status may not necessarily relate to worse psychological well-being for those with IDDM.

P119. Adherence and quality of life in adolescence: associations with personal models.

Skinner T. C.[a,b], Copp C.[b], Hampson S. E.[b] [a]Health Behaviour Unit, Department of Epidemiology and Public Health, University College London Medical School, London, and [b]Department of Psychology, University of Surrey, Guildford.

The purpose of the study was to investigate adolescents' personal models of diabetes in relation to diabetes self-care behaviours and quality of life. Thirty-three adolescents were interviewed using structured and semi-structured formats. Hampson *et al.* 's (1990, 1995) Personal Models of Diabetes Inventory was used to explore their beliefs and feelings about diabetes treatment efficacy and seriousness. Levels of self-care behaviours (diet, blood glucose testing and hypoglycaemic preparedness) were assessed using the Self-Care Adherence Inventory (SCAI) (Hanson *et al.*, 1996). Quality of life (QoL) was investigated with the Audit of Diabetes Dependant Quality of Life (ADDQoL) instrument (Bradley *et al.*, 1996). Multiple regressions indicated that beliefs about the efficacy of treatment predicted dietary self-care but not other aspects of self-care nor QoL. Beliefs about seriousness were unrelated to self-care but predicted QoL with greater perceived seriousness associated with poorer reported QoL. The assessment of personal models may have clinical utility as a consideration of the individual's perspective in education and treatment planning. This may help to improve dietary self-management and QoL. Furthermore, the balance between self-care and an individual's QoL needs further investigation as blood glucose testing and hypoglycaemic preparedness were found to be inversely related to QoL.

P120. The role of personal models of diabetes and social support in determining self-management and well-being in adolescents.

Skinner T. C.[a,b], Hampson S. E.[b] [a]Health Behaviour Unit, Department of Epidemiology and Public Health, University College London Medical School, London, and [b]Department of Psychology, University of Surrey, Guildford.

This study set out to examine whether peer support and illness representations mediate the link between family support, self-management and well-being. Fifty-two adolescents (age 12–18 years) with diabetes were followed over 6 months. They completed questionnaires on their diabetes self-management (Toobert and Glasgow, 1994), well-being (Bradley, 1994), personal models of diabetes (Hampson *et al.*, 1995), and social support from family and friends (Procidano and Heller, 1983; Schafer *et al.*, 1986; Skinner *et al.*, 1996). Over follow-up, there were significant changes in personal models of diabetes and family support. Perceived impact of diabetes and support from family and friends were prospectively predictive of participants' well-being (F=9.5; R^2=0.46; $p<0.001$). Although support from family and friends was predictive of better dietary self-care, this relationship was mediated by personal model beliefs. In particular, beliefs about the effectiveness of the diabetes treatment regimen to control diabetes and beliefs about the seriousness of diabetes, were predictive of better dietary self-care (F=9.2; R^2=0.31; $p<0.0001$). In conclusion, support from friends and family are important to adolescents as they live with their diabetes. Personal models of diabetes are important determinants of both dietary self-care and well-being. The implications for interventions to enhance adolescents' self-management of diabetes are discussed.

P121. Does diabetes impair quality of life?

Wallymahmed M. E., MacFarlane I. A. Diabetes Centre, Walton Hospital, Liverpool.

Diabetes mellitus is a condition which often leads to substantial lifestyle adjustments. Patients may have to cope with complicated treatment regimens, the burden of symptoms and complications and also uncertainty about the future. All of these may potentially lead to serious impairment of quality of life (QoL). Few studies, however, have compared QoL in people with diabetes with age and sex matched healthy controls from the same community. The aim of the study was to assess QoL in people with diabetes and compare scores with a group of healthy controls. We studied 57 people with diabetes attending routine diabetic clinics (23 male, mean age 36 years, mean duration of diabetes 6.9 years, mean haemoglobin A_{1c} 8.3%, 31 insulin treated) and 57 age and sex matched controls. QoL was assessed using the following self-rated scales: Life Fulfilment, Self Esteem, Hospital Anxiety and Depression and Mental Fatigue. There were no significant differences between these groups in any of the domains assessed. In conclusion, in this study people with diabetes attending a diabetes centre did not report any impairment in QoL when compared with healthy controls.

