

PATIENT DRUG GUIDES SUPPORT SAFE MEDICATION TREATMENT AND DISCHARGE FROM THE HOSPITAL IN PEDIATRIC SPECIALIZED MEDICAL CARE

NP-003

The drug guide gathers together the most important information about medication treatment carried out at home, which is often not sufficiently available in the drug's product information. The instructional material supports medication management throughout the hospital departments.

AUTHORS: Anna Santamäki, Clinic Pharmacist (Services for Children and Adolescents) HUS Pharmacy, anna.santamaki@hus.fi; Sanni Fagerroth, Clinic Pharmacist (Services for Children and Adolescents) HUS Pharmacy; Venla Töyräs, Clinic Pharmacist (Services for Children and Adolescents) HUS Pharmacy and Sini Kuitunen, Clinic Senior Pharmacist (Services for Children and Adolescents) HUS Pharmacy

Background and Importance

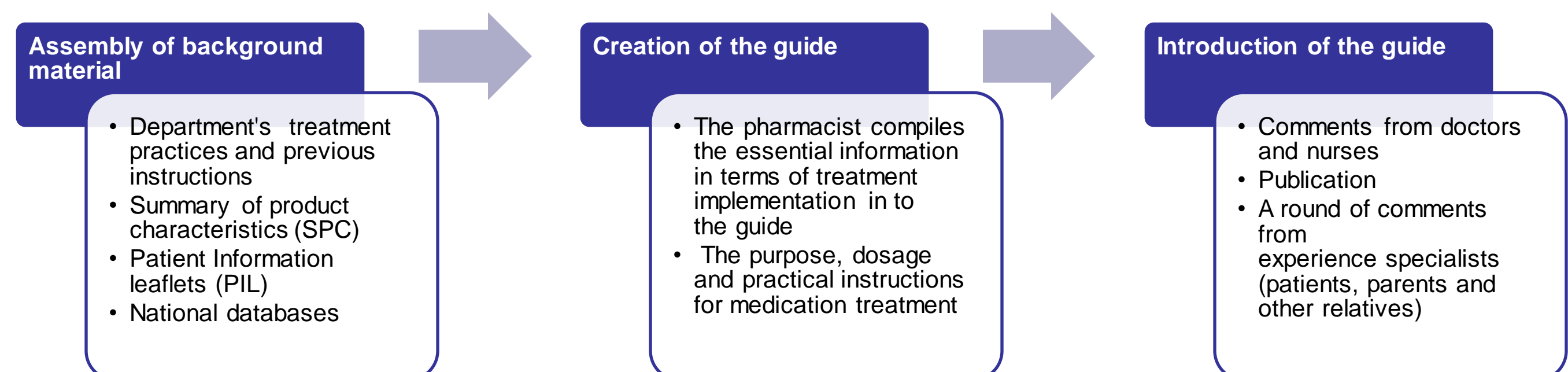
Children are susceptible to medication deviations and adverse drug events (1-3). Several high-risk medicines are used with pediatric patients both in hospitals and at home, which can lead to adverse effects if used incorrectly (1,4). Written medication instructions play a key role in ensuring medication safety both during the hospital period and after discharge, as many medications are unlicensed or used off-label in the pediatric population (1).

Aim and Objectives

The goal was to produce uniform and reliable drug instructions for pediatric specialized hospital care to support patient guidance in the hospital. The written material guides the family in the implementation of safe drug treatment also later at home.

Materials and Methods

Pharmacists prepared the guides using the department's previous instructions, manufacturer's product summaries and national databases as background. The content and structure are based on the needs and questions raised during the patient guidance (Picture 1). The guide was sent to multi-professional evaluation before official approval.



Picture 1. Guides supporting children's home medication are prepared multi-professionally based on reliable sources of information.

Guide	Need for the guide and use
The pediatric organ transplant drug guide	<ul style="list-style-type: none"> Pediatric organ transplant operations are centralized to Helsinki University Hospital (HUS) Failure of medication treatment can lead to graft loss → the need for uniform guidance material on transplant medicines (5)
Warfarin and enoxaparin patient instructions	<ul style="list-style-type: none"> Adverse events related to the home use of medicines in 2021 Challenge: no commercially available products suitable for children The need for combining tablets of different strengths (warfarin) and measuring the patient-specific dose from a vial (enoxaparin) to obtain the appropriate dose
Children's cancer drug guide: Leukemia	<ul style="list-style-type: none"> Extending pharmacist medication guidance to cancer patients The need for support material similar to the organ transplant drug guide Co-operation with pharmacy students, doctors and nurses → the guide was completed at the end of 2022

Table 1. The preparation of patient guides started with the organ transplant drug guide in 2016. Used model for the guide has also been adopted to other pediatric specialties.



Picture 2. Forbidden fruits when using ciclosporin, tacrolimus, sirolimus or everolimus. The naringenin contained in the fruits inhibits drug metabolism, which can lead to high drug concentrations.

