



**EMR is NOT paper on screen !
Optimizing Medical Information
presentation,
a better data display leads to a better
interaction between the user and the
medical record**

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Dedalus



Medical records

Are used to record information about patients to:

- Assure continuity of care
- Review the course of treatment
- Transfer information to other practitioners

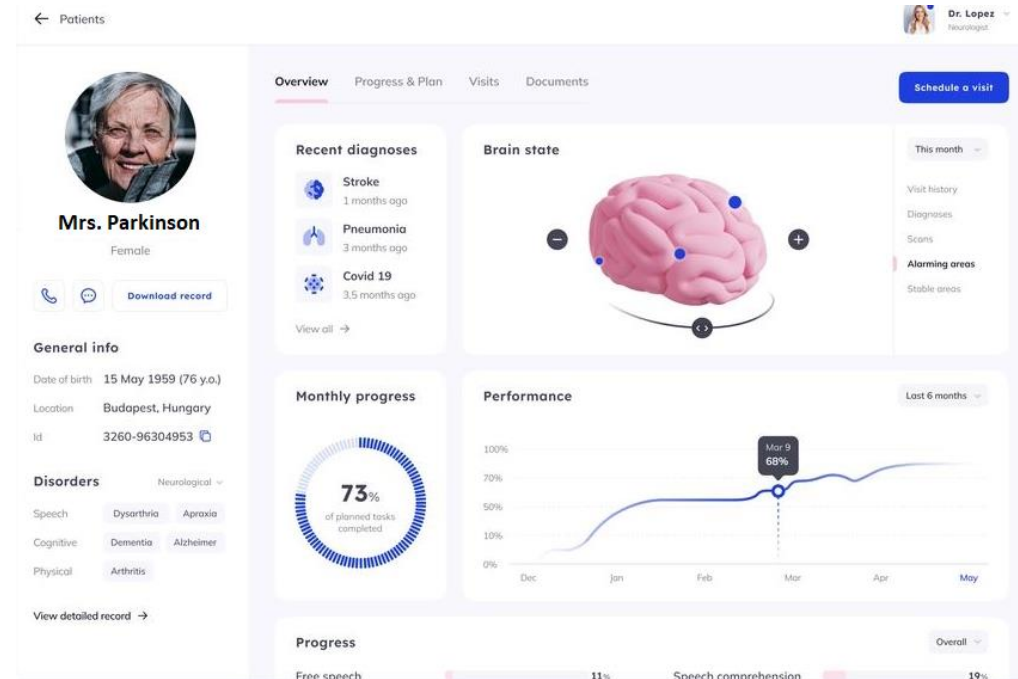


Paper based record



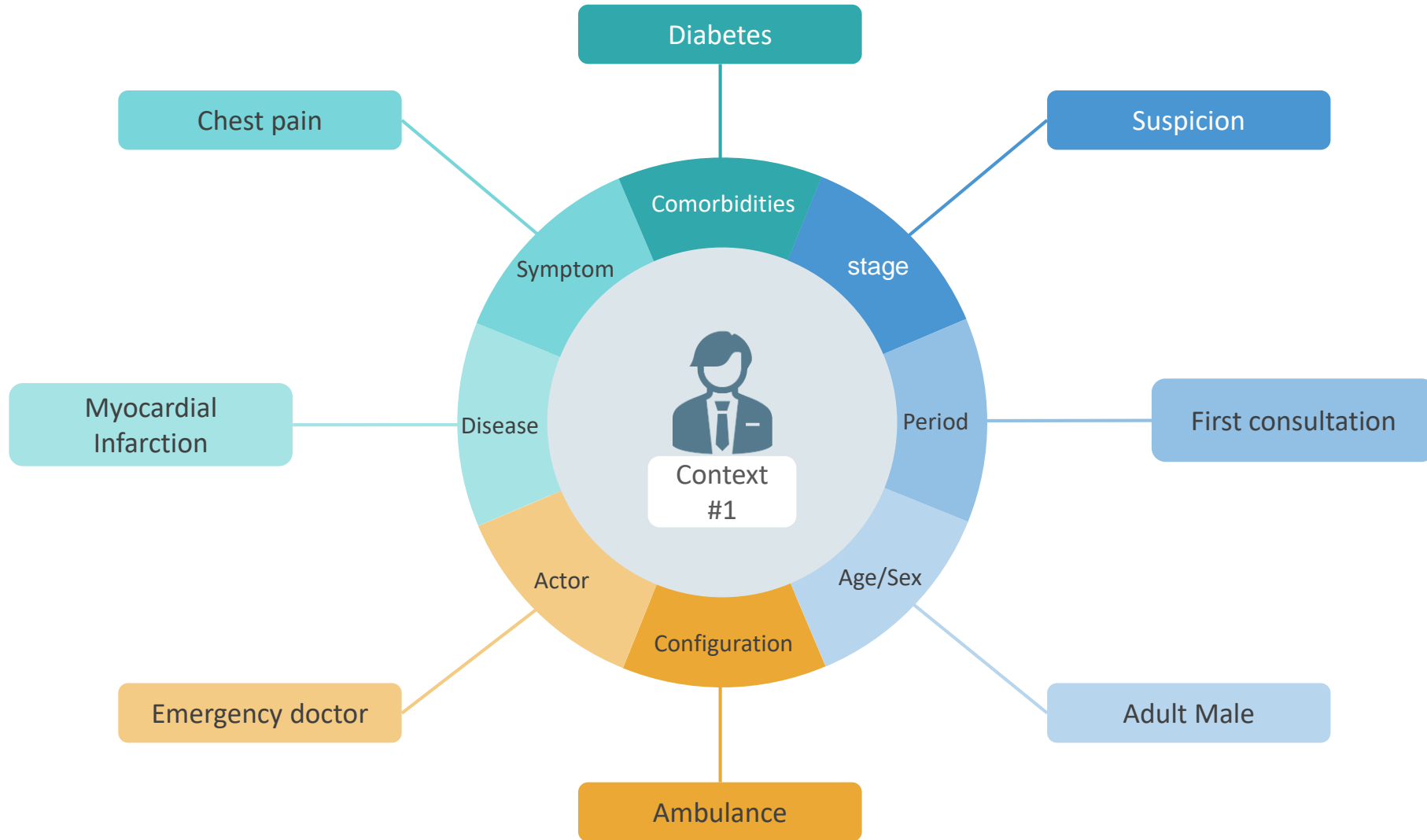
The information presentation remains the same regardless of the clinical context

A dynamic digital record providing dashboards according to **the clinical context**

