



IINCPC 2019

New Chapter in Patient Care: Medication Use
Review in the Era of Digital Care

Uus lüügi patsiendi hoolduses: ravimite kasutamise
uue ajakohase ülevaate ajast

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IT tools in dispensing and counselling of medicines in e-Estonia

Jürgen Jänese
Business manager
Apotheka

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1. Multi-dose dispensing
2. Online pharmacy
3. Repeat prescription service
4. Video pharmacist
5. E-pharmacist
6. Automated storage system

Conclusions

References

Developments in pharmaceutical care around the world



 **UBER** The world's largest taxi company owns no vehicles

 **airbnb** The largest accommodation provider owns no real estate

 **facebook** The most popular media provider creates no content

 **Instagram** The most valuable photo company sells no cameras

 **NETFLIX** The fastest growing television network lays no cables

 **Alibaba.com** The most valuable retailer has no inventory

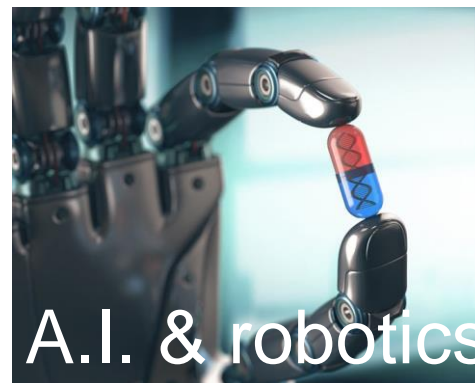
None of these six companies existed twenty years ago

UPS delivers prescription medications to US homes by drone for the first time

Delivers were made from a pharmacy in North Carolina



Vanuatu uses drones to deliver vaccines to remote island



A.I. & robotics

- The healthcare industry slowly accepts new technological trends
- Radical changes in healthcare provision take time!
- Many retail pharmacy chains have already responded to these market changes with innovative business models
- Pharmacists remain the most accessible healthcare professional – now even MORE REACHABLE through apps.
- The role of the pharmacist is changing and will continue to change alongside the needs and expectations of patients and services

Physician
 Pharmaceutical Care
 Personal
 Pharmacy Technology Health medicine
 Vaccine Immunization E-medicine
 Healthcare Digital health Apps
 Patient Monitors R&D Wearables
 Disease Pharmacogenetics
 Pharmaceutical industry



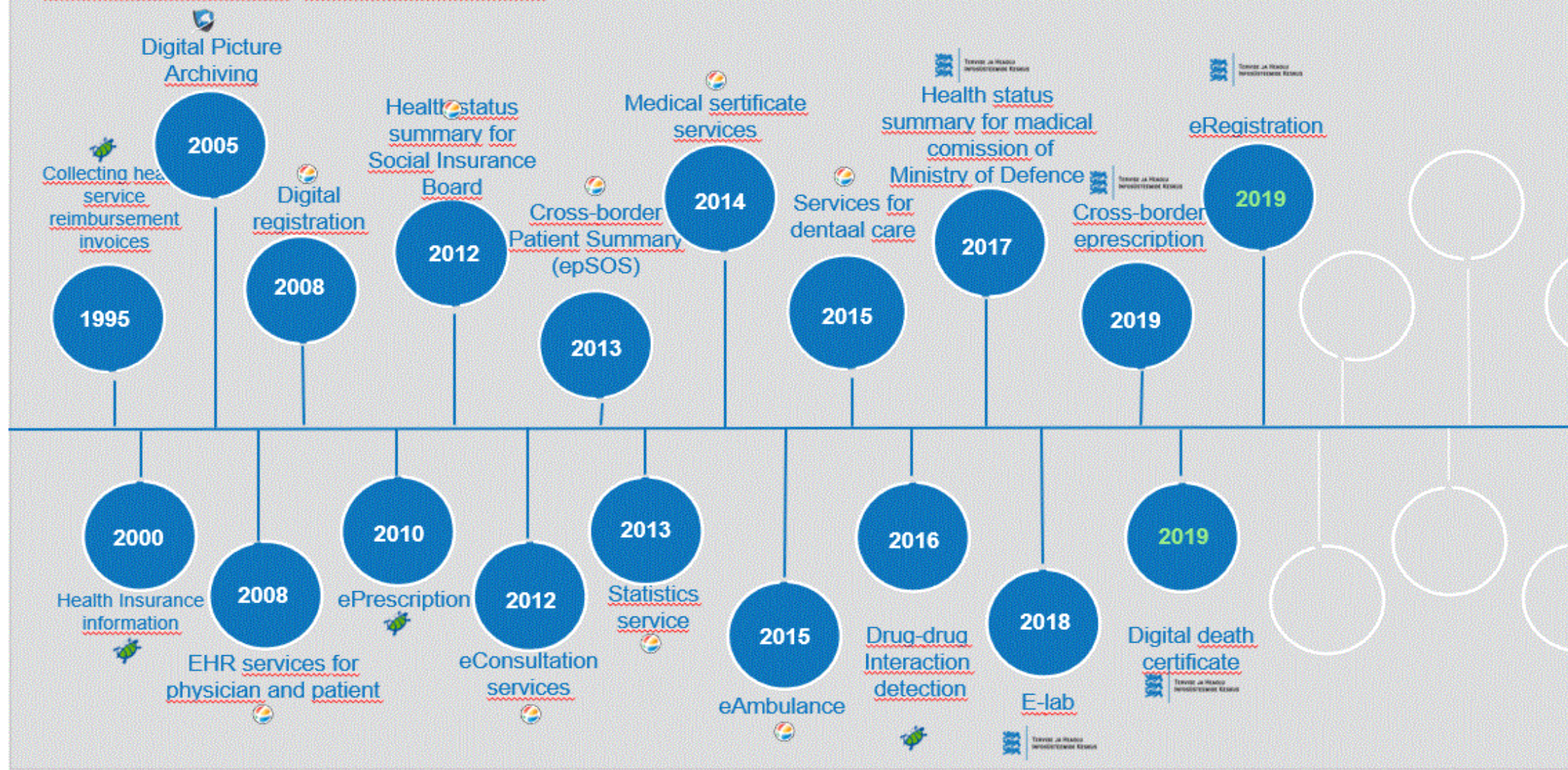
Keeping up with the developments in e-Estonia

An Overview of e-Health Services in Estonia



<https://www.youtube.com/watch?v=H4QLzQGMI3k>

E-health services



Cross Border e-Prescription

Goals:

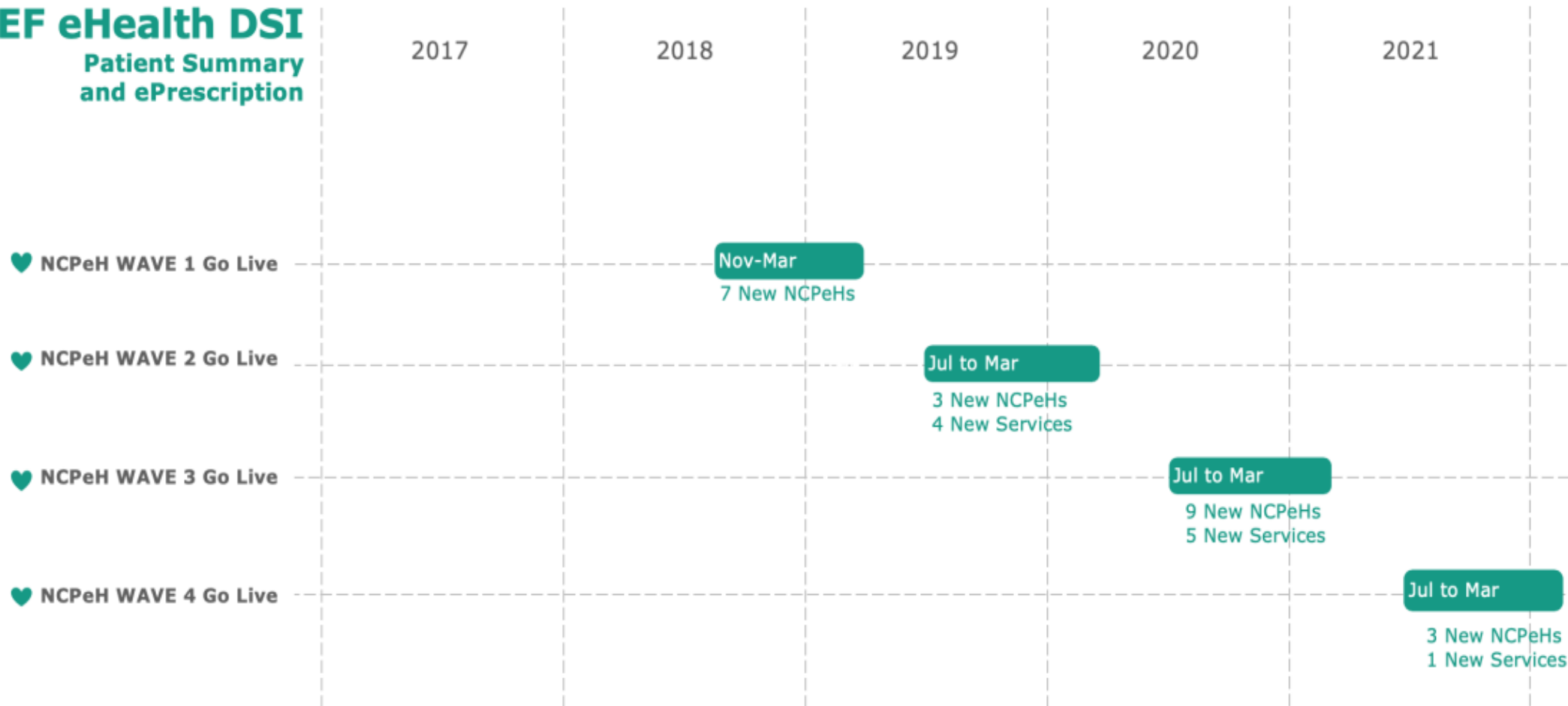
1. To guarantee that Estonian people can use Estonian e-prescriptions in other EU Member States
2. To display the prescriptions issued in foreign countries to the pharmacist in the local language
3. To guarantee more detailed data of higher quality when prescriptions are dispensed (*patient summary*)
4. To increase the sale of medicines in Estonia on the basis of prescriptions issued in foreign countries

General description

- Each country has a technical and organisational contact point through which data are exchanged
- The following is implemented in each EU Member State with funding from the CEF Programme of the European Commission and the self-financing of the states:
 - **e-Prescription** (*and e-Dispensation*)
 - **Patient summary**

Implementation schedule

CEF eHealth DSI Patient Summary and ePrescription





E-prescription first wave – slow start

- Joint declaration between Estonia and Finland on May 10, 2016

“Joint Declaration on an Initial Roadmap for Cross-border Data Exchange and Digital Services Between the Republic of Estonia and the Republic of Finland”

- Implementation under the EU framework started in 2016-2017
- At first was planned between 6 countries
- Finally only EE - FI remained for the first attempt
- Implemented only in one way FI -> EE
- Implemented by January 21, 2019 (7 months later than initially planned)
- FI <-> EE was planned to be ready within 2019 (currently on hold)
- Instead HR <-> EE

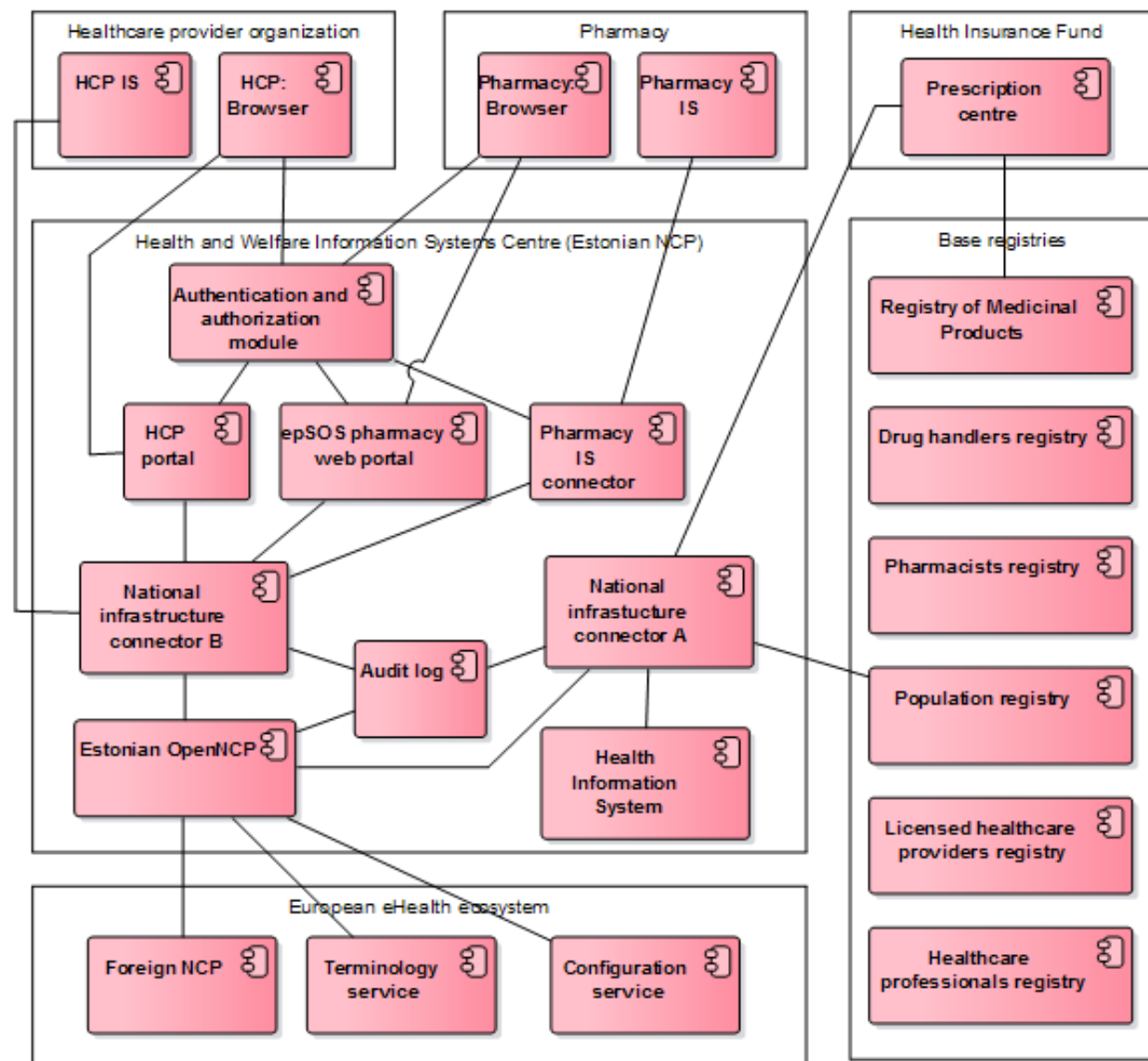
Estonia – Finland: first months of implementation, problems

