keenturtle
Solutions for Medication 3.0

ParisSanté campus
AGENCE DU NUMÉRIQUE EN SANTÉ

- Advanced Data Intelligence that provide the necessary ***Data for AI***

- Advanced risk management with the ***Clinical Decision System***

PharmaClass
Secure Patient Medication

Présentation to the Norvegian Directorate for E-health and the Norvegian Centre for E-health Research

French-Norwegian E-health meet-up, Nov 23rd

francois.versini@keenturtle.com 33(0) 6 8275 3377

Disruption in Data Intelligence… for a disruption in Medication risk detection and management … and many other uses

PharmaClass
Secure Patient Medication

DRUG-RELATED IATROGENY

Real-time, relevant, personalised and contextualised alerts

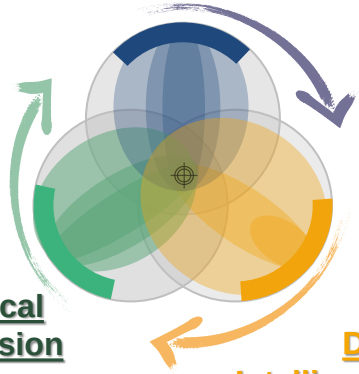
+40 hospitals/clinics in France, Belgium and Switzerland

+10000 beds

+300 000 stays / year

thousands of serious problems avoided

Multiple Digitalized Uses



Clinical Decision System brick

Data Intelligence brick

With

keenturtle

healthcare professionals benefit from :

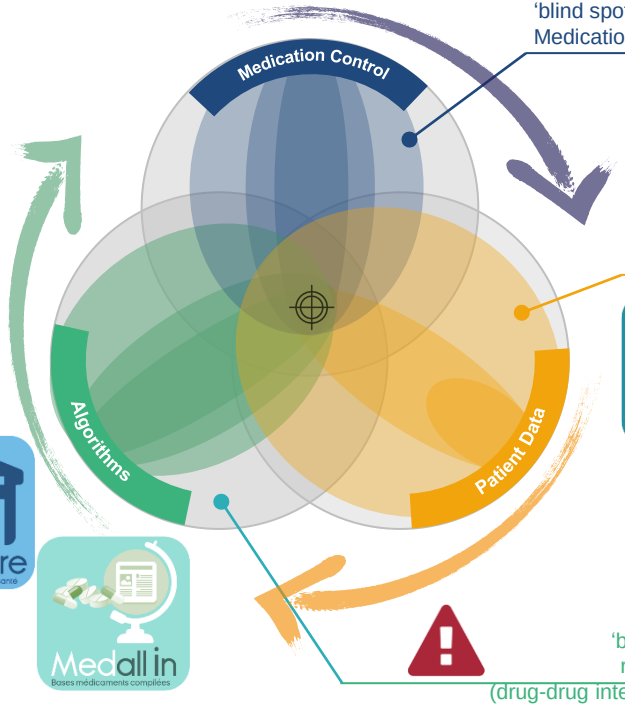
+ personalized and contextualized data,

which are exploited by + customizable algorithms

for more security and more efficiency in optimized patient care

PharmaClass

Secure Patient Medication



PharmaClass®

changes the game by empowering the pharmacist to eliminate medication errors

SmartBlend®

changes the game with interfaces and hubs capable of retrieving a large span of data, and normalizing it

RuleStore®, MedAllIn®

changes the game with more complete and up-to-date information more sensitive, specific rules

GHT Sud Lorraine

EAHP

PHARMACEUTICAL ALGORITHMS TARGETING ANTITHROMBOTIC THERAPY: IMPACT OF A CLINICAL DECISION SUPPORT IN PATIENT SAFETY

PharmaClass
Clinical Decision System

eahp
european association of hospital pharmacists
making the difference in medication

