Background
Dispensing biologic drugs have become an exclusive competency of hospital pharmacists both in in- and outpatients in the previous years in Hungary. Poor adherence to biologics can undermine the effectiveness of these medications. It is an established fact that measuring and improving adherence has numerous clinical and economical benefits. Thus, routine monitoring have been recommended, but currently there are no standardized methods to track adherence to biologics (e.g., Blum M. A., Koo D., Doshi J. A. Measurement and Rates of Persistence with and Adherence to Biologics for Rheumatoid Arthritis: A Systematic Review. Clin. Ther. 2011; 33: 901-913), furthermore the role of pharmacist has not been supported by studies.

Purpose
Aim of our pilot study was to measure adherence to biologics, identify medication errors and to evaluate the five adherence modifying factors defined WHO. Our further objective was to improve the safe and effective storage/use of medications and to identify critical intervention points for hospital pharmacists.

Materials and methods
A 31-item self-administered questionnaire was developed by the authors based on an assessment of published literature and a four point Likert scale was used to identify lower levels of adherence. Outpatients receiving biologics for more than 12 months were included in our study. All patients were interviewed by the hospital pharmacist.

Results
(Based adherence modifying factors)

1. Social/economic factors
   - Living alone makes therapy discomfort

2. Condition-related factors
   - 57% spends everyday with rheumatoid pain

3. Therapy-related factors
   - Invasive nature of administration decreases adherence (sc injection)
   - Biologics are stored at cool temperature

4. Patient-related factors
   - Lower rate of adherence in case of self-administration
   - 60% consider the accurate timing of administration important

5. Health-system factors
   - 19% emphasized the lack of patient-centered care
   - 29% found patient-education ineffective by the health-care team

Conclusion
The ineffective patient-education caused wrong self-administration procedures and inappropriate storage several times (n=20). Adding a pharmacist to the health-care team has many benefits in improving adherence. As an outcome of our study a specific patient leaflet has been developed aiming to optimize outcomes and minimize risks of biologics used in rheumatoid diseases. However this pilot study has limitations and cannot be generalized, any future work will need to create standardized methods to measure adherence to biologics at the population level.