- Differences between country regulations
- Differences between medicine assortment
- Differences between substitution rules
- Difficult procedure to apply for reimbursement in Finland
- Limitations on cross-border internet sales (packaging)

Cross border e-prescription solution data connection model

Complexity – implementation as difficult as initial e-Prescription in Estonia.

omp Components



Results, scope, potential

- Overall queries: 43 912
- Patient queries: 16 325
- Prescription queries: 9 326
- Prescriptions dispensed: 4 485

(Cross-border e-prescription system implementation, January – September 2019)

| Estonia | Finland |
|--|---|
| Population 1,3 million | Population 5,6 million |
| Estonians' visits to Finland (2018) 647 000 | Finnish visits to Estonia (2018) 2 000 000 |

Doubling Estonian
retail market ... ? 😊

A practical chance to combine cross-border e-prescription, patient health data, online medicines sales and telemedicine services in 2020?



Estonian e-Healthcare ecosystem in general



IT tools in dispensing and counselling of medicines in Apotheke

1. Multi-dose dispensing
2. Online pharmacy
3. Repeat prescription service
4. Video pharmacist
5. E-pharmacist
6. Automated storage system



Apotheka – the most innovative pharmacy chain in the Baltics

- Widely known pharmacy chain covering all Baltic countries
- 1000+ employees
- Number of pharmacies 300+

Apotheka in Estonia

- 600+ employees
- Number of pharmacies 172
- Annual turnover EUR +100 million
- +700 000 membership cards
- First online pharmacy in Estonia
- +1 million online visitors annually



The oldest pharmacy in EU – Apotheka Revali Raeapteek

- Established by German physician Johan Molner in 1422.
- Always operated in the same place.
- Special marzipan that cures lovesickness.
- Celebrated the 597th birthday of the pharmacy in autumn



1. Multi-dose dispensing

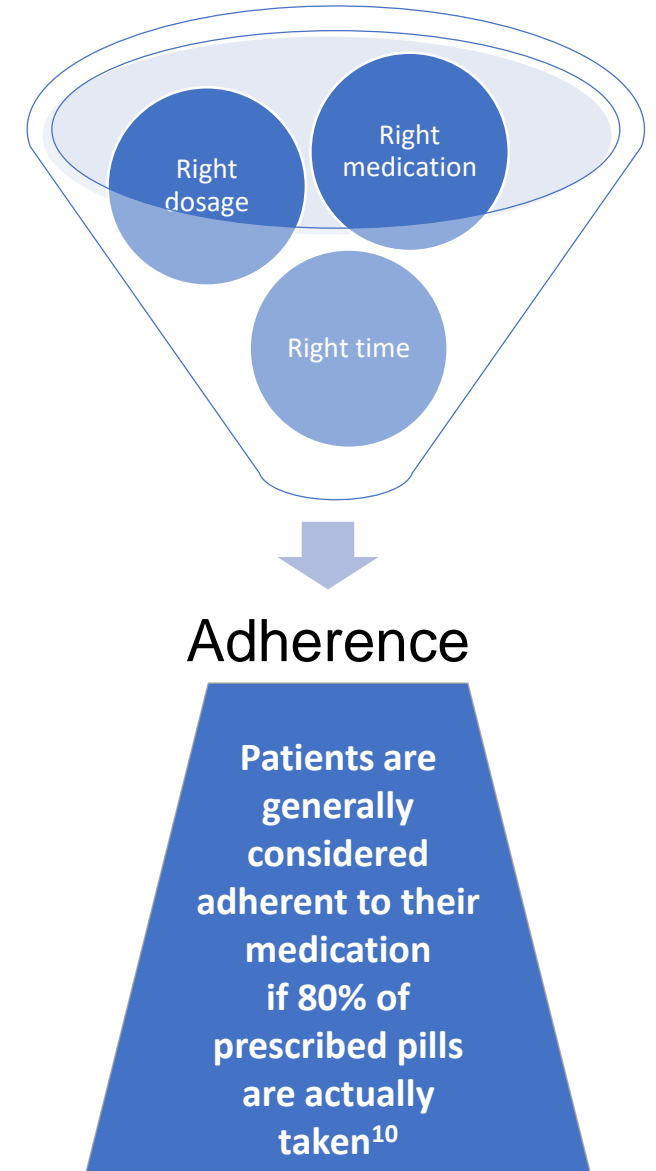
The problem?

- Poor medication adherence as one of the most critical problems of modern healthcare
- Polypharmacy among the elderly

Adherence statistics in Estonian shows that (2011)

- 80-85% of prescribed medication is actually purchased
- 65% of patients with chronic diseases fill all their prescriptions

Only 5% of elderly patients with a complex drug regimen achieve a pill count of over 80% with all their medication²



Effects of poor adherence

- 4-10% of all emergency department visits are caused by adverse drug events ^{3,4}
- It is estimated that over 5% of all healthcare expenses can be saved by improving adherence,⁷ while among some groups of patients savings over 50% are likely¹¹
- Among the elderly up to 25% of all hospital admissions are related to a drug-related problem (DRP), most of which are considered to be avoidable^{12,13}
- Medicines that are returned to pharmacies have been found to be about 2-5% of the volume dispensed⁸

“Drugs don’t work in patients who don’t take them”

Charles Everett Koop (US Surgeon General 1982-1989)