Centre Hospitalier Lunéville

CHRU NANCY

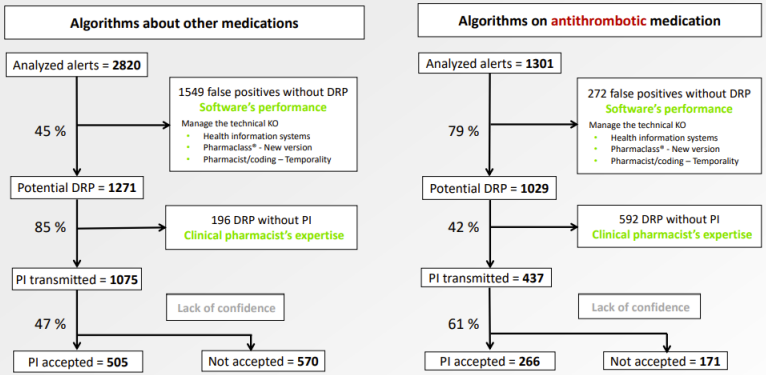
An observational prospective study has been ongoing from January 2019 to September 2020 in 2 facilities (1600 beds).

Twenty-three about 135 pharmaceutical algorithms encoded in Pharmaclass® detected patients with an antithrombotic related problem.
Guidelines structure the pharmaceutical analysis of selected DRPs analyzed from anamnesis to Pharmaceutical Interventions' transmission (PI).

- Heparin induced thrombopenia Side effect Hemorrhage Thrombosis
- Unfractionnated heparin & GFR > 30 mL/min No-compliance with standards Hemorrhage
- Unfractionnated heparin overdosing Hemorrhage
- Heparinotherapy and obesity Drug Underdosing Thromboembolic event
- Unfractionnated heparin Underdosing Thrombosis
- Low molecular weight heparin & renal insufficiency Contraindication Hemorrhage
- Low molecular weight heparin Overdosing Hemorrhage
- Prophylactic anticoagulation under Low molecular weight heparin & thin patient Overdosing Hemorrhage
- Curative anticoagulation & Intramuscular injection Inappropriate route of administration Hemorrhage
- Direct anticoagulant & renal insufficiency Contraindication Hemorrhage
- Direct anticoagulant & Heparin Contraindication Hemorrhage
- Miconazol & Direct anticoagulant Drug interaction Hemorrhage
- Xaban Drug interaction Hemorrhage
- Apixaban risk factors Overdosing Hemorrhage
- Apixaban Underdosing Thromboembolic event
- Rivaroxaban Overdosing Hemorrhage
- Dabigatran risk factors Overdosing Hemorrhage
- VKA & INR > 4.0 Overdosing Hemorrhage
- Ticagrelor or Prasugrel & Aspirin Untreated indication Thrombosis
- Anticoagulant or Antiplatelets Severe thrombopenia Contraindication Hemorrhage
- Anticoagulant and antiarrhythmic drug underdosing Inefficiency
- Heparin & VKA Drug not indicated Hemorrhage
- Direct anticoagulant & VKA Drug interaction Hemorrhage

Results

The data are collected during 260 non-consecutive days. On 4121 alerts 1301 were about anticoagulant medications (31%) and 2820 about other medications (69%). DRP detection is better performed with algorithms' on anticoagulants than with the other one (1029 [79%] vs 1271 [45%]), because of fewer technical false positives.



Pharmacist issued 437 PI targeting antithrombotic medicines of which 266 PI (61%) were accepted by physician. On the other hand 1075 transmitted PI have resulted in 505 accepted PI (47%). The difference is statistically significant ($X^2=23.99$; $p<10^{-6}$). For both of the algorithms' sets the transmission way has the same importance: for the oral way, respectively 29% vs 27% (NS). And the acceptance rate is similar with 81% and 75% respectively (NS).

PharmaClass
Secure Patient Medication

54 PATIENTS SUIVIS | 80 NOMBRE D'ALERTES | 27 ALERTES EN COURS | 1 ALERTES TRAITÉES | 52 ALERTES NON LUES

Afficher les filtres

Criticité *9/10

13/04/2017

Morphine et GFR inférieur à 15 mL par minute [MORPHINandGFR15]

[NIP00(

Surveillance d'un médicament à risque au travers de la biologie

Hôpital Universitaire Pil

00h00m00s

Analyse n°medbio_00023 du 06/04/2017
⚠ [33914-3] Filtration glomérulaire corrigée/1,73m2 calculée [Volume relatif/Temps] Sérum/Plasma ; Numérique ; Formule MDRD, Valeur mesurée 13.4

