1369 Accuracy of Electronic Blood Pressure Devices. Y.A. LIM*, J.P. GOBETTI (Univ. of Michigan, Ann Arbor, Michigan).

Blood pressures (BP) have been measured with mercury or aneroid sphygmomanometers. The mercury has been phased out as a toxic hazard and the aneroids have inaccuracy secondary to background chair noise and hearing ability. To fill the void several electronic BP devices have been marketed. The goal of this study is to find a reasonably priced (<$100), accurate, reliable, easy-to-use electronic BP device for the dental professional. The study tested 6 electronic BP cuffs which were recommended by Consumer's Report. The "gold standard" cuff was the Vital Care™ 506DXN. The study consisted of 126 subjects, ages 17 to 86. Each subject had the medical history evaluated, previous BP recorded, then two BPs were taken five minutes apart. The participants were randomized to one of the test cuffs and to determine if the gold standard or the test cuff was used on the first reading. Test cuffs were ranked according to the mean absolute difference between each subject's systolic and diastolic test cuff measurements and the systolic and diastolic gold standard measurements. There were no significant differences between the test cuffs. One cuff, AND UA-767 was ranked the highest for both systolic and diastolic pressure (the cuff had the lowest mean absolute difference). Electronic cuffs, if properly used, are accurate and reliable for obtaining blood pressures in the dental office. Supported by the University of Michigan.

1370 Dentist-Specific Patterns of Forces are Used in Clinical Procedures. J.L. WAGNER*, C.M. STANFORD, G.W. THOMAS (University of Iowa College of Dentistry and College of Engineering, Iowa City, Iowa 52242).

The pattern of forces applied by clinicians during routine procedures can influence diagnostic decisions. **Purpose:** To use a force-detecting sleeve positioned over the machined handle of routine dental instruments. The sleeve housed 4 strain gauges (EA-06-125BZ-350) oriented at right angles to detect forces in a vertical and lateral direction relative to the long axis of the instrument. Custom analog circuitry was designed to amplify and condition the output signal. Data recordings (50Hz) with a force vs. time signal were displayed using a Data Translations 204 In/Out board and HP VEE software. **Methods:** Three fully dentate caries-free subjects (ave. age 23yrs old) were recruited and IRB informed consent obtained. Five experienced right-handed dentists (6-40yrs practice) performed full mouth routine caries and periodontal exams using the force detecting probe. All data collection was performed in a double-blinded fashion with each dentist being given a standardized profile of activities to perform and all comments audibly recorded. **Results:** Vertical and horizontal force profiles were created for each tooth explored (n=84). Three consistent but distinct patterns of probing were detected on each tooth between the five operators (triangular, square wave and irregular). Maximum vertical force varied (138-731g) between subjects (p<0.001) but one operator had significantly greater (P<0.001) forces used for both caries and periodontal probing on all subjects. Within the five operators, there were three specific characteristic styles of frequency, peak maximums, rate of loading and smoothness factor. **Conclusions:** This study demonstrated that the pattern of forces used in clinical exams can be described by a combination of peak magnitude and direction of the forces at the tip of the instrument. There were three distinctive patterns of probing that were associated with distinctive operator characteristics. P30-DE10126-09

1371 Use of Dental Imaging for Supragingival Calculus Evaluation. E.S. CHAVES*, J. BOWMAN, B. MAGGIO, R.A.C. MARCANTONIO, E. MARCANTONIO Jr., Hill Top Research, W. Palm Beach FL, USA & UNESP, Araraquara Dental School, SP, Brazil

The purpose of this research was to investigate the use of dental imaging when analyzing supragingival calculus. Thirty-eight subjects from a calculus panel at Hill Top Research were selected for this study. Teeth were completely air-dried and gauze placed to avoid saliva contacting the teeth. Clinical slides were obtained by a single clinician using standardized Lester Dine photographic equipment. Magnification was standardized by framing the mirror image from the distal lingual of lower canines and centralizing the frame at the midline of the lower central incisors. 35 mm-slides were developed and digitized using a SprintScan 35 Plus – Polaroid. Image analysis was then performed with a computerized image analysis system (Mocha Jandel Scientific). This system allowed the measurement of the total percent (%) of tooth surface area with supragingival calculus. A clinical measurement per site of each tooth was also scored using the Volpe-Manhold Index (VMI) by a clinical examiner. Statistical correlation analyses were conducted for VMI and the percent of area covered by calculus. The correlation analysis for VMI vs. percent calculus utilizing individual tooth sites resulted in a coefficient of 0.685. However, when the total VMI and total percent calculus for all 6 teeth of each subject were analyzed, the correlation coefficient was 0.825, which indicated a good correlation. This study showed that digital imaging analysis can be used for the assessment of supragingival calculus in clinical trials.