Treatment plan from the nursing home

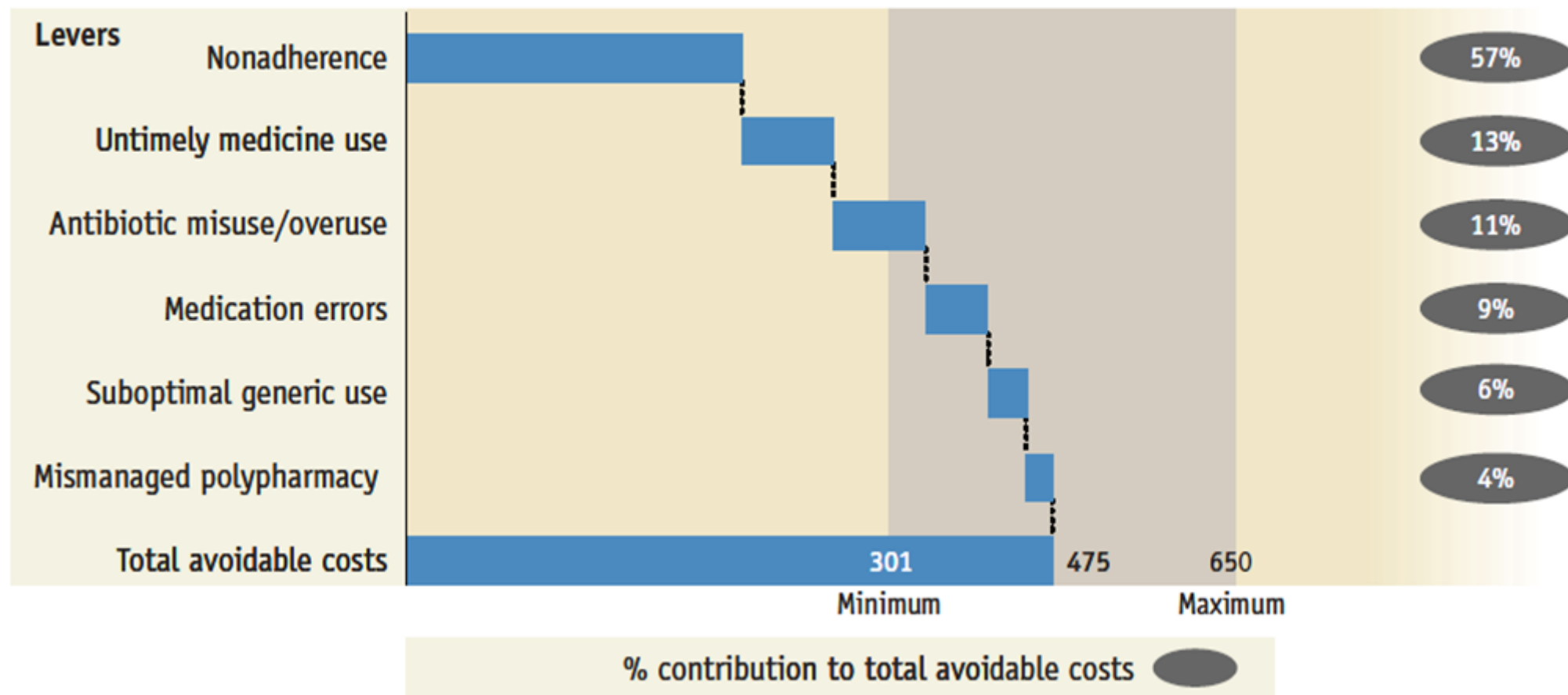
before

1. Allopurinol 300 mg 1x (H)
2. Amlodipin 10 mg 1x (H)
3. Atorvastatin 10 mg 1x (Õ)
4. Duloksetiin 60 mg 1x (H)
5. Apiksabaan 2.5 mg 2xp (H, Õ)
6. Furosemiid 40 mg 1.5 tbl (H)
7. Kvetiapiin 25 mg 1x (Ö)
8. Metoprolol 50 mg 1x (H)
9. Pantoprasool 40 mg 1x (H)
10. Ramipriil 2.5 mg 1x (H)

after

1. Allopurinol 300 mg 1x (H)
2. ~~Amlodipin 10 mg 1x (H) – TÜHISTATUD~~
3. Atorvastatin 10 mg 1x (Õ)
4. Duloksetiin 30 mg 1x (Õ) - PARANDATUD
5. Apiksabaan 2.5 mg 2xp (H, Õ)
6. ~~Furosemiid 40 mg 1.5 tbl (H) – TÜHISTATUD~~
7. Torasemiid 10 mg 1xp (H) – LISATUD
8. Kvetiapiin 25 mg 1x (Ö)
9. Metoprolol 50 mg 1x (H)
10. ~~Pantoprasool 40 mg 1x (H) – TÜHISTATUD~~
11. ~~Ramipriil 2.5 mg 1x (H) – TÜHISTATUD~~
12. Telmisartaan 40 mg 1x (H) – LISATUD

Estimated avoidable costs from suboptimal use of medicines
 USD Billion, Worldwide (2011)



Barriers to medication adherence are complex and varied, therefore a systematic solution is needed

Solution?

The **Apotheka pharmaceutical care program** is a patient-centred service that combines

1. Medication use review (*MUR*)
2. Administration aids (*MDD*)
3. Continuous support and counselling by the pharmacist



Medication use review (MUR)

Do you sometimes forget to ask for a prescription?

How do you take your medication?

Are you drinking grapefruit juice?

Do you sometimes forget to take your medication?

Do you take additional food supplements?

Are you taking *Hypericum*?

Do you know which medication can be taken together?



MDD - how does it work?



Outcomes for the patient

- Improved treatment results and quality of life
- Reduced risk of ADE's
- Potential savings due to less waste of medicines
- Improved communication with the pharmacist
- Simple and safe way of managing complex drug regimens
- Improved self-management compliance among elderly

Outcomes for the pharmacist

- Possibility to offer advice and counseling regarding the whole medication regimen, not a single prescription
- Possibility to have a greater positive impact on the treatment outcome
- Possibility to influence the role and responsibility of pharmacists in primary care

Outcomes for the healthcare system

- Improved treatment outcomes and longer life expectancy
- Reduction of drug related problems
- Significant reduction of total healthcare costs
- Time savings for doctors, nurses, caregivers ...
- Possible reduction of medication expenses
 - Less waste
 - Rational use of drugs
 - Use of bulk packaging
 - Increased generic substitution

2. Online pharmacy

- The right to sell medicines from a distance is approved by the State Agency of Medicines on the authorisation of the pharmacy.
- There are two authorised online pharmacies in Estonia at present
- The sale of prescription medicines from a distance is permitted and the presence of a well-functioning e-prescription solution is a precondition for this.

