and 2004-2011. **Methods** Sag isolates were identified by biochemical tests and the susceptibility tests were performed by microdilution.

Results: In 1994-2001 a total of 201 Sag were found in urine 38.3%, vaginal exudates 27.8%, abscesses 12.9%, and blood 8.5%. Susceptibility to Ampicillin (AM) and penicillin (P) was 94%. Resistance to erythromycin (ERI) and clindamycin (CLI) were 2.8% and 5.2% respectively. In this period 17 cases of septicemia were observed: 11 (64.7%) were in neonates and 6 (35.3%) in IA. In 2004-2011 a total of 476 isolates were found in urine 41.4%, vaginal exudates 30%, abscesses 5% and blood 23.8%. Susceptibility rates to AM and P were 98.7% and 99.1% respectively. Resistance to ERI and CLI were 12.2% and 6.5% respectively. A total of 37 cases of septicemia were reported: 10 (27%) were in neonates 2 in children and 25 (67.6%) in IA. **Conclusion:** A remarkable increase in bloodstream infections in IA and a shift to early neonatal Sag infections can be seen over time. Sag isolates remain susceptible to AM and P but resistance to ERI and CLI may be a concern.

Key words: *Streptococcus agalactiae, Neonatal infection, Immunosuppression*