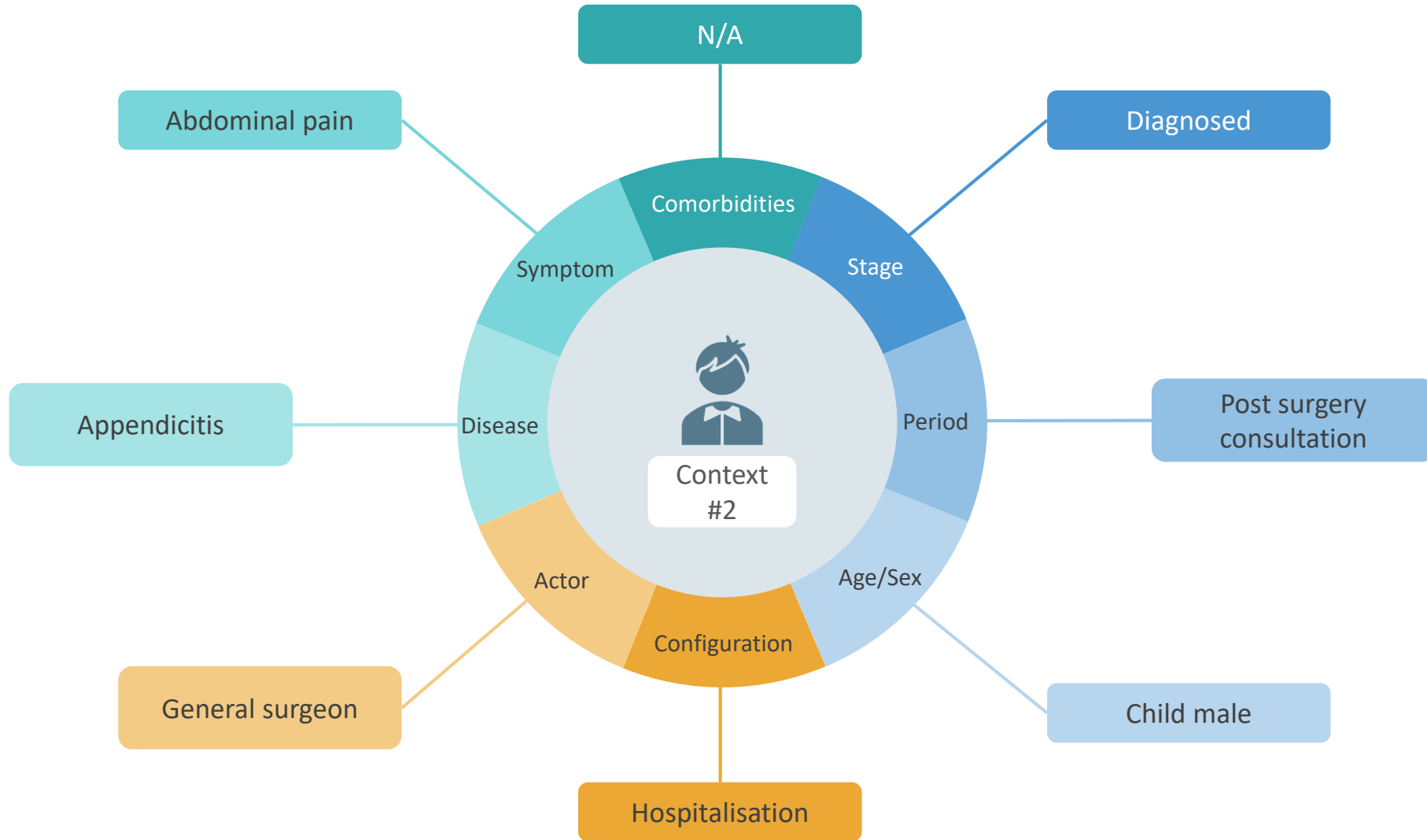


Facilitates access to the relevant clinical information in a fraction of a second and at the point of care

