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openEHR Templating Using the CGEM Framework

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Introduction

- **Heidi Koikkalainen MSc**
  - Director and Senior Health and Social Care Informatics Specialist at freshEHR
  - Background in social care services
  - Member of openEHR International Clinical Program Board Expert Panel
  - Member of the HL7 FHIR & openEHR collaboration IPS working group

- **Joost Holslag MSc**
  - Director and Senior Health and Social Care Informatics Specialist at freshEHR
  - Medical Doctor
  - Member of openEHR International Clinical Program Board
  - Member of openEHR International Specifications Program Board Expert Panel
  - Board member at openEHR NL

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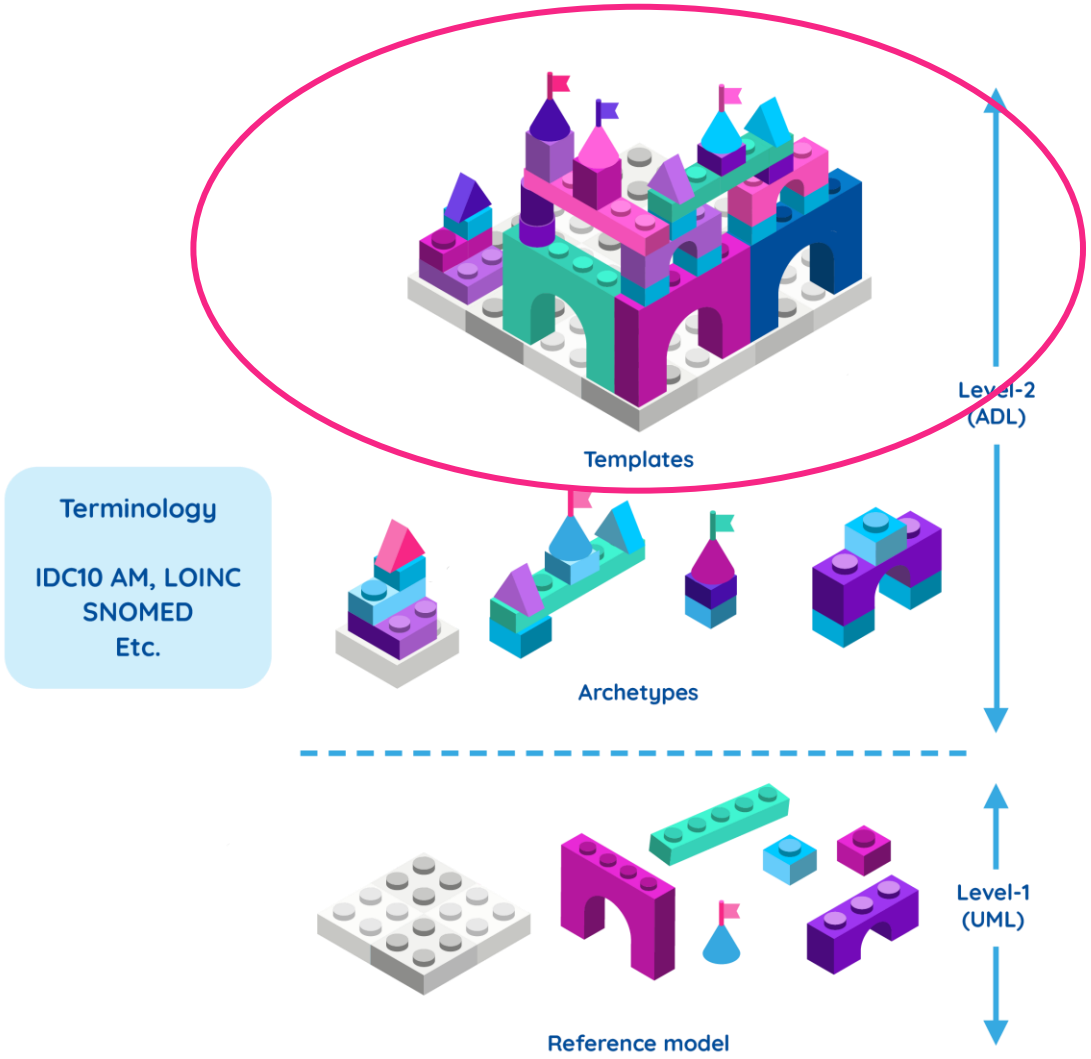
openEHR: Multi-level modelling