1372 DNA-Image-Cytometry: Diagnostic aid in brush cytology of oral cancer. T.W. REMMERBACH*, H. WEIDENBACH, H. MOTHERBY, A. HEMPRICH, A. BÖCKING (Univ. of Leipzig, Leipzig, Univ. of Düsseldorf, Düsseldorf, Germany).

The aim of this prospective study was to investigate the diagnostic accuracy of DNA-Image-Cytometry in addition to oral exfoliative cytology taken from suspicious oral lesions in our clinic. Cytological diagnoses obtained from 1500 exfoliative smears of 300 patients were compared with histological and/or clinical follow-ups of the respective patients. Additionally nuclear DNA contents were measured after Feulgen restaining using a TV image analysis system. DNA-aneuploidy was assumed if abnormal DNA-stemlines or cells with DNA-content greater 9c were observed. Sensitivity of our cytological diagnosis in addition to DNA-Image-Cytometry on oral smears for the detection of cancer cells was 98.2%, specificity 99.5%, positive predictive value 98.2% and negative predictive value 99.5%. One seemingly false positive case showed DNA-aneuploidy, histological no dysplasia, but a HPV-infection was observed. Six months after biopsy a leucoplakia reappeared clinically. The application of DNA-Image-Cytometry with DNA-aneuploidy as a marker for neoplastic transformation in oral smears secures cytologic diagnosis of cancer. Smears from brushings of all visible oral lesions are an easy practicable, cheap, non-invasive, painless and safe screening method for detection of oral precancerous lesions and squamous cell carcinoma in all stages. Cytologic techniques may also be used to monitor the effects of chemotherapy and identify the occurrence of recurrent tumors after surgical treatment. We conclude that DNA-Image-Cytometry is a very sensitive and highly specific, objective and reproducible adjuvant tool for identification of neoplastic cells in oral smears. remmerbach@web.de

1373 Cancellation of Coherent Artifacts in OCT Images D PIAO, Q ZHU, N DUTTA S YAN and L OTIS* University of Connecticut, Storrs, Connecticut 06269 and University of Pennsylvania Philadelphia, PA 19104

We have reported that using an erbium-doped fiber amplifier (EPDA) with a spontaneous emission centered near 1550 nm is used as a source for optical coherence tomography (OCT) resulted image artifacts at predictable locations in the image. These artifacts, termed sidelobes, increase with source current, hence there is a trade-off between the signal-to-noise ratio and image sidelobe artifact. In this paper we introduce the use of CLEAN, a nonlinear iterative deconvolution algorithm to cancel coherent sidelobes in OCT images. The CLEAN algorithm was applied to OCT images of extracted teeth made using an EPDA source. The CLEAN algorithm is described in following: Discrete representations of the dirty image, denoted as g, and the dirty beam point spread function of source is denoted as b. The algorithm iteratively constructs discrete approximants f_n to a solution f of the equation $b * f = g$ (* represents a convolution), starting with an initial approximant $f_o=0$. At the nth iteration, one searches for the peak in the residual image $g - b * f_n$. A function component centered at the location of the largest residual, and of amplitude m (the loop gain) times the largest residual, is added to f_n, to yield f_n. The search over the residual image is restricted to a region, termed the clean window. The iteration terminates with an approximate solution f_N when N equals some iteration limit N_m. To diminish spurious high spatial frequency features in the solution, f_N is convolved with a narrow elliptical Gaussian function h, termed the clean beam. OCT a-scan signals processed with CLEAN show the sidelobe artifact is eliminated and the corresponding OCT image of the dentin enamel interface becomes clearer. We conclude that the CLEAN algorithm improves OCT image quality by eliminating sidelobe artifact. Supported by the NIDCR 1R01 DE11154-04 lotis@pobox.upenn.edu

1374 Spontaneous Fluctuation in the Concentration of Oral Sulfur-containing Gases. J.R. SPRINGFIELD[1], F.L. SUAREZ[1], G.J. MAJERUS[2], P.A. LENTON[2]*, J.K. FURNE[1], J.S. HODGES[2], M.D. LEVITT[1] ([1]Minneapolis V. A. Hospital, [2]Univ. of Minnesota School of Dentistry, Minneapolis, MN, USA).