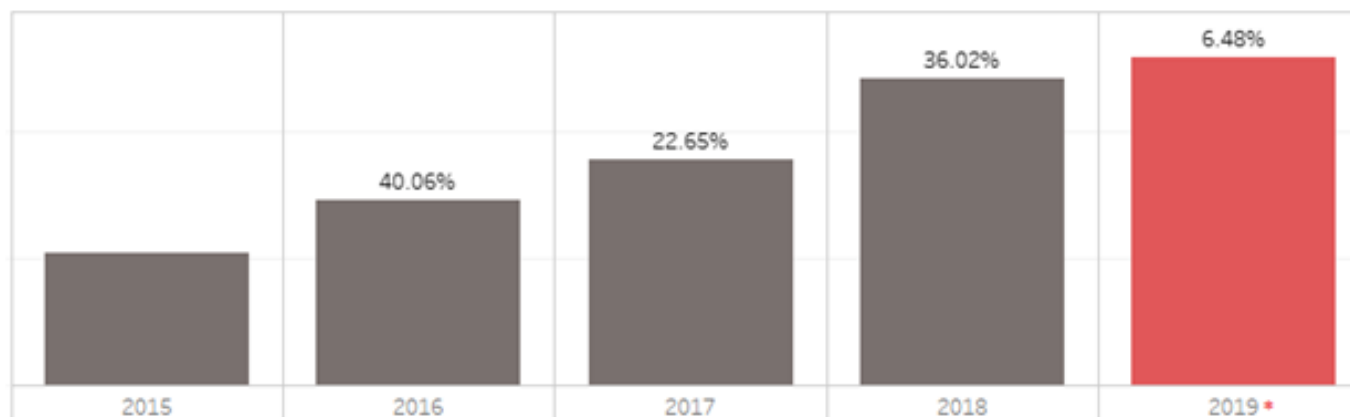


Klõpsake siia,
et kontrollida,
kas käesolev
veebisait töötab
seaduslikult

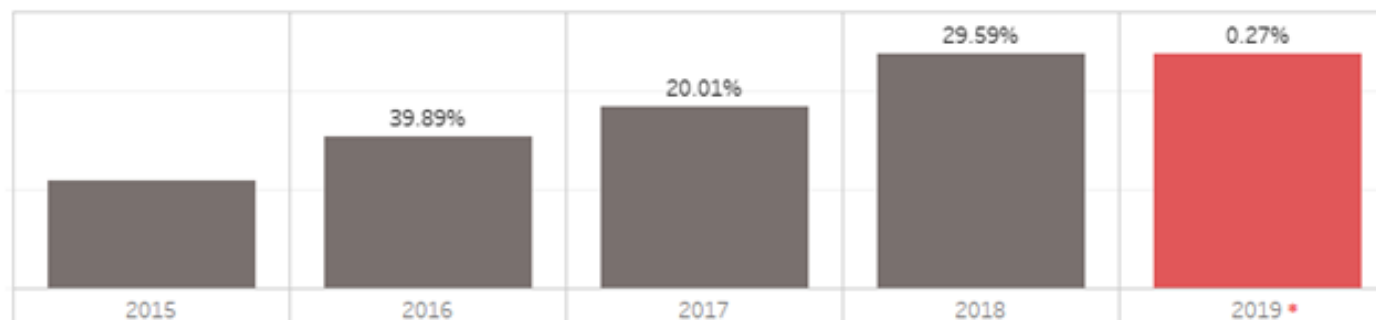


Online is taking over ...

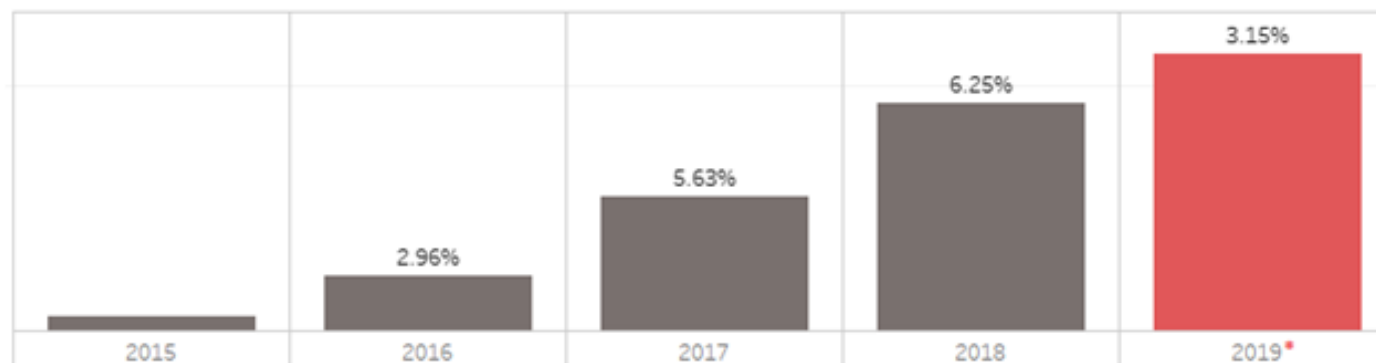
Net revenue



Number of purchases



Amount of different products purchased



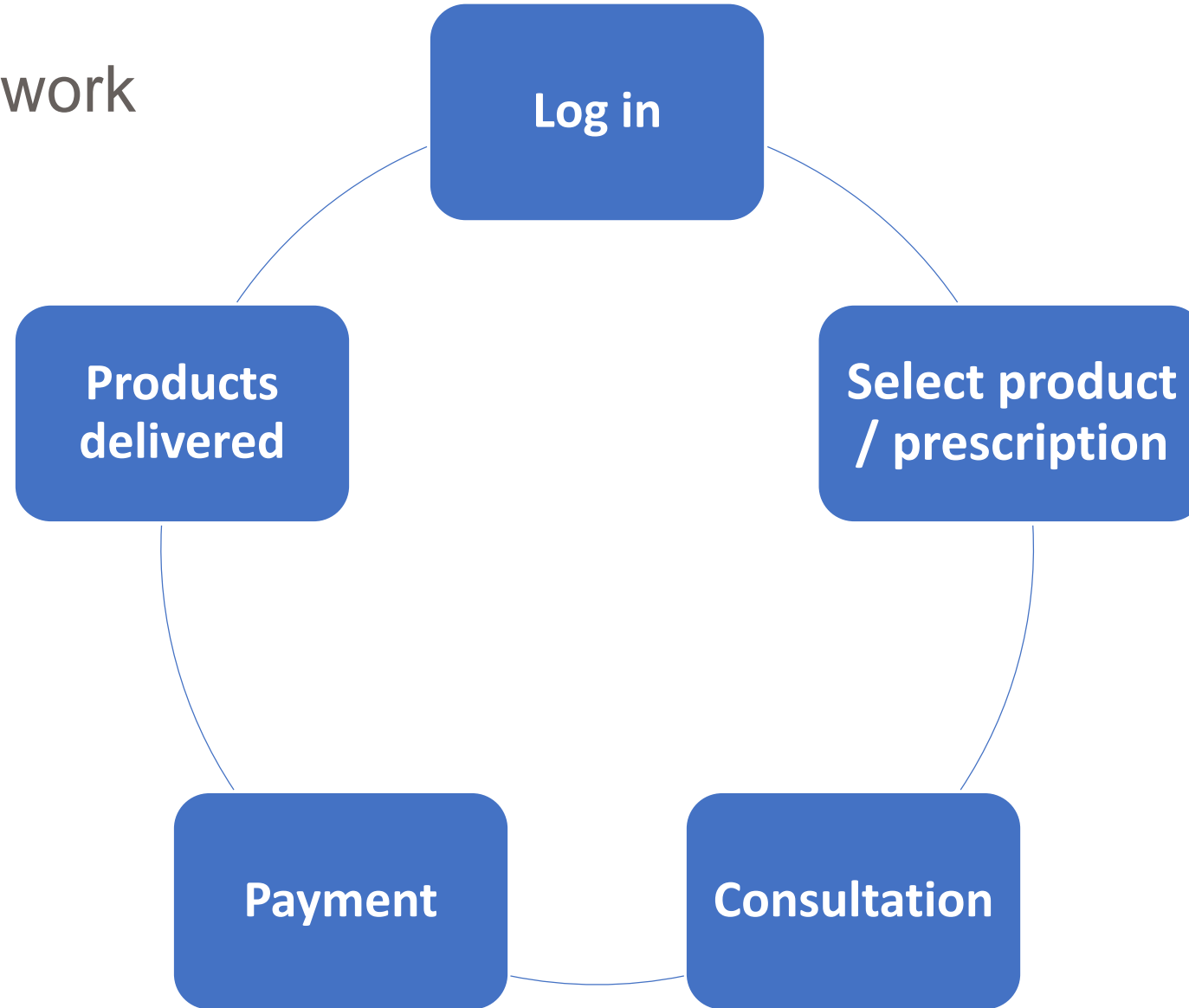
2019* - data based on 10 months

What can you buy in online pharmacies?

- OTC medicines
- prescription medicines on the basis of e-prescriptions
 - excluding narcotic and psychotropic medicines and anabolic steroids
- veterinary medicines sold OTC
- health products, pharmacy cosmetics, medical equipment, etc.