P122. A qualitative investigation to inform the design of quality of life measures for children with diabetes.

Wilson R. J.[a], Christie M. J.[b], Bradley C.[a] [a]Department of Psychology, Royal Holloway, University of London, London, and [b]Department of Psychology, University of York, York.

Although there are well-researched quality of life measures for adults there are no individualized diabetes-specific instruments for young children which measure the impact of diabetes on the individual child's quality of life. Qualitative research was carried out with the aim of designing three quality of life measures for children with diabetes aged 5–8, 9–12 and 13–16 years. Seventy children with diabetes attending one of four hospital clinics took part in semi-structured interviews and discussion groups. The data were analysed with a form of content analysis and used to identify important quality of life issues to be covered. Item format was also discussed with the children individually and in groups. Clinic observations, a literature review and consultations with health professionals were used to supplement the children's views and ensure the face and content validity of the new instruments. Qualitative findings guiding content are presented together with the newly designed instruments. Large-scale data collection is now required for psychometric evaluation of the new individualized quality of life measures for children with diabetes. Note

that statistical analysis was not appropriate for this qualitative research as the data were gathered using open-ended questions during semi-structured interviews and discussion groups. The raw data consisted of children's verbal reports, and were analysed using a form of content analysis, where the material for each child was initially considered separately, and the emerging quality of life themes grouped together to inform the design of the new measures.

P123. Injection related anxiety in insulin treated diabetes.

Zambanini A., Maisey M., Feher M.D. Section of Clinical Pharmacology, Imperial College School of Medicine, Chelsea and Westminster Hospital, London.

As the use of insulin in diabetes increases, the presence of injection related anxiety and phobia may influence compliance, glycaemic control and quality of life. Few studies have assessed the extent of this problem. Unselected patients (n=115; 80 Type 1, 35 Type 2) attending for routine follow-up completed a detailed questionnaire assessing anxiety and phobia symptoms. An injection anxiety score (IAS) was derived from the DSM IV diagnostic criteria for 300.29 specific phobia. A general anxiety score (GAS) was obtained from the anxiety component of the Hospital Anxiety and Depression Scale. Injections had been avoided in 14% of cases and 42% would be bothered by having to inject more frequently. An IAS $\geq$3 was seen in 28% of cases and of these 66% injected insulin $\leq$twice a day, 45% had avoided injections, and 70% reported concern should they have to inject more frequently. The median GAS in the IAS $\geq$3 was 7 compared with the IAS<3 where the median GAS was 3 ($p<0.0001$). The mean haemoglobin A_{1c} ($\pm$SD) was 9.4% (1.9%) in the IAS $\geq$3 compared with 8.9% (1.7%) in the IAS<3 (not significant). Symptoms related to insulin injection anxiety and phobia have a high prevalence in an unselected population of insulin treated diabetic patients.

P124. Serum 1,5-anhydro-D-glucitol is not an adequate marker of glycaemic control in Type 1 diabetic patients with nephropathy.

Chusney G.D.[a], Viberti G.C.[b], Pickup J.C.[a] [a]Department of Chemical Pathology and [b]Department of Endocrinology, Diabetes and Metabolic Medicine, United Medical and Dental Schools, Guy's Hospital, London.