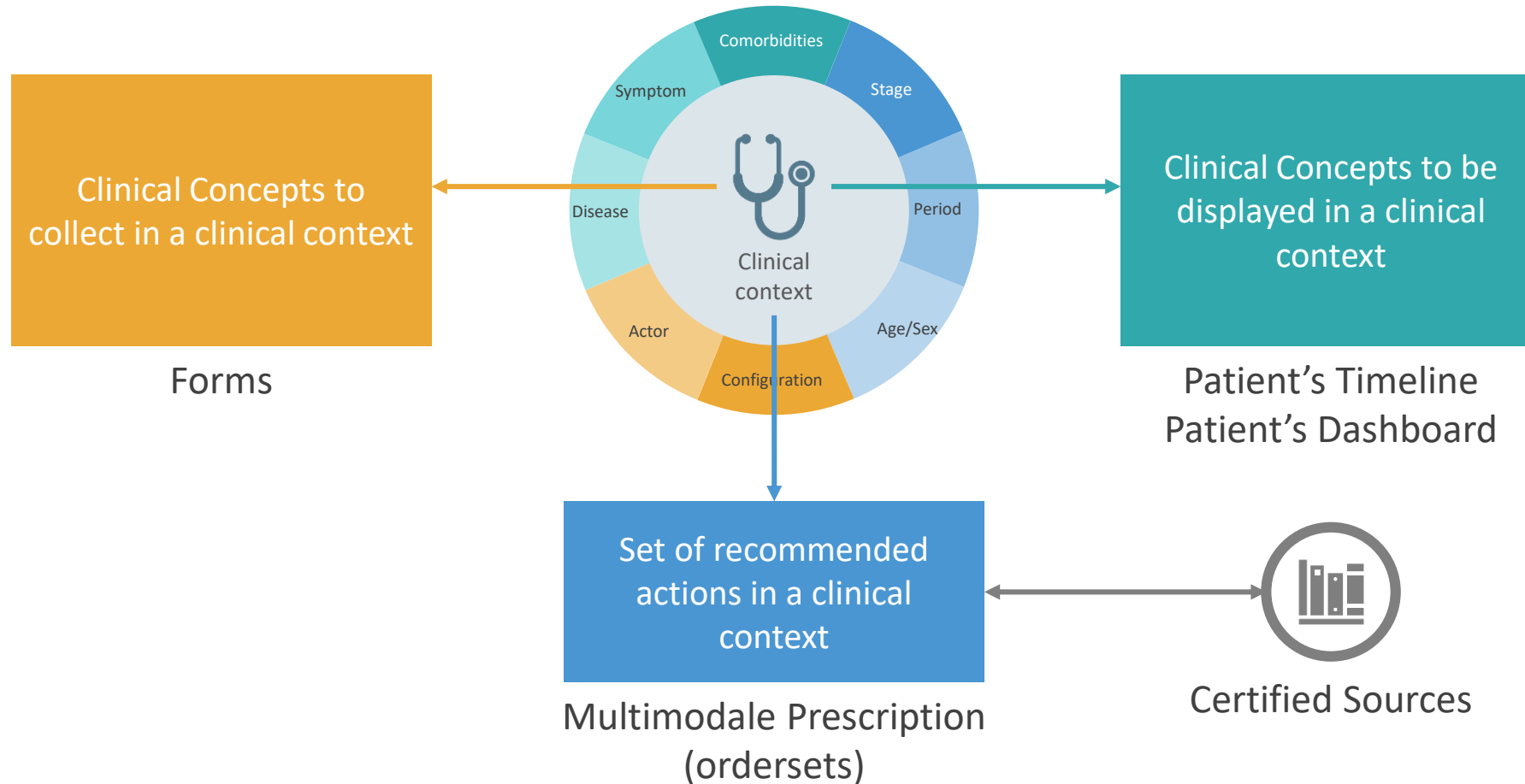
Clinical Context 1



Clinical Context 2



CUC, a Clinical Use Context

