Budesonide combination. For retired patients, visiting the GP increased the probability of medication compliance. **CONCLUSIONS:** We concluded that inhaler devices influence patients' compliance for long-term asthma medication. The impact of DPI on medication compliance was negative. We also identified some confounders of medication compliance such as patient's age, severity of asthma, comorbidities and healthcare costs.

PMD105

EVALUATION OF INHALER TECHNIQUE MASTERY AND HANDLING ERRORS WITH SPIROMAX®, EASYHALER®, AND TURBUHALER® DEVICES (FINHALER)

Sandler N[1], Holländer J[1], Långström D[1], Santtila P[1], Saukkonen A[2], Torvinen S[3]
[1]*Åbo Akademi University, Turku, Finland,* [2]*Teva Pharmaceuticals Finland, Espoo, Finland,* [3]*Teva Pharmaceuticals Europe B.V., Amsterdam, The Netherlands*

OBJECTIVES: This single-site, cross-over study evaluated device mastery with dry powder inhalers, Spiromax®, Easyhaler® and Turbuhaler®. **METHODS:** Healthy inhaler-naïve participants aged ≥18 years (N=120) were observed using each of the three empty devices (Spiromax, Easyhaler, and Turbuhaler) in a counter-balanced order. To evaluate the proportion of participants achieving device mastery (defined as an absence of health care professional [HCP] observed errors), a three step approach was used: 1) intuitive use (no instructions), 2) use after reading the patient information leaflet (PIL) user instructions and 3) use after HCP instructions. Trained HCPs monitored use and recorded errors based on device-specific handling error checklists. **RESULTS:** During steps 1 and 2, respectively, more participants used Spiromax without error (37.5% and 93.3%; p<0.001) compared with Easyhaler (0% and 58.3%) and Turbuhaler (9.2% and 76.7%); performance level was high (>95%) with all devices during step 3. The mean proportion of errors committed by participants in steps 1 and 2 was lower with Spiromax (12.4%, 0.8%; p<0.001) compared with Easyhaler (18.7%, 5.0%) and Turbuhaler (17.6%, 2.8%); the proportion of errors for each device was similar in step 3 (0.1%, 0.5%, 0.1%, respectively). The most common errors in step 1 were related to orientation for Spiromax (51.3%), shaking for Easyhaler (95.8%), and priming for Turbuhaler (55.8%). All findings were independent of age, gender, and education level. **CONCLUSIONS:** Spiromax was associated with higher levels of device mastery evidenced by intuitive use (no instructions) or PIL information, and fewer errors compared with Easyhaler and Turbuhaler. The most common errors associated with Spiromax were related to orientation. Assessing device mastery and providing training can improve drug effectiveness which may affect adherence and overall treatment costs.

PMD106

EVALUATION OF INHALER PERCEPTION AND PREFERENCE OF SPIROMAX®, EASYHALER®, AND TURBUHALER® DEVICES (FINHALER)

Sandler N[1], Holländer J[1], Långström D[1], Santtila P[1], Saukkonen A[2], Torvinen S[3]
[1]*Åbo Akademi University, Turku, Finland,* [2]*Teva Pharmaceuticals Finland, Espoo, Finland,* [3]*Teva Pharmaceuticals Europe B.V., Amsterdam, The Netherlands*

OBJECTIVES: Patient preference and overall satisfaction with their inhaler is correlated with improved adherence, better clinical outcomes and reduced costs. This single-site, cross-over study evaluated preference with dry powder inhalers, Spiromax®, Easyhaler® and Turbuhaler®. **METHODS:** Healthy inhaler-naïve participants aged ≥18 years (N=120) were observed using each of the three empty devices (Spiromax, Easyhaler, and Turbuhaler) in a counter-balanced order. A three step approach was used: 1) intuitive use (no instructions), 2) use after reading the patient information leaflet (PIL) user instructions, and 3) use after health care professional instructions. Devices were rated using a device preference questionnaire after participants completed the three steps with each device. Participants were also asked to rate their satisfaction (on a scale from 1 [unsatisfactory] to 5 [excellent]) with the following features: 1) overall ease of use, 2) quality of PIL instructions, 3) preparing the dose, 4) inhaling procedure, and 5) clarity of dose counter. **RESULTS:** Spiromax was rated as the easiest device to use by 73.1% of participants, and 71.4% reported that if prescribed an inhaler they would prefer Spiromax. In comparison, 12.6% rated Easyhaler and 14.3% rated Turbuhaler as easiest to use; 16.8% and 11.8% would prefer Easyhaler and Turbuhaler, respectively, if prescribed an inhaler. Participants rated Spiromax significantly higher compared to both Easyhaler and Turbuhaler (p<0.001 for all comparisons) for all features except inhaling procedure, where no differences were found. Differences between Easyhaler and Turbuhaler were not significant with regards to any of the features analyzed except quality of PIL instructions, where Turbuhaler received higher ratings (p<0.003), and clarity of the counter, where Easyhaler received higher ratings (p<0.015). **CONCLUSIONS:** This study suggests that, if prescribed an inhaler product, device-naïve users prefer Spiromax and find it to be more intuitive in comparison to Easyhaler and Turbuhaler.