- A pharmacist communicates with the client and helps them choose medicines and other pharmacy goods, and gives them health information
- The activities of pharmacies are supervised by the State Agency of Medicines
- Medicines are not bought back (only for destruction)

How does it work



Added value of online pharmacy

Pharmacy service

- Instant access to pharmacist – real-time counselling about medicines and health related questions by pharmacists
- Ordering for other people – it is possible to have medicines ordered on behalf of another person, e.g. one who doesn't have the Internet, and have them delivered to their home
- Transport throughout Estonia – accessibility will improve, especially when there is no pharmacy nearby or difficulty in movement
- Broad selection – unlike ordinary pharmacies, the product selection is not restricted by the size of the pharmacy
- Counselling history – the history is saved and it's always possible to return to it

An online pharmacy makes it possible for many people with special needs and disabilities to use the pharmacy service independently!

Convenience service

- No queue – fast and convenient, there is time to read about and select the pharmacy goods
- Veterinary products – it is also possible to buy medicines (OTC!) , grooming products, etc. for pets
- Sensitive purchases – uncomfortable/embarrassing purchases
- Special offers + gifts
- Bulky goods
- Accessibility of medicines – broad selection (8000+ SKUs)



3. Repeat prescription service

- Combined with the online pharmacy
- The pharmacist contacts the GP
- Prescriptions for chronic, long term illnesses, contraceptives
- Goal: to contribute to better medication adherence
- Focus: personal approach to patient, convenient and professional counselling
- Requires cooperation between the parties

- The IT developments are ongoing.

“80-85% of prescribed medication is actually purchased”

“65% of patients with chronic diseases fill all their prescriptions”

Source: National Audit Office (2012). Organisation of compensation of medicines



“It’s a big task to change an industry model that essentially hasn’t moved that much in 300 years, but I’ll rest when I can look back and can say the health sector is better because of what we have added to it”

Pharmacy2U CEO, Mark Livingstone

4. Video pharmacist

- Implementation in the first pharmacy January 2018
- Currently actively used in 2 pharmacies
- Pharmacist-patient communication via video conference



Three parties are involved in the process:

The video pharmacist (VP)

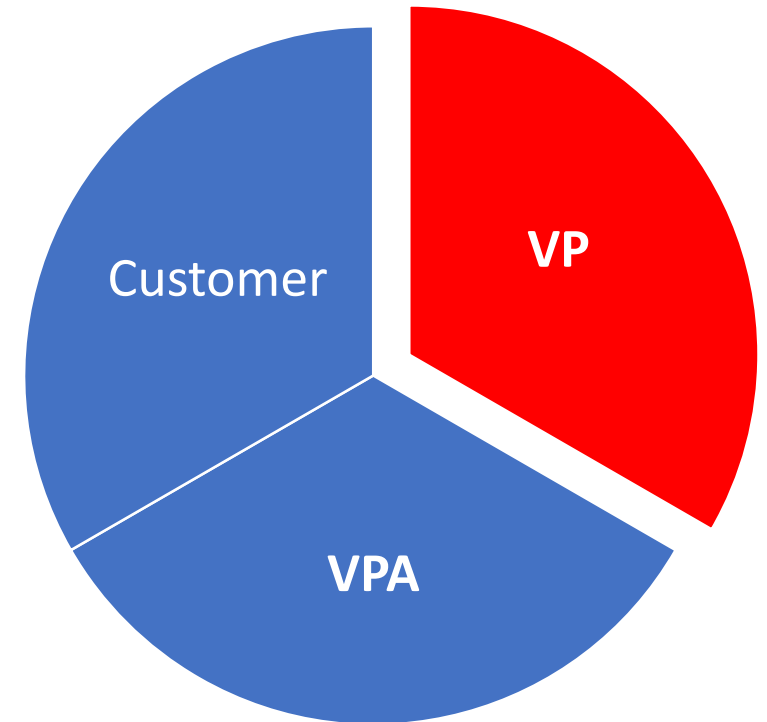
- counsels the customer via video conference
- physically located in another pharmacy

The video pharmacist assistant (VPA)

- chooses the goods based on the given instructions
- passes the goods to the customer after VP confirmation