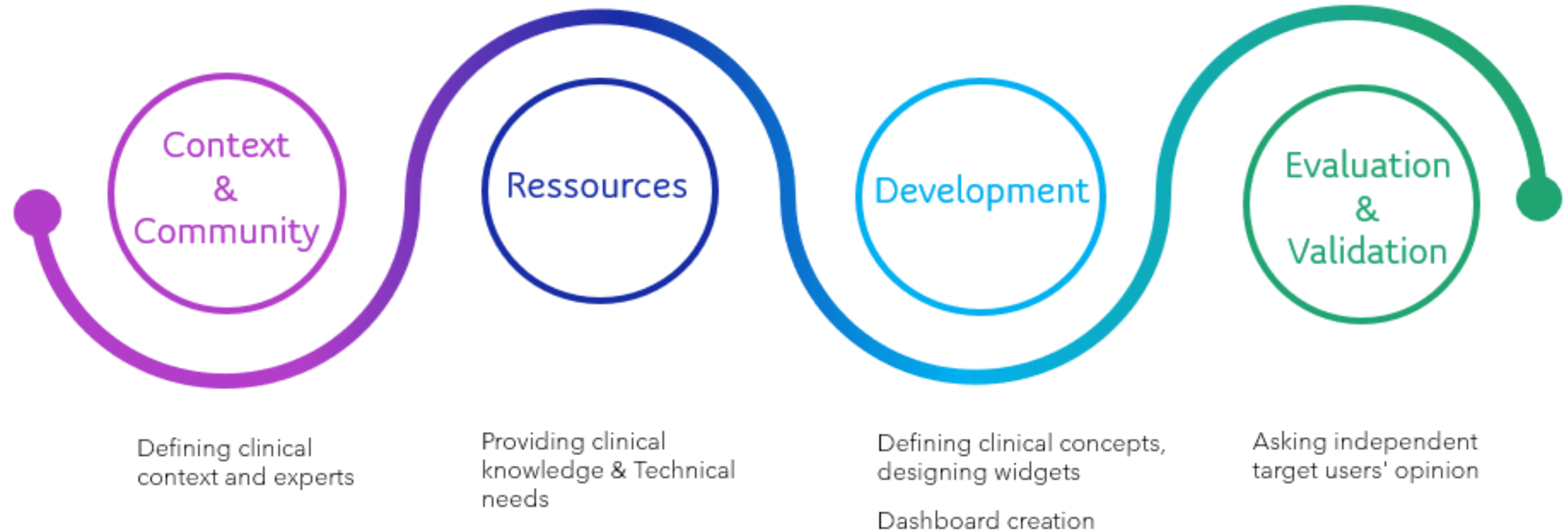


Method - Dashboard creation, how to manage it ?