Example of an adverse event:

The patient's warfarin dose at discharge was 2 mg x1. He had been prescribed 5 mg and 3 mg Marevan tablets to be used for the doses at home. In the home medication list it was stated that the medicine is dosed according to separate instructions. On the other hand, the medication list had a check mark for both strengths to be given at 6 p.m., which caused confusion with the caregivers. The patient accidentally received both tablets (=8 mg) as a single dose at home.

Results

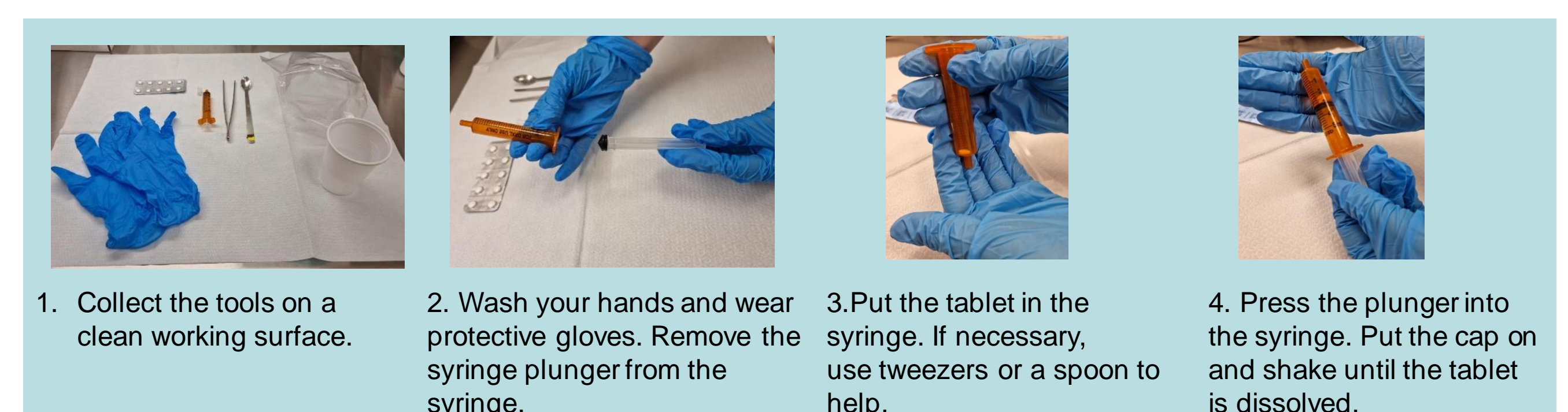
So far, drug guides have been produced for three pediatric specialties (Table 1). Guides are given to each family and are also available to other hospital districts and pharmacies through national databases (5). Warfarin and enoxaparin patient instructions have later been developed using the same ideology. Pictorial instructions provide support and certainty for the use of high-risk medicines at home by for example reducing possible risk for interactions and errors in dose calculations (Picture 2, Table 2). Children's cancer drug guide includes pictorial instructions on the safe handling of chemotherapy drugs at home (Picture 3). As a result of the medication guides, dangerous situations and contacts with the treatment unit after discharge have decreased.

Conclusion and Relevance

Pediatric drug guides enable reliable drug information for families and staff administering the medication. Written material and medication guidance should be given well in advance before discharge, so that follow-up questions are possible. With the help of the material, the family can practice handling medicines safely already in the ward.

Dose	3 mg Marevan tablet	5 mg Marevan Forte tablet	Total milligram (mg) amount of tablets
2 mg	¼ tablet	¼ tablet	0,75 mg + 1,25 mg = 2 mg
3,5 mg	¾ tablet	¼ tablet	2,25 mg + 1,25 mg = 3,5 mg
4 mg	½ tablet	½ tablet	1,5 mg + 2,5 mg = 4 mg
4,5 mg	¼ tablet	¾ tablet	0,75 mg + 3,75 mg = 4,5 mg
5,5 mg	1 tablet	½ tablet	3 mg + 2,5 mg = 5,5 mg

Table 2. An example of a patient guide for dispensing challenging medication doses. Some of the warfarin doses used in pediatrics have to be combined from different strength products using (multiple) parts of the tablets.



Picture 3. An example of safe handling of chemotherapy drugs at home: dissolving the tablet in an oral syringe.

Acknowledgements: Ida Niskanen, Pharmacist and Pharmacy students Eveliina Kylliö, Jonna Kyllönen, Jenni Laitinen, Noora Nuutila, Kushtrim Obertinca, Saija Saarikko and Vilma Saarilehto.

References: 1. Kuitunen S, et al. Duodecim 2021;137(5):515-23. 2. World Health Organization (WHO). Medication Safety in high-risk situations. The Third Global Patient Safety Challenge: Medication Without Harm. Geneva; 2019. 3. Burrus S, et al. Pediatrics. 2021 Sep;148(3):e2020030346. 4. Institute for Safe Medication Practices. ISMP list of High-Alert Medications in Acute Care Settings. 2018. 5. Santamäki A, et al. Lääkeopas yleisimmistä lasten munuaissairauksien sekä elinsiirtojen yhteydessä käytettävistä lääkkeitä. HUS Lasten ja nuorten sairaudet 2021.