Ordonnance n°presc_1800011 du 01/04/2017
⚠ [3400921879599] MORPHINE (CHLORHYDRATE) RENAUDIN 10 MG/ML 1 BOITE DE 1, 100 ML EN POCHE, SOLUTION INJECTABLE, Présence dans la prescription

En cours de traitement

Plus de détails

Criticité *9/10

21/04/2017

Prévention de l'hyponatrémie due à d'autres antidépresseurs non spécifiés pendant leur utilisation thérapeutique Y49_2 [IATRO_Y49.2.4]

[NIP_0(

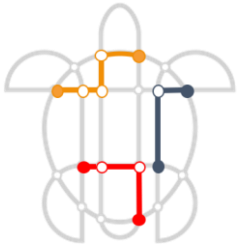
Détection d'une iatrogénie supposée

00h00m00s

⚠ Age 89 ans

Analyse n°ANAL_0029 du 01/04/2017
⚠ [2951-2] Sodium [Moles/Volume] Sérum/Plasma ; Numérique, Valeur mesurée 15.0

Ordonnance n°ORDO_0029 du 01/04/2017
⚠ [3400922394787] ESCITALOPRAM SANDOZ 5MG 1

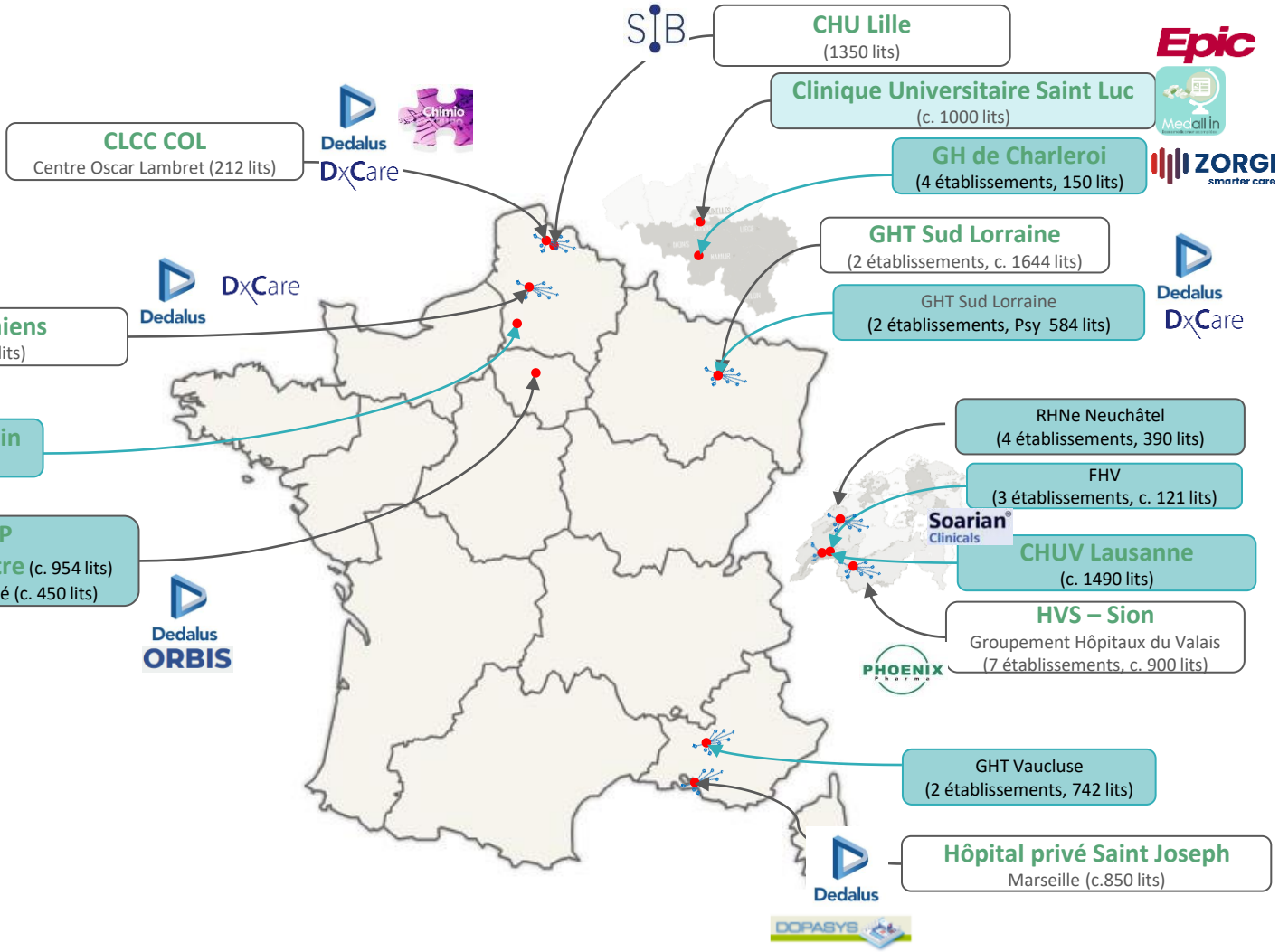


In just a few clicks, the pharmacy team receives relevant alerts, prioritized thanks to the accuracy of the data taken into account = 'Control Tower' to deal with a maximum number of risks and focus expertise on the most important risks.

PharmaClass® Implantations

40+ Etablissements

3 Pays



Keenturtle has been chosen as reference AI for pharmaceuticals in Europe,

being the only one able to be the early pilot of what will become mandatory by 2025 by the 'AI Act' due out in February 2023.

The Human Guarantee principle of AI and digital health, introduced and carried by Ethik-IA since 2017, has been recognized in France in the CCNE texts 129 and 130 and in Article 17 of the Bioethics Law.

This methodology of the Human Guarantee has been included in the draft **regulation on AI of the European Commission** in articles 14 and 29, which should be **voted in February 2023, for application within two years**.

The resulting AI Human Guarantee principle will require all users and developers of AI solutions in health to:

- The implementation of **prior information to the patient** on the use of AI in his or her care;
- The deployment of a **human supervision** of the AI solution "in real life" in conditions of traceability implemented under the control and supervision of the institutions of each country, in particular the CNIL and the HAS in France.

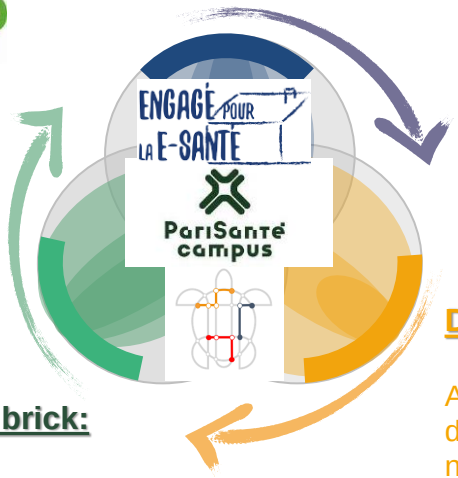
Keenturtle at PariSanté Campus

Digitizing according to the new possibilities

Multiple Digitalized Uses :

Tooling of a specific process: Pharmaceutical Analysis in the hospital
City-hospital territory perspective (EHPAD, Officines, MonEspaceSanté, ...)
...
Provision of these 'bricks' to the innovations supported

- by PariSanté campus
- in Health system in France, Belgium, Switzerland
- In synergy with eahp european association of hospital pharmacists
- And in Norway ?



➢ **A French champion of AI in Health**

➢ **Leveraging the eHealth ecosystem**

CDS brick:

A unique body of science to systematically detect and parameterize according to the targeted policies

Data Intelligence brick:

A patient profile and a use of standards without equivalent: collection of data made usable within the hospital and then on the city-hospital territory

HL7 FHIR SNOMED CT The global language of healthcare LOINC

keenturtle
Solutions for Medication 3.0

ParisSanté campus
AGENCE DU NUMÉRIQUE EN SANTÉ

- Advanced Data Intelligence that provide the necessary ***Data for AI***

- Advanced risk management with the ***Clinical Decision System***

PharmaClass
Secure Patient Medication

Présentation to the Norvegian Directorate for E-health and the Norvegian Centre for E-health Research

French-Norwegian E-health meet-up, Nov 23rd

francois.versini@keenturtle.com 33(0) 6 8275 3377