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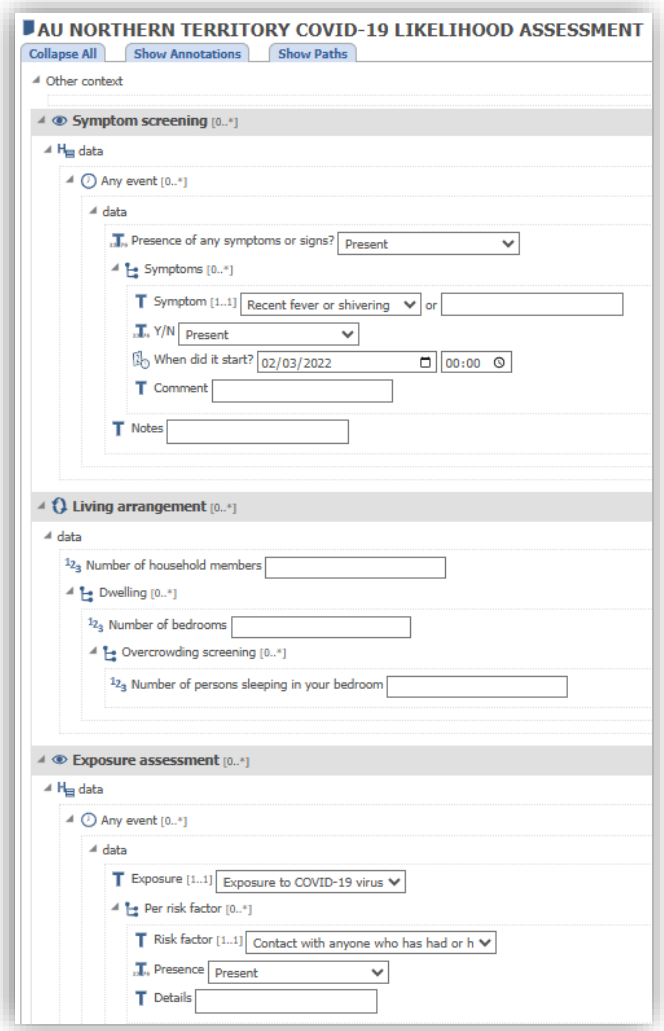
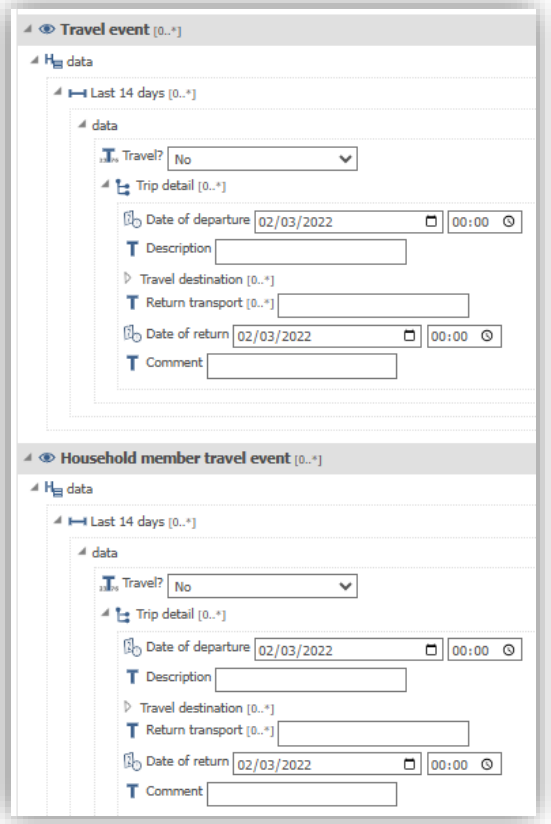
openEHR templates

- Compilations of archetypes built for specific use cases and settings
- Building a template = bringing together the required component archetypes and adjusting them to fit the local requirements
- No published templates in the international CKM





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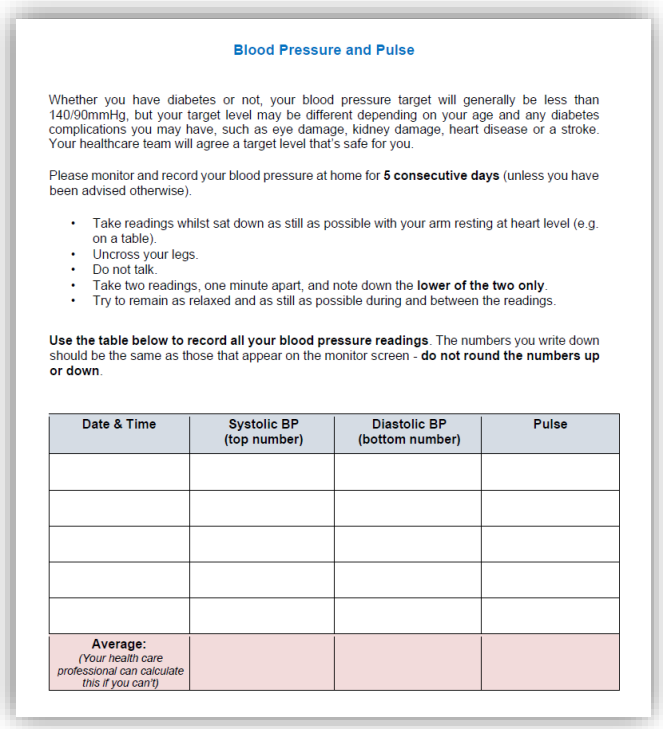
How do we design templates?