PMD107

PEN DEVICES FOR INSULIN ADMINISTRATION COMPARED TO NEEDLE AND VIAL: SYSTEMATIC REVIEW OF LITERATURE AND META-ANALYSIS

Lasalvia P[1], Barahona J[1], Romero D[1], Gil S[1], Castañeda-Cardona C[1], Bayona JG[1], Triana JJ[1], Laserna A[1], Restrepo P[1], Mejía M[1], Rosselli D[2]
[1]*Pontificia Universidad Javeriana, Bogota, Colombia,* [2]*Pontificia Universidade Javeriana, Bogotá, Colombia*

OBJECTIVES: Studies suggest that "pen" devices offer advantages over traditional vial and syringe method for insulin administration. Our purpose was to evaluate their efficacy safety and patient preference through a systematic review and meta-analysis. **METHODS:** A systematic review was performed using an expert-approved PICO question, in 8 different databases. References were screened by two independent investigators. Primary observational or experimental full articles comparing pen devices with vial and syringes for insulin administration in adults with diabetes mellitus were included (except gestational diabetes). Manual search for additional references was performed on selected articles. Risk of bias was evaluated using the appropriate tools. We collected data on glycosylated hemoglobin (HbA1c), hypoglycemia, adherence, persistence, patient preference and quality of life. When possible, meta-analysis was performed, evaluating the presence of heterogeneity and risk of publication bias. Otherwise, descriptive analysis of the available data was done. **RESULTS:** Of the 10.348 original references scanned, 17 studies were finally selected, 7 experimental and 10 analytical. The population included was mainly adults, with type 2 diabetes. Important risk of bias was found in all of the articles, particularly the experimental ones. Meta-analysis was performed for glycemic control, hypoglycemia, adherence and persistence. Pen devices showed better results in mean HbA1c change, frequency of hypoglycemia, adherence and persistence compared to vial and syringes. No difference was observed in number of patients achieving <7% of HbA1c. Studies regarding preference showed a clear tendency favorable to pen devices, but measurement methods were generally not well validated. One study on quality of life showed improvements in some subscales of SF-36. **CONCLUSIONS:** There is evidence that pen devices offer benefits regarding glycemic control, hypoglycemia, adherence, persistence, patient preference and quality of life compared to vial and syringes for insulin administration. However, data had considerable risk of bias, more methodologically sound studies are needed.

PMD108

HEALTH STATE UTILITIES ASSOCIATED WITH ATTRIBUTES OF WEEKLY INJECTION DEVICES FOR TREATMENT OF TYPE 2 DIABETES

Matza LS[1], Stewart KD[1], Davies EW[2], Paczkowski R[3], Boye KS[3]
[1]*Evidera, Bethesda, MD, USA,* [2]*Evidera, London, UK,* [3]*Eli Lilly and Company, Indianapolis, IN, USA*

