antibiogram. The performing of antibiogram provides savings of € 2,631.49 for the treatment course. The availability of resistant isolates is associated with additional costs of € 3698.39.

Conclusion The application of efficient national antibiotic policy, use of defensins and regular provision of antibiogram tests in hospitals could decrease the costs of LRTI treatment. Further studies revealing the economic consequences of the use of defensins as a special class of antimicrobial peptides should be performed.

REFERENCES AND/OR ACKNOWLEDGEMENTS

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1ISG-023 CYSTIC FIBROSIS OUTPATIENT TREATMENT COSTS: A RETROSPECTIVE ANALYSIS

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Background Cystic fibrosis (CF) is the most serious and frequent hereditary autosomal disease that causes respiratory, hepatic and pancreatic dysfunction.

Purpose To assess the pharmaceutical cost associated with CF outpatients from the Adult Cystic Fibrosis Unit at a third-level hospital.

Material and methods Retrospective observational study of CF medication in adult patients throughout the year 2017, patients without complete annual monitoring were excluded. Collected data: age, sex, mutation of cystic fibrosis transmembrane conductance regulator (CFTR) gene, forced expiratory volume in 1 s (FEV1), colonisation by *Pseudomonas aeruginosa* (PA) and drug therapy. Considered costs were laboratory selling price notified in Nomenclator. CFTR modulator drugs and hypertonic 7% sodium chloride solution as master preparation were not considered for overall costs (purchase price was zero). The SPSS program (15.0 version) was used for data analysis.

Results Fifty-nine adult patients were included, 54.2% were female and average age was 32.2 years (±9.2): 35.6% patients were homozygous for F508 deletion, 42.4% were heterozygous and 22.0% had another mutation. The average FEV1 was 72.6%: 55.9% patients were FEV1 ≥70%, 39.0% FEV1=40%–69% and 5.1% FEV1 <40%. In addition, 32.2% were colonised by sensitive PA and 8.5% by PA multidrug-resistant.

The annual cost was € 547,085.70 and the median cost was € 7,147.58 (IQR=€ 14,397.72). The average cost in homozygous patients was € 12,129.56, in heterozygous it was € 8479.80 and for other mutations it was € 6,182.32. The average cost distributed by FEV1 groups was: € 7,565.09 in patients with FEV1 ≥70%, € 117,04.65 for FEV1=40%–69% and € 9,410.16 for FEV1 <40%: all differences were statistically significant. The cost difference between patients without infection and with sensitive PA was € 77,183.31 and between multidrug-resistant PA patients it was € 10,272.82: both differences were statistically significant. High-cost medicines were dornase alfa (Pulmozyme), aztreonam (Cayston) and inhaled tobramycine (Bramitob).

Conclusion Cystic fibrosis is a relatively costly disease, although new CFTR modulator drugs will increase costs considerably. Treatment costs per patient are similar to those reported in the literature. The pulmonary function is related to treatment cost: severe dysfunction means lower expenditure than intermediate function, on account of excluding CFTR modulators. The relationship between treatment adherence and cost should be analyse in further studies.

REFERENCES AND/OR ACKNOWLEDGEMENTS

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1ISG-024 BIOSIMILARS SWITCH: DO DOCTORS AND PATIENTS REVERT BACK AFTER SWITCHING?

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Background Biosimilars are a great opportunity to improve the efficiency of health systems. Their quality is certified by regulatory agencies and high-quality clinical trials. However, some reluctance about switching between originals and biosimilars still remains between doctors and patients because of different reasons.

Purpose

To determine if doctors or patients revert back to initial treatment after switching between biologic originals and biosimilars in real life.

Material and methods Electronic prescriptions were used to identify all patients under biologic treatment who had a biosimilar available. Rituximab (Mabthera, Rixathon), etanercept (Enbrel, Benepali, Erelzi), infliximab (Remicade, Inflectra, Remsima) and filgrastim (Neupogen, Accofil) where considered. Darbepoetin (Aranesp), peg-eritropoetin beta (Mircera) and biosimilar eritropoetin alpha (Binocrit) were considered despite not being biosimilars because the hospital Formulary Committee agreed the switch between them. Patients switched from original to biosimilar or vice versa when selected for evaluation. If treatment remained unchanged after the switch until the time of evaluation it was considered successful, understanding that both the patient and the doctor where satisfied. If the change was reverted, the clinical file was reviewed to assess the reason.

Results Between September 2015 (first biosimilar prescription) and September 2018 5909 patients were treated with the above-mentioned biologics: 874 received a biosimilar but only 250 had a switch. Switch description: Etanercept: 41 patients Enbrel to Erelzi, four patients Enbrel to Benepali, three patients Benepali to Erelzi, no switch reverted. Infliximab: 34 patients Remicade to Infectra, one patient Inflectra to Remicade, no switch reverted. Eritropoetins: 12 patients Aranesp to Binocrit, no switch reverted. Filgrastim: 116 patients (74.4%) Neupogen to Accofil and 12 patients (7.7%) Accofil to Neupogen, 26 patients (16.7%) had one or more switches (mostly because of drug shortages) and two patients (1.3%) switched because of patient (fatigue) or doctor (inefficacy) decision.

Conclusion Despite initial reluctance to switch, no significant problems were identified.

Monitoring switch reversion is a useful tool to monitor problems when introducing biosimilars and may help to implement early actions if problems are detected.

Deeper analysis should be considered to evaluate changes from biosimilars to different drugs after switch.

REFERENCES AND/OR ACKNOWLEDGEMENTS
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1ISG-025 A CONNECTED APPLICATION FOR BETTER FORMATION

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Background Professional development for health practitioners is essential in maintaining knowledge and acquiring new skills. Until now, formations provided to pharmacy technicians have not been subjected to a knowledge acquisition assessment. With the emergence of connected applications, we wanted to develop our practices and offer a playful evaluation.
Purpose The objective of this work is to present and test a connected method used to evaluate the skills acquired during intra-hospital formation.
Material and methods The evaluation of this method involved the whole pharmacy (pharmacy technicians, executive and pharmacists) answering a simple choice test about a new drug. It requires the Plickers app, a smartphone with internet connection and a computer. In order to answer, each participant has a printed QR code that he orients to choose his answer. Real-time scan of the QR codes by the smartphone allows it to record the responses of each participant.

A satisfaction questionnaire was distributed at the end of the session to find out what participants thought about fluidity, duration of the quiz, difficulty and relevance of the questions, and the material available.
Results Two identical quizzes containing seven questions were conducted in two subgroups: eight pharmacists and 11 pharmacy technicians. The Plickers application connected to the smartphone and the computer allows quick management of the questionnaire. The QR-code scan was instantaneous. The average rate of correct response was 84% (89% pharmacists versus 81% pharmacy technicians). Fifteen participants answered the satisfaction questionnaire: they were satisfied or very satisfied with all the criteria, apart from the 'difficulty' criterion. Indeed, one participant found the questions too simple. Finally, participants agreed that they are more attentive to the formation and would like to perpetuate this method of evaluation.
Conclusion Evaluating, through a connected application, the knowledge acquired during a formation, helps to keep the participants' attention. The trainer can self-evaluate his intervention and identify points that need to be clarified. However, the QR code does not allow multiple-choice questions and thus increases the risk of making the questions too easy.

Connected applications make training more interactive and playful. Satisfaction of the participants shows their interest and confirms the benefit of using it in the future.

REFERENCES AND/OR ACKNOWLEDGEMENTS
https://www.plickers.com/
No conflict of interest.

1ISG-026 ABSTRACT WITHDRAWN