- **Traditional approach:** one template corresponds to a particular document, form or message
- User/human-centred design approach often applied
- Driven by UI / UX requirements



Blood Pressure and Pulse

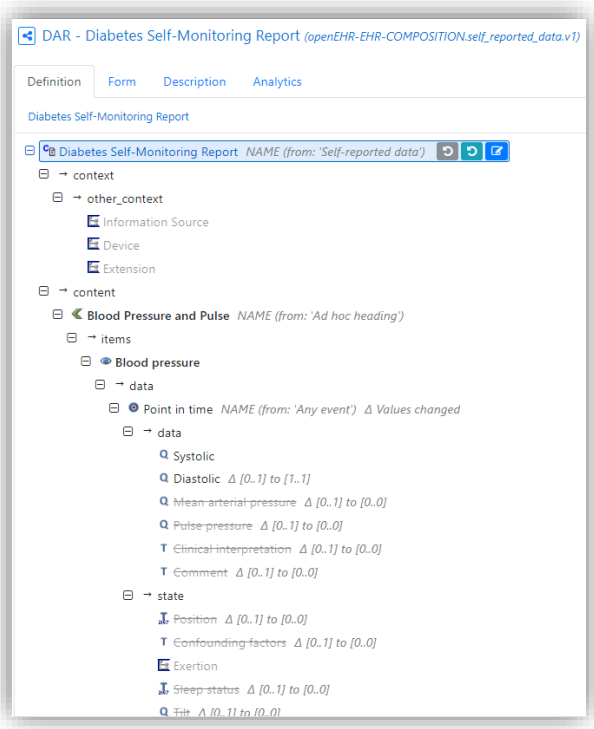
Whether you have diabetes or not, your blood pressure target will generally be less than 140/90mmHg, but your target level may be different depending on your age and any diabetes complications you may have, such as eye damage, kidney damage, heart disease or a stroke. Your healthcare team will agree a target level that's safe for you.

Please monitor and record your blood pressure at home for **5 consecutive days** (unless you have been advised otherwise).

- Take readings whilst sat down as still as possible with your arm resting at heart level (e.g. on a table).
- Uncross your legs.
- Do not talk.
- Take two readings, one minute apart, and note down the **lower of the two only**.
- Try to remain as relaxed and as still as possible during and between the readings.

Use the table below to record all your blood pressure readings. The numbers you write down should be the same as those that appear on the monitor screen - **do not round the numbers up or down**.

Date & Time	Systolic BP (top number)	Diastolic BP (bottom number)	Pulse
Average: *(Your health care professional can calculate this if you can't)*			



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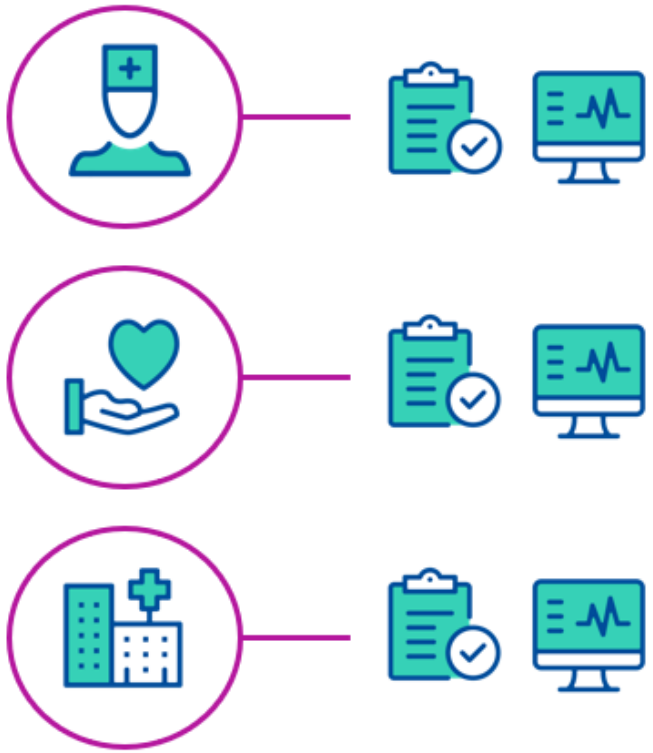
Limitations of the traditional approach

- Limitations of how user/human-centred design is applied in eHealth*
  - Tends to lead to overreliance on (fresh) end-user input
  - Risks supporting the status quo
- Service-centric view of data
  - Challenging in multi-disciplinary and care planning contexts
- **Data reuse not optimised**



*Van Velsen, L., Ludden, G., & Grünloh, C. (2022). The limitations of user-and human-centered design in an eHealth context and how to move beyond them. *Journal of medical Internet research*, *24*(10), e37341.