The customer

- contacts the VP via video conference
- can purchase goods from the pharmacy



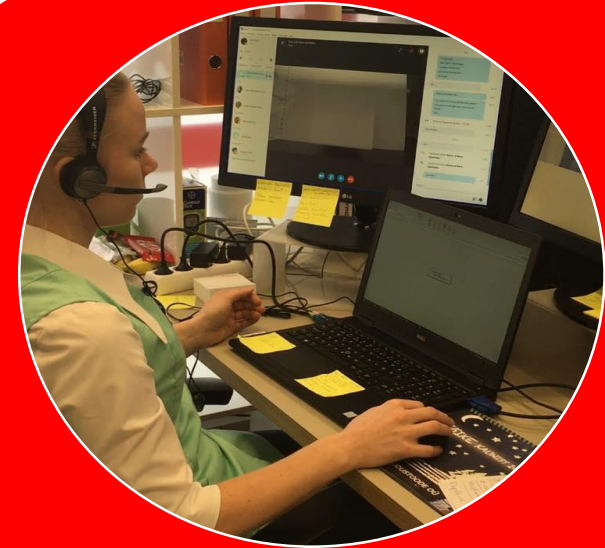
3 stations



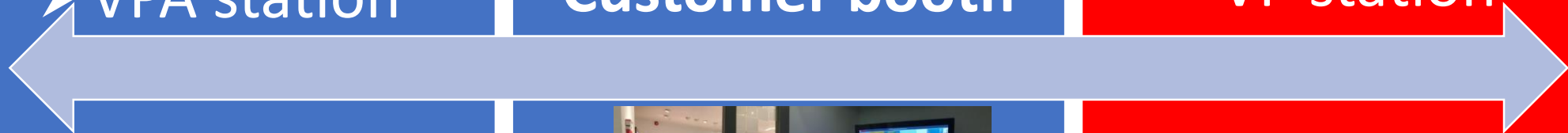
➤ VPA station

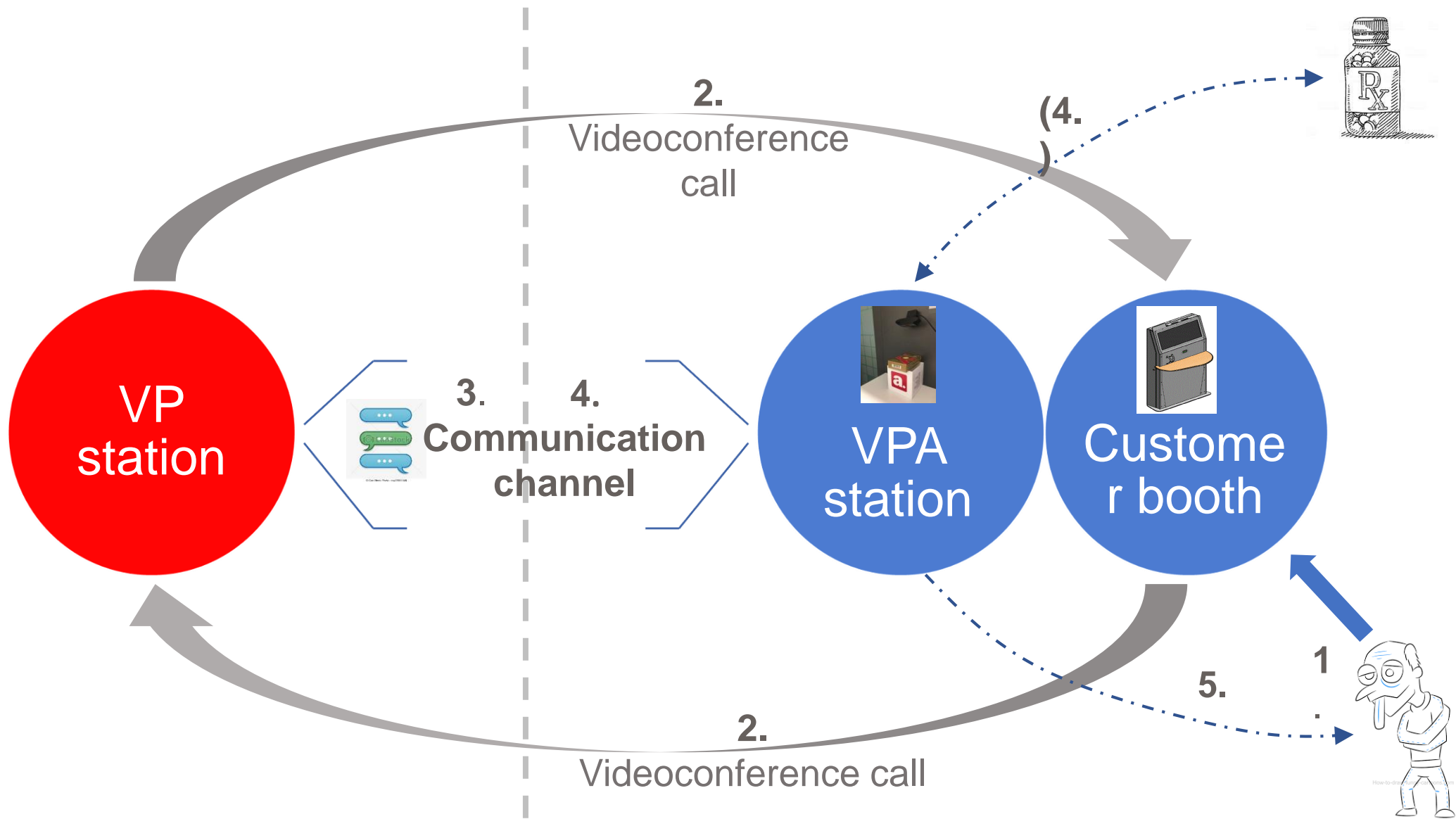


Customer booth



VP station





Pharmacy 2

Pharmacy 1

Advantages for the customer:

- Reduction of waiting time
- Possibility to have more private consultation with pharmacist
- (In rural areas - accessibility to primary care)

At this point - average 10 customers per day (max over 20 per day).

To move pharmacists away from dispensing drugs and the associated administrative tasks is to optimise the use of IT solution **to strengthen** – not to undermine! – **pharmacy service.**

5. E-pharmacist

- Apotheke's 'helper' since summer 2018
- A tool for professional pharmacists, which makes it possible to counsel patients better
- Gathers the information needed by pharmacists and patients
- Everyday tool for pharmacists that forms a whole with the pharmacy software

- Number of medicines in E-pharmacist: all the medicines authorised by the Register of Medicinal Products
- Drug-drug, drug-food supplement interactions
- Pharmacokinetic interactions
- Conflicts and warnings:
 - Pharmacists
 - Inxbase
 - Pharmacy software provider
- Over 20,000 drug interactions
- Warnings classified according to clinical significance (C-D)

NOOM 1.1.489

Login Aknad Admin System

Müük LV.5

Müük

F1=Hidp F2=Vali F3=Raha sisse F4=Raha välja F5=Laud F6=Kopeeri F7=Kaal F8=Vah. lõpp
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Digiresept Digiresept [F1] Isikukood ID Kaart KJKaart eProvisor Kustuta kii kaart Trüki retsept

Sisesta Nimetus

Nimelisa Kogus Hind Summa

Vimane tagasi Vaetus G00000005 Kogusumma 0,00 Maksta 0,00

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a. Alusta otsinguga siit

TEATED

22 SEP Muutused humaanravimite registris augustis [Loen lähemalt](#)

22 SEP Isoptin retard 120 mg toimeainet prolongeeritud vabastavate tablettide (toimeaine verapamiil) 100 tabletti sisaldava pakendi tamerakused kestavad oktoobri lõpuni.

22 SEP Sandoz lõpetab Mofenstra 4 mg ja 5 mg närimistablettide ja Mofenstra 10 mg õhukese polümeerikattega tablettide (toimeaine montelukast) turustamise lõpetamisest Eestis. [Loen lähemalt](#)

[Lisa uus teade](#)

TOOTEUUDISED

22 SEP **Aeguv Prostan Quattro**
 Annan teada, et oktoobri aegumisega Prostan Quattrole kompenseerib tootja 9 eurot toote hinnast. Palun tehke... [Loen lähemalt](#)

22 SEP **Hinnamuutus-Tolura**
 Alates 22.09.2015 muutuvad hinnad: TOLURA TBL 40MG N56 uus OH - 3,91 uus... [Loen lähemalt](#)

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Login Aknad Admin System

Müük LV.5

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Sisesta Nimetus

PAXELADINE SIIRUP 2MG/ML 125ML

Nimela Kogus 1 Hind 4,30 Summa 4,30

Vimane tagasi PAXELADINE SIIR 4,30 Kokku 4,30
 Vaetus G00000005 Kogusumma 4,30 Maksta 4,30

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R03DA04 teotullin astma ravim

a. Alusta otsinguga siit

PAXELADINE

Kasutatakse kuiva ja valuliku kõha raviks.

Koostis: okseladiin
Toimeainekogused: 2MG/ML
Tootevorm siirup
Sisaldab laktoosi: ei

ELUTARKUS

- Mitte kasutada lahtise kõha puhul
- Ravikuur peab olema lühike - kuni mõni päev
- Kui kõha ei allu selle aja jooksul ravile, tuleb uurida kõha põhjust ja iseloomu
- Seda ravimit ei tohi kombineerida rögalahustitega

ANNUSTAMINE


| | |
|-----------|-------------------------|
| 15 - 20kg | 2,5 ml / 3 - 4 x päevas |
| 21 - 30kg | 5 ml / 2 - 3 x päevas |
| 31 - 50kg | 5 ml / 3 - 5 x päevas |
| 51kg+ | 5 ml / kuni 5 x päevas |

Pakend sisaldab mõõtelusikat. Mitte kasutada alla 30.elukuu

MANUSTAMINE

- Manustada suukaudselt
- Annustada iga 4 tunni järel

KEELUD



HAIGUSED, MILLEGA KOKKU EI SOBI

NOOM 1.1.489

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Müük

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 Digiresept Digiresept [F1] Isikukood ID Kaart KIKaart eProvvisor Kustuta kii kaart Trüki retsept

Sisesta Nimetus

COLDREX MAXGRIP MENTHOL _BERRIES 1000+10+70MG N10

Nimelis Kogus 1 Hind 5,98 Summa 5,98

Vahetus G00000005 Kogusumma 10,28 Maksta 10,28

Vimane tagasi COLDREX MAXGRIP 5,98
Kokku 10,28

| Nr | Otsikood | Partii | Nimetus | Kogus | Hind | Summa | Soo | Diaagnoos | Retsepti nr. | Tingimus | Arst | Isikukood | Retsepti kp. | Kehtivus |
|----|----------|-----------|--|-------|------|-------|-----|-----------|--------------|----------|------|-----------|--------------|----------|
| 1 | R05DB0 | H01351003 | PAXELADINE SIIRUP 2MG/ML 125ML | 1 | 4,30 | 4,30 | | | | | | | | |
| 2 | N02BE8 | 402500457 | COLDREX MAXGRIP MENTHOL & BERRIES 1000+10+70MG | 1 | 5,98 | 5,98 | | | | | | | | |
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R03DA04 teotullin astma ravim

a. Alusta otsinguga siit

COLDREX MAXGRIP MENTHOL & BERRIES

Valuvaigistava, palavikku alandava ja hingamist kergendava toimega ravim, mida kasutatakse palaviku alandamiseks, nõrga valu leevendamiseks ja nohu raviks.