OBJECTIVES: Several GLP-1 receptor agonists are available as weekly injections for treatment of type 2 diabetes. These medications vary in their injection delivery systems, and these differences could impact quality of life and patient preference. The purpose of this study was to estimate utilities associated with injection delivery systems for weekly GLP-1 therapies. **METHODS:** Participants diagnosed with type 2 diabetes in the UK (Inverness, Portree, Edinburgh, London) valued health states in time trade-off (TTO) interviews. The health states (drafted based on literature, device instructions for use, and clinician interviews) had identical descriptions of type 2 diabetes, but differed in description of the treatment process. One health state described an oral only treatment regimen (i.e., tablets), while six health states described oral treatment plus a weekly injection. The injection health states differed in the treatment administration process (e.g., requirements for reconstituting the medication, waiting during medication preparation, and needle handling). **RESULTS:** A total of 209 participants completed interviews (57.4% male; mean age = 60.4y; 150 patients from Scotland and 59 from London). The mean (SD) utility of the oral treatment health state was 0.89 (0.12), and all injection health states had significantly (all p < 0.01) lower utilities ranging from 0.86 (reconstitution, waiting, and handling) to 0.88 (weekly injection without any of the three treatment administration requirements). Utility differences among the injection health states suggest that each administration requirement had a small but measureable disutility (i.e., negative utility difference). Disutility values include -0.004 (reconstitution), -0.004 (needle handling), -0.010 (reconstitution, needle handling), and -0.020 (reconstitution, waiting, needle handling). **CONCLUSIONS:** Findings suggest that the TTO method may be used to quantify preferences among different injection treatment processes. It may be useful to incorporate these differences into cost-utility models comparing among weekly injectable treatment for patients with type 2 diabetes.

PMD109

HEALTH STATE UTILITIES ASSOCIATED WITH GLUCOSE MONITORING DEVICES

Matza LS[1], Stewart KD[1], Davies EW[2], Hellmund R[3], Polonsky WH[4], Kerr D[5]
[1]*Evidera, Bethesda, MD, USA,* [2]*Evidera, London, UK,* [3]*Abbott Diabetes Care, Alameda, CA, USA,* [4]*University of California San Diego, San Diego, CA, USA,* [5]*William Sansum Diabetes Center, Santa Barbara, CA, USA*

OBJECTIVES: Glucose monitoring is particularly important for patients with diabetes treated with insulin. Conventional self-monitoring of blood glucose (SMBG) requires a blood sample, typically obtained by pricking the finger with a lancing device. A new device (FreeStyle Libre™ flash glucose monitoring system) has been developed to monitor glucose levels with a sensor worn on the arm, without requiring blood samples. This study estimated utility associated with these two glucose monitoring approaches so that the values may be used in cost-utility models. **METHODS:** In time trade-off (TTO) interviews, general population participants in the UK (London, Edinburgh) valued two health states which were drafted based on literature and clinician interviews. The health states had identical descriptions of diabetes and insulin treatment, but differed in glucose monitoring with either the FreeStyle Lite™ (SMBG) or the FreeStyle Libre (flash monitoring) system. **RESULTS:** A total of 209 participants completed interviews (51.7% female; mean age = 42.1 y). Mean (SD) utilities were 0.851 (0.140) for SMBG and 0.882 (0.121) for flash monitoring (significant difference between the mean utilities; t = 8.3; p < 0.0001). Of the 209 participants, 78 (37.3%) had a higher utility for flash monitoring, two (0.96%) had a higher utility for SMBG, and 129 (61.7%) had the same utility for both health states. The mean score on a seven-point preference scale ranging from strongly prefer flash monitoring (1) to strongly prefer SMBG (7) indicates that the participants generally preferred the flash monitoring system (mean = 1.8; SD =1.5). **CONCLUSIONS:** The flash monitoring system was associated with significantly greater utility than SMBG. This difference can be used in cost-utility models, comparing the value of glucose monitoring devices for patients with diabetes. This study also demonstrates that the TTO method may be used to quantify preferences for medical devices.

PMD110

THE IMPACT OF ROBOTIC TECHNOLOGY ON NEURO-REHABILITATION: PRELIMINARY RESULTS ON ACCEPTABILITY AND EFFECTIVENESS

Turchetti G[1], Mazzoleni S[2], Dario P[2], Saldì D[1], Guglielmelli E[3]
[1]*Scuola Superiore Sant'Anna, Pisa, Italy,* [2]*Scuola Superiore Sant'Anna, Pontedera (PI), Italy,* [3]*Università Campus Bio-Medico, Roma, Italy*

OBJECTIVES: Analysis of acceptability and effectiveness of upper limb rehabilitation treatments based on two robotic systems in stroke patients. **METHODS:** Two specific