A multidisciplinary working group (Health care professionals, Experts in IT, Clinical informaticians)

Four phases to create a clinical dashboard

Method - Dashboard creation, how to manage it ?





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ckp

CLINICAL KNOWLEDGE PLATFORM

LIFE FLOWS THROUGH OUR SOFTWARE

CKP components

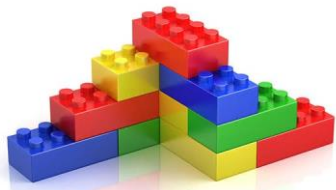
An atomized concept which includes only one and unique medical meaning in its most granular level



Clinical Concepts



Combine to



Clinical Concept Archetypes

All Clinical Concepts which have all together a clinical meaning



Combine to



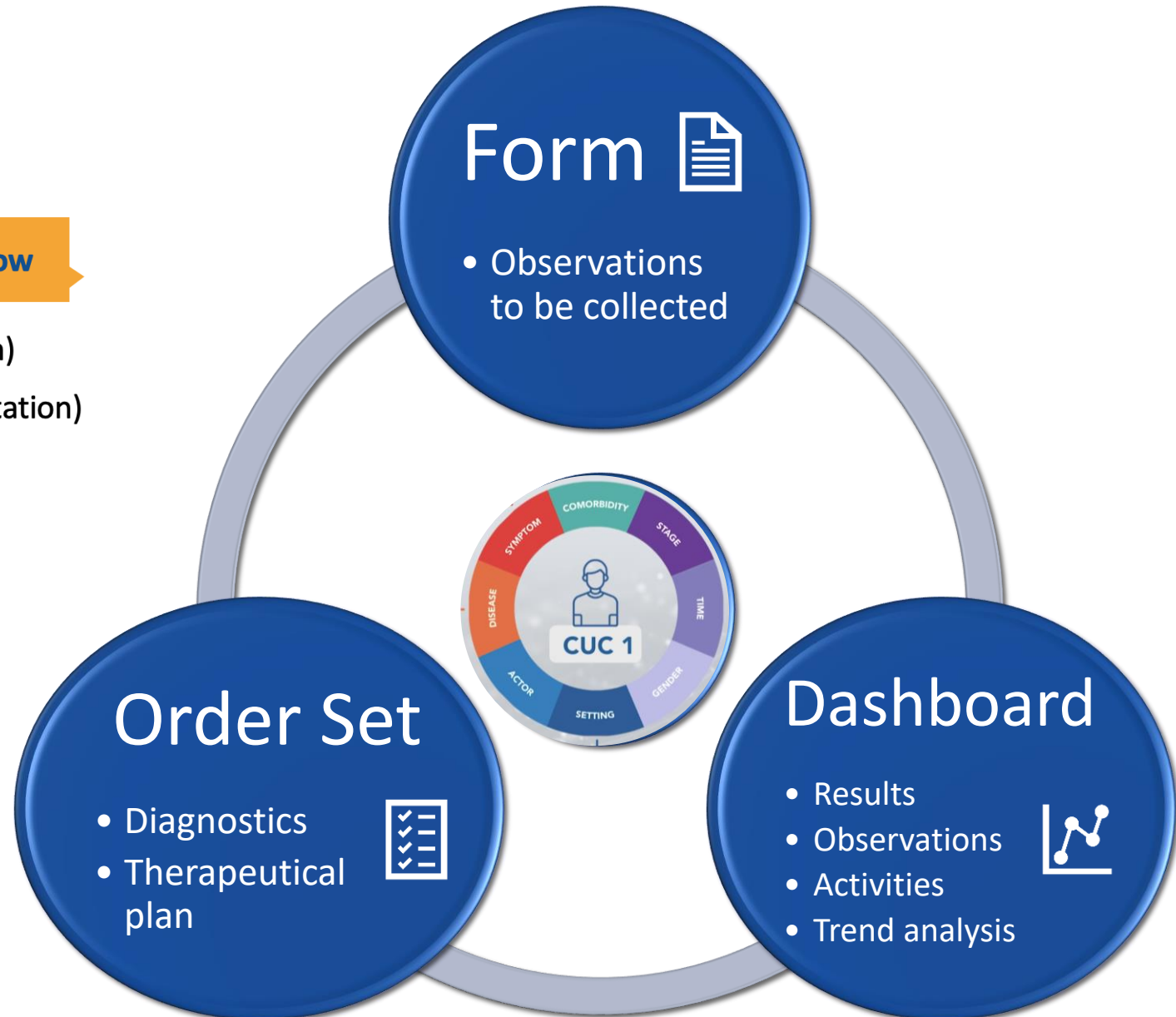
Clinical Use Contexts

A combination of CCA & CC that are used for a clinical purpose

Clinical Use Context Manifest

Search and retrieve definitions and settings to allow

- ✓ Dynamic forms configuration (data collection)
- ✓ Dynamic viewers configuration (data presentation)
- ✓ Dynamic order sets configurations



Case study : Sepsis dashboard

Phase 1 - Clinical context : patients with sepsis and suspected sepsis who are admitted to the ICU

Working group : 5 intensivists, 4 internists 4 infectious diseases specialists

Phase 2 - Official sepsis guidelines, released by Deutsche Sepsis Gesellschaft e.V. (AWMF)

Working Group of Scientific Medical Societies e. V



begin → professional societies

German Sepsis Society (DSG)

- Establishment of a research platform with the cooperation of clinics, institutes, medical research facilities and the researching industry
- Fast and efficient implementation of scientific findings in clinical care and

Case study : Sepsis dashboard

Widget	Description of items
Main diagnosis	Main diagnosis with the point in time when this diagnosis was determined/changed
SOFA	Sequential Organ Failure Assessment Score and trend from admission to current. Highlighted if ≥ 2
MAP, Lactate, Weight	Mean arterial pressure (MAP); Lactate Level; Actual body weight