Sequential breath-gas samples often contain widely disparate concentrations of volatile sulfide compounds (VSC). It is important to resolve whether these fluctuations are due to technical problems or biological variation. **Objective:** Assess the constancy of VSC concentrations in breath samples and determine the source of variation. **Study Design:** Breath samples were collected every 2 min. for 45 to 60 min. from a convenience sample of 11 healthy volunteers having VSC concentrations >17 ppb and who had not eaten for at least three hours. VSC and Carbon dioxide (CO_2) concentrations were measured. Time trends in each subject's gas concentrations were tested using multiple linear regression. **Results:** Coefficients of variation (CV) were 0.42, 0.37 and 0.24 for hydrogen sulfide (H_2S), methyl mercaptan (MM), and dimethyl sulfide (DMS), respectively. By contrast, repeated measurements of sulfur gas, at standard concentrations in the range of those in human samples, had a CV under 0.05, indicating that variations of VSC were not due to analytical errors. CO_2 concentrations were fairly constant, indicating that the variability in VSC was not due to contamination with atmospheric or pulmonary gas. For H_2S, 3/11 subjects showed significant (p < 0.05) increasing or decreasing trends in time; for MM and DMS, 5/11 showed significant trends. The 6 subjects with a significant trend for at least one gas had mean total VSC ≥152 ppb (range 152-789 ppb); the remaining 5 subjects had mean total VSC ≤ 86 ppb (range 47-86 ppb). **Conclusion:** Minute-to-minute variability in oral sulfur gas concentration is true biological variation that can complicate the interpretation of halitosis intervention studies. It is recommended that multiple samples be taken and results averaged to decrease subject variability. Supported by NIH/NIDCR#RO1DE11252; NIH/NIDCR DE09737-09

1375 Volatile Compounds of the Oral Air and Saliva in Healthy People, in Patients with Periodontitis and Gingivitis. A.I. VOLOZHIN*, Yu.A. PETROVICH, V.K. ILYIN, E.S. FILATOVA, O.L. FOMINA, S.A. VOLOZHINA (Moscow State Univ. of Medicine and Dentistry, Moscow, Russia)

We examined 21 healthy persons , 7 patients with chronic generalized periodontitis and 4 patients with chronic generalized gingivitis aged between 18 and 42. He air from oral cavity was collected with a special device; liquid samples were obtained by rinsing the oral cavity with sterile water. Chemical compounds of the air and wash liquid were analyzed by chromato-mass-spectrometry. During periodontitis the dimethyl sulphide and dimethyl disulphide content went up in the oral air; such volatile short chain fatty acids (VSCFA) as butirate, propionate, acetate also increased while their aldehydes butyraldehyde, acroleine, acetaldehyde decreased in the fluid in periodontitis (p<0.05). In gingivitis the concentration of these compounds was found to be between the levels in control subjects and in patients with periodontitis. The level of VSCFA elevated and aldehydes decreased in the oral air and in fluids, which fact depended on the intensity of inflammation and vessel disturbances. On the basis of enzymatic reactions the possible correlation between the rise of the VSCFA level and the decrease of aldehydes was suggested. The results suggest that VSCFA produced by *Porphyromonus, Prevotella, Fusobacterium* and other periodontopathyc bacteria penetrate the oral mucosa and severely harm the periodontal tissue. The increase of dimethylsulphide contributed to oral malodor in case of periodontal inflammation.

1376 Dental Facilities as HIV Counseling and Testing Sites: Qualitative Study. L.L. PATTON*, R. P. STRAUSS, R. G. MCKAIG, D. SHUGARS. (University of North Carolina, Chapel Hill, NC, USA).

Many asymptomatic HIV-infected individuals do not seek medical treatment because they are unaware of their infection, but may seek dental care for non HIV-related problems. Thus, dental personnel may be in a unique position to identify, test and counsel at-risk patients for HIV. *Objective:* To qualitatively examine the dentist's role in HIV counseling, and testing (HIV C&T) particularly with the emergence of rapid chairside antibody testing using oral mucosal transudate. *Methods:* A national group of 13 experts in HIV care were convened for 3 in-depth conference calls to assess the: (1) status of HIV/AIDS knowledge in dental professionals, (2) financial and attitudinal barriers to HIV C&T in dental facilities and (3) dental willingness to offer counseling and health promotion. Calls were taped and qualitatively analyzed. *Results:* Perceived barriers to HIV C&T in dental settings are: (1) lack of reimbursement, (2) time for a thorough oral mucosal exam and health history, (3) lack of willingness/ability to counsel about risk behaviors, (4) avoidance of issues of sexuality and life-threatening illness, (5) lack of links to HIV caregivers, and (6) patient acceptance. Perceived benefits are: (1) increased screening of at-risk individuals, (2) widening the systemic health responsibilities of dental workers, (3) increased responsibilities for dental hygienists, (4) increased opportunities for primary and secondary HIV prevention, and (5) cost savings in public health settings. Conclusion: While HIV C&T might be undertaken in dental facilities, careful attention will need to be paid to the conditions under which oral health professionals and their patients are willing to engage in HIV health promotion and prevention efforts that go beyond traditional oral disease concerns. Supported by CDC Cooperative Agreement U48/CCU409660