Koostis: paratsetamool, fenüülefriin, askorbiinhape
Toimeainekogused: 1000+10+70MG
Tootevorm suukaudse lahuse pulber
Sisaldab laktoosi: ei
Maitse: marjamaitseline

ELUTARKUS

- Coldrex Maxgripi ei tohi tarvitada inimesed, kellel on probleemid südamega või kõrgenenud vererõhk
- Samaaegselt Coldrexiga ei peaks kasutama teisi paratsetamooli sisaldavaid ravimeid
- Samuti ei tohi koos kasutada teiste ravimitega, mis on mõeldud gripi või ninakinnisuse leevendamiseks
- Ravi ajal ei tohi tarvitada alkoholi ning naistepuna

ANNUSTAMINE

12a+ 1 pakike / iga 4 - 6 tunni järel

MANUSTAMINE

- Segada hoolikalt
- Lahustada pooles klaasis kuumas vees
- Vajadusel võib lisada külma vett
- Ravimit tohib kasutada maksimaalselt 7 päeva

KEELUD

NOOM 1.1.489

Login Aknad Admin System

Müük LV.5

Müük

F1=Hdp F2=Vali F3=Raha sisse F4=Raha välja F5=Lauad F6=Kopeeri F7=Kad F8=Vah. lõpp
 F9=Lõpp F10=Print F11=Ribak. F12=Sahtel * =Kogus Enter=Otsi Toimingud Klaviatuur

Digiresept Digiresept [F1] Isikukood ID Kaart KIKaart eProvvisor Kustuta kiikaart Trüki retsept

Sisesta Nimetus

IBUMETIN TBL 400MG N30

Nimela Kogus 1 Hind 4,35 Summa 4,35

Vimane tagasi IBUMETIN TBL 40 4,35
Kokku 13,98

Vahetus G00000005 Kogusumma 14,63 Maksta 13,98

| Nr | Otsikood | Partii | Nimetus | Koqus | Hind | Summa | Soo | Diagnoos | Retsepti nr. | Tingimus | Arst | Isikukood | Retsepti kp. | Kehtivus |
|----|----------|------------|--|-------|------|-------|-----|----------|--------------|----------|------|-----------|--------------|----------|
| 1 | R05DB0 | H013510032 | PAXELADINE SIIRUP 2MG/ML 125ML | 1 | 4,30 | 4,30 | | | | | | | | |
| 2 | N02BE8 | 402500457 | COLDREX MAXGRIP MENTHOL & BERRIES 1000+10+70lv | 1 | 5,98 | 5,98 | | | | | | | | |
| 3 | M01AE0 | 1112966800 | IBUMETIN TBL 400MG N30 | 1 | 4,35 | 4,35 | | | | | | | | |
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R03DA04 teotullin astma ravim

a. Alusta otsinguga siit

IBUMETIN

Valuvaigistav ja põletikuvastane ravim. Kasutatakse nõrga kuni mõõduka valu, valuliku menstruatsiooni ja palaviku, samuti reumaatiliste haiguste korral.

200MG
Poolitusjoon puudub

400MG
Poolitusjoon on annuse jagamiseks

600MG
Poolitusjoon on annuse jagamiseks

Koostis: ibuprofeen
Toimeainekogused: 200MG | 400MG | 600MG
Tootevorm õhukese polümeerikattega tablett

RAVIM ON KONFLIKTIS

- Ravimit ei tohi tarbida koos järgmiste ravimitega ravimisahhtlis: Coldrex Maxgrip Menthol & Berries

ELUTARKUS

- Ravimi võtmisel söögi ajal väheneb maoärrituse tekke võimalus
- Ibimetin võib vahel tõsta naha tundlikkust päikesevalgusele
- Kuna ibuprofeen võib tõsta südamelihaseinfarkti või insuldi tekkeriski, tuleb ravimit kasutada võimalikult lühikest aega minimaalses efektiivses annuses

ANNUSTAMINE

200MG

| | | |
|----------|--------------------------------|---|
| kuni 18a | valu, palavik (kehakaal>20 kg) | 1 tablett / 3 x päevas / max 40 mg/kg kehakaalu kohta ööpäevas |
| kuni 18a | valu, palavik (kehakaal>30 kg) | 1 - 2 tabletti / 3 x päevas / max 40 mg/kg kehakaalu kohta ööpäevas |

6. Automated storage system

- Robots are used for the provision of services in the pharmacy sector
- Automatic dispensation of medicines is increasing
- There are two pharmacy robots in Estonia at present: Robi and Pärt
- Investment is significant but necessary
- Use of robots to strengthen pharmacy service



- We believe that is right to optimize certain processes to free up time for patient facing care

Robots are helping us out ...

- Medicines gotten to the pharmacist in 7-8 seconds
- 17,000 to 18,000 packs of medicines can fit in a robot
- Gives an overview of stock, clean up after themselves!
- Rearrange goods/optimize the use of shelves during 'breaks'
- Goods are received more quickly and efficiently
 - Entry of goods at the speed of 550 packs per hour
 - Dispensation of goods at the speed of 500 packs per hour
- Reduce errors in dispensation
- Optimize the use of the pharmacy's storage room
- Security – medicines are always in the locked robot and can be accessed by authorized employees only

Pharmacists now have more free time to consult patients, while dispensing has been automated!



Conclusions

- The number of e-Health solutions in Estonia is constantly increasing.
- Pharmacies offer more services than ever before
 - e.g. assessment of the use of medicines and evaluation and/or monitoring of health risks, measuring various health indicators like blood pressure, blood sugar, cholesterol, BMI, etc., vaccination, multi drug dispensing systems, Rx renewal service ...
- All of them work well, but...

services are still provided in pharmacies are still separate from the rest of the healthcare system

- the family doctor or family nurse gets no information about the use of the services or responses, and neither do pharmacists between each other

Thus...

1. The base level for the successful implementation of IT is good in Estonian healthcare.
2. Gradual testing and constant cooperation with parties, also in the development of the pharmacy services, gives better results than the tactic of big and quick changes.
3. IT has an enormous impact on healthcare at the level of all activities and parties to the system.
4. Systematic inclusion of IT and innovative solutions to improve the provision of services also makes it possible to integrate the pharmacy service more successfully with the level of primary care.

The biggest challenge?

To integrate the pharmacy services in the existing set of e-Health system to ensure value-added patient services and care.

Result:

a sustainable healthcare system → keeping people healthy → increase of Healthy Life Years

THANK YOU!

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