Infection	Body temperature and 48 h trend; infection-relevant lab values; Highlighting of Values out of range. Important events (surgical intervention, specimen sampling). Microbiology status and results. Related medication
Cardiovascular	MAP, Heart rate and respective trends. Most recent Cardiac Output (CO) and -index (CI. Flip-card-behavior to show more details on cardiac parameters
Respiratory	SpO ₂ , Respiratory rate, ScvO ₂ and respective 24h trends. O ₂ -administration
Fluid balance	Fluid balance, arterial pH and 24h trend
Metabolism	Blood glucose and 24h trend, indicator if insulin administered.
Neurology	Glasgow coma scale and trend from admission to current.
Coagulation	INR, Thrombocytes, D-Dimer
Renal	Creatinine, GFT and Urea parameters
Gastrology	ALT, AST, Bilirubin
Tasks	Relevant one-off and recurring care activities and respective status
Specific medication	Includes drug therapy with vasoactive, anti-infective, coagulation modulation, homeostasis, and metabolic correction (e.g., insulin) intention
Recommendations	Clinical decision support recommendations

Case study : Sepsis dashboard

MAIN DIAGNOSIS

05.01.2022, 15:50

Nosocomial lobar pneumonia right, initial diagnosis 05.01.22. Sepsis

SOFA **2** ⬇

Admission

Sepsis possible

MAP **65** ⬇ mmHg

160/100

LACTATE **2,5** ⬇ mmol/l

Today at 10:00

BMI **20,8**

170/60

INFECTION

CRP 60 ⬆

WBC 10 ⬆

PCT 0,5 ⬆

06:00 10:00 14:00 18:00 22:00 02:00 06:00 10:00 14:00 18:00 22:00 02:00

blood culture medication operation

MICROBIO

05.01. 10:05 **Blood culture, Sample 1, Sample 2** **St.aureus pos**

06.01. 09:00 **Urine culture, Sample 1, Sample 2** In progress

Infection - related medication	Start	End	Etiotropic
Vancomycin TBL.500mg 1-1-1-1	05.01.2022		
Meropenem i.v.1000mg 1-1-1	05.01.2022		✓

Infection - related medication

CARDIO

160/100 mm Hg

MAP 60

80 bpm

Medication

Medication	Start
Noradrenalin	05.01.2022, 09:00
Bisoprolol	05.01.2022

NEURO

GCS 13 ⬆

Admission

METABOLISM

BS 120 mg/dl

BGA/FLUID

+100ml +2100 -2000

pH 7,4

Tasks (1-hour bundle)