1,5-Anhydro-D-glucitol (AG) is a proposed marker of glycaemic control in diabetes. Serum AG concentrations are lower in diabetes as a consequence of competition with glucose for reabsorption at the renal tubules. We therefore investigated the effect of various degrees of nephropathy on serum AG in Type 1 diabetes. Serum AG was measured in 19 patients with normoalbuminuria (NA) (13M/6F, albumin excretion rate (AER) 10.2 $\mu g\,min^{-1}$ [median]), 21 with microalbuminuria (MA) (18M/3F, AER 50.2 $\mu g\,min^{-1}$) and 29 with clinical proteinuria (CP) (15M/14F, AER 589 $\mu g\,min^{-1}$), matched for glycaemic control (haemoglobin A_1 (HbA_1) [mean $\pm$ SD] 9.4 $\pm$ 1.2, 9.1 $\pm$ 1.1 and 9.6 $\pm$ 1.4%). AG was not significantly different in NA vs MA (7.0, 1.8–28.8 [median, range] vs 9.4, 1.1–36.4 $\mu mol\,l^{-1}$) but was higher in CP vs NA and MA (13.7, 0.5–72.6 $\mu mol\,l^{-1}$, p=0.002 and >0.01 respectively). AG correlated with HbA_1 in NA ($p<0.01$, $r=-0.60$), but not in MA or CP. In CP, 1/creatinine correlated with AG ($r=-0.55$, $p>0.01$); no relationship was found in NA or MA. In conclusion, serum AG is a poor measure of control in Type 1 diabetic patients with nephropathy and is increased, relative to HbA_1, in Type 1 diabetic patients with clinical proteinuria, probably as a consequence of reduced glomerular filtration rate.

P125. High concentrations of lipoprotein (a) are associated with urinary protein excretion in patients with diabetes and vascular disease.

Feher M.D.[a], Zambanini A.[a], Cox A.[a], Foxton J.[a], Wierzbicki A.S.[b] [a]Section of Clinical Pharmacology, Imperial College School of Medicine, Chelsea and Westminster Hospital, London, and [b]Department of Chemical Pathology, Guy's & St Thomas' Hospital Trust, St Thomas' Hospital, London.

Mechanisms linking the association of proteinuria and cardiovascular disease (CVD) in diabetes, are at present unclear. Lp(a) is a recognized atherogenic and thrombogenic factor which at a concentration of 300 $mg\,l^{-1}$ or more, is associated with clinical CVD. Few studies have assessed the relationship between Lp(a) and proteinuria in diabetic patients with and without CVD. We performed a cross-sectional study of 287 stable diabetic patients, measuring serum Lp(a) concentration and assessing for proteinuria by both protein dipstick test and a single urine albumin to creatinine ratio. Clinical CVD was defined as the presence of ischaemic heart disease, cerebrovascular disease or peripheral vascular disease. The group comprised 175 men, 112 women, age range 22 to 96 years, duration of diabetes 1 to 61 years, and insulin treatment recorded in 26%. For the total group, there was no increased frequency of Lp(a) $\geq$ 300 $mg\,l^{-1}$ with increasing proteinuria (28% with no microalbuminuria, 26% with microalbuminuria, and 30% with proteinuria). However in the group with CVD the prevalence of Lp(a) $\geq$ 300 $mg\,l^{-1}$ was 10% with no microalbuminuria, 37% with microalbuminuria*, and 53% with proteinuria* (*$p<0.05$). Increased urinary protein excretion and Lp(a) $\geq$ 300 $mg\,l^{-1}$ are associated with CVD. This may be another mechanism explaining the excess of cardiovascular events in this population.

P126. Measurement of TIMP-1 in the serum of Type 1 diabetic patients.

Gordon D.[a], Timms P.[b], Maxwell P.[b] Departments of [a]Medicine and [b]Clinical Biochemistry, Stobhill NHS Trust, Glasgow.

It is well established that type IV collagen is increased in the thickened basement membranes of capillaries in diabetic patients. The amount of collagen in the extracellular matrix is influenced by both the rate of its production and degradation. The matrix metalloproteinases are primarily responsible for extracellular matrix breakdown. Matrix metalloproteinase activity is influenced by the presence of tissue inhibitors of metalloproteinases (TIMPs). Our aim was to investigate the plasma levels of TIMP-1 in 24 patients with Type 1 diabetes.