- Lactat** repeat **more Info** (05.01.2022, 09:05)
- Blood culture** before ABX administration (05.01.2022)
- ABX** Broad spectrum (05.01.2022)
- Liquid** (goal: 30 ml/kg) (05.01.2022)
- Vasopressors** (05.01.2022)

ADDITIONAL DIAGNOSTICS/THERAPY

- EMG (booked 11.01.2022)
- ECHO
- CT Abdomen
- Rx Thorax
- Operative sanitation

+ All alerts resolved

RESPIRATORY

SpO2 94%

RR 24/min

ScvO2 75%

Mechanical ventilation 6 l/min Start: 07.01.22

HAEMATOLOGY

INR Thrombocyte D-Dimere

KIDNEYS

Crea GFR Urea

GASTRO

ALT AST total Bill

Relevant diagnoses

- Nosokomiale Pneumonia. Sepsis
- Susp. critical illness PNP
- Stroke (hospitalisation)
- Diabetes mellitus Typ II

[See all...](#)

Specific medication

VASOPRESSIVE THERAPY

- Noradrenalin Dopamin/Dobutamin
- Vasopressin other

ABX

Heparin

Insulin

[See all...](#)

Recommendations

- Consultation with social worker
- Decision support

Notes

All Doctors Nurses

05.01.2022, 06:00

Doc A.: Suspected critical illness PNP.



Case study : Sepsis dashboard

MAIN DIAGNOSIS

05.01.2022, 15:50

Nosocomial lobar pneumonia right, initial diagnosis 05.01.22. Sepsis

SOFA

2



MAP

65 mmHg

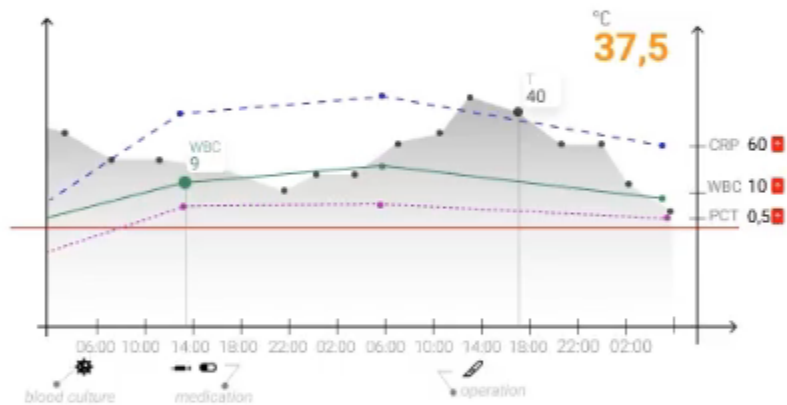
90/52

LACTATE

2,5 mmol/l

Today at 10:00

INFECTION



MICROBIO

05.01. 10:05 Blood culture, Sample 1, Sample 2 **St.aureus pos**

06.01. 09:00 Urine culture, Sample 1, Sample 2 **In progress**

Infection - related medication	Start	End	Etiotropic
Vancomycin TBL.500mg 1-1-1	05.01.2022		
Meropenem i.v.1000mg 1-1-1	05.01.2022		✓

CARDIOVASCULAR

90/52 mm Hg



MAP 65

HR 80 bpm

CO 5 L/min

CI 2.5 L/min/m2

Medication

Noradrenalin
0,15 µg/kg/min

Start

05.01.2022, 09:00

RESPIRATORY

SpO2

94%

Oxygenation index: 200

FI02

0,5

RR 24/min

ScvO2 75%

Hb 13 g/dL

VO2 250 ml/min

CPAP

PEEP 10 cm H₂O

Start: 07.01.22

Prone position

Start: 07.01.22

NEURO

GCS 13



METABOLISM

BS

120 mg/dl



FLUIDS/ACID-BASE BALANCE

+100ml

+2100

-2000



pH 7,4

KIDNEYS

GFR

90

Crea 1 mg/dl

Urea 25 mg/dl

K⁺ 4 mmol/l

COAGULATION

INR

0,9

PTT 35 sec

TC 200

D-Dimere 0,2 g/l

GASTRO

GRV

ALT 20 U/l

AST 24 U/l

Tasks (1-hour bundle)

- Lactat monitor more info
- Blood culture before ABX administration
- ABX Broad spectrum
- Fluids (goal: 30 ml/kg)
- Vasopressors

ADDITIONAL DIAGNOSTICS/THERAPY

- ECHO
- CT Abdomen
- EMG (booked 11.01.2022)
- Rx Thorax
- Surgical debridement
- +**

Paper record presentation VS dynamic dashboard presentation

Pasta shelf



Meat shelf



Sauces



Paper record presentation VS dynamic dashboard presentation

Ready to cook
Spaghetti
Bolognese kit



Case study : Sepsis dashboard Clinical UX evaluation

Physicians from various health care institutions in Australia, Germany, Switzerland, UK, and Italy independently evaluated the sepsis dashboard user experience (clinical UX).

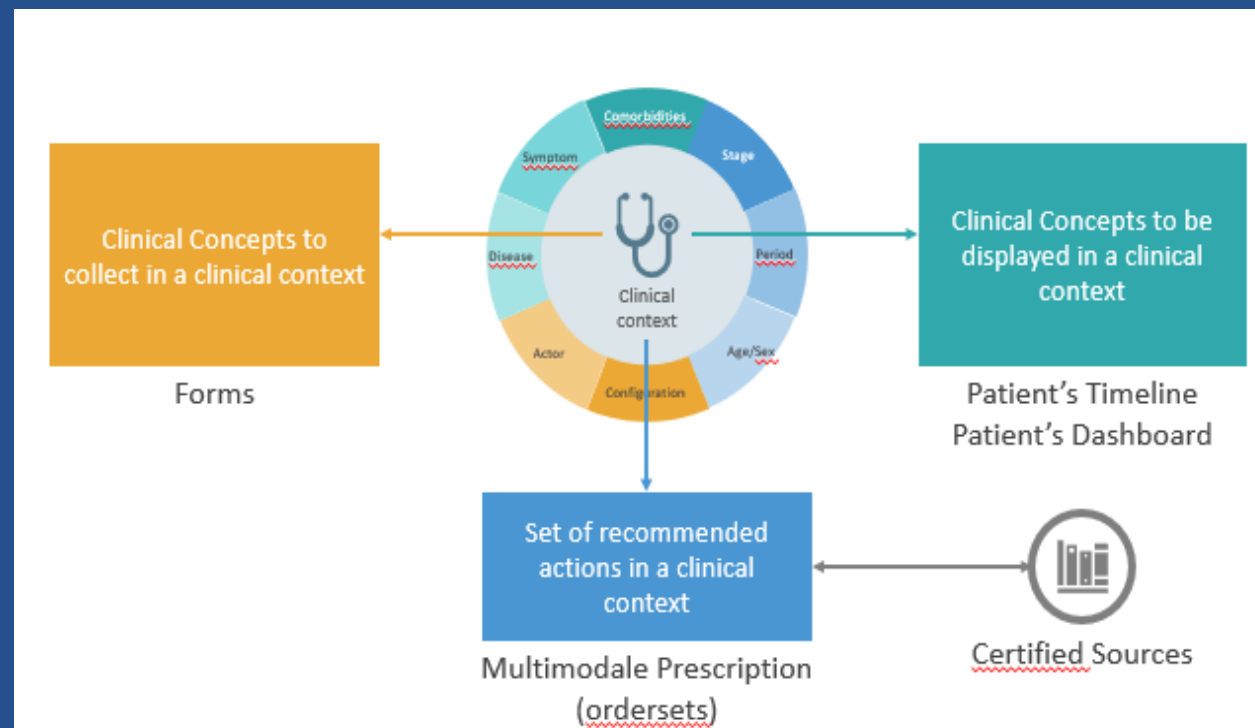
SUS score : 75.9

Very positive feedback from the target users
High appreciation of usefulness and design
expected positive impact on quality of care and patient safety

Next steps :

A quantitative evaluation of the impact of the dashboards in terms of behavior of target users and patient outcome

Using the method and CKP tool to Create other clinical dashboards





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**Thank you for your
attention**

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