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Towards person-centric records

- openEHR platform approach
  - Separate apps from data
  - Data stored in a Clinical Data Repository (CDR)
- Data-centric template design
  - Focus on the full lifecycle of data
  - Consider governance and access rules
- **Information for life**
  - Longitudinal, person-centric health and care records
  - One source of truth for some key information

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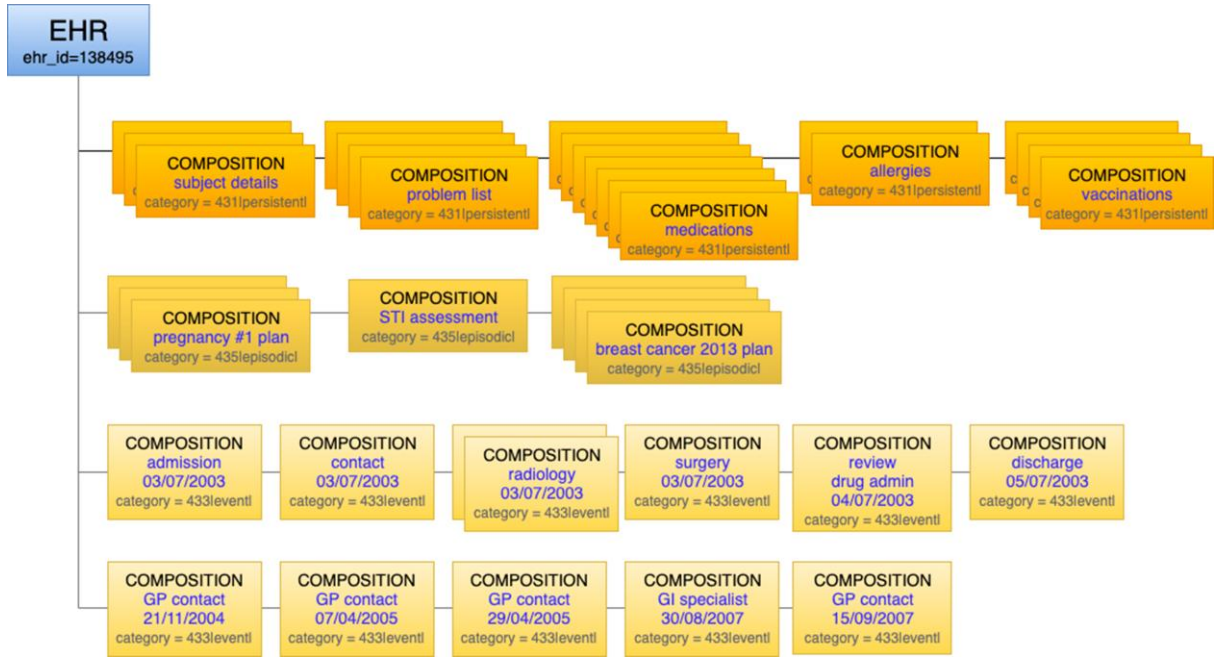
openEHR compositions

- Information in the CDR is always stored in one or more **compositions**
- The structure and content of each composition is defined in an openEHR **template**
- Composition categories:
  - Event
  - Persistent
  - Episodic
- Form ≠ composition



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Modelling choices

- **Tactical modelling** (traditional approach)
  - build templates and forms that meet the immediate needs of the user/team entering the data

- **Strategic modelling**
  - build templates that have a holistic perspective of the data – beyond the immediate team – so that information is maximally patient-centric and reusable across different forms

- **Strategic modelling / Tactical forms**
  - even if the data is modelled strategically, forms should remain tactical, i.e. sympathetic to the data-entry responsibilities and needs of the immediate user

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What is CGEM?

CGEM stands for:

- Contextual Situation
- Global Background
- Event Assessment
- Managed Response

Contextual Situation

Information closely associated with a person's care journey or clinical situation (e.g. cancer care pathway, pregnancy)

Global Background

Information that is true about the person regardless of the specific care context they are in (e.g. allergies, CPR wishes, communication needs)

Event Assessment

Information recorded repeatedly as events over time (e.g. lab results, vital signs recordings)

Managed Response

Information that requires a formal order cycle (Instruction/Action) (e.g. referrals, prescriptions)

Introduction to the CGEM Framework: https://freshehr.notion.site/Introduction-to-the-CGEM-Framework-115ed58514b344da825c3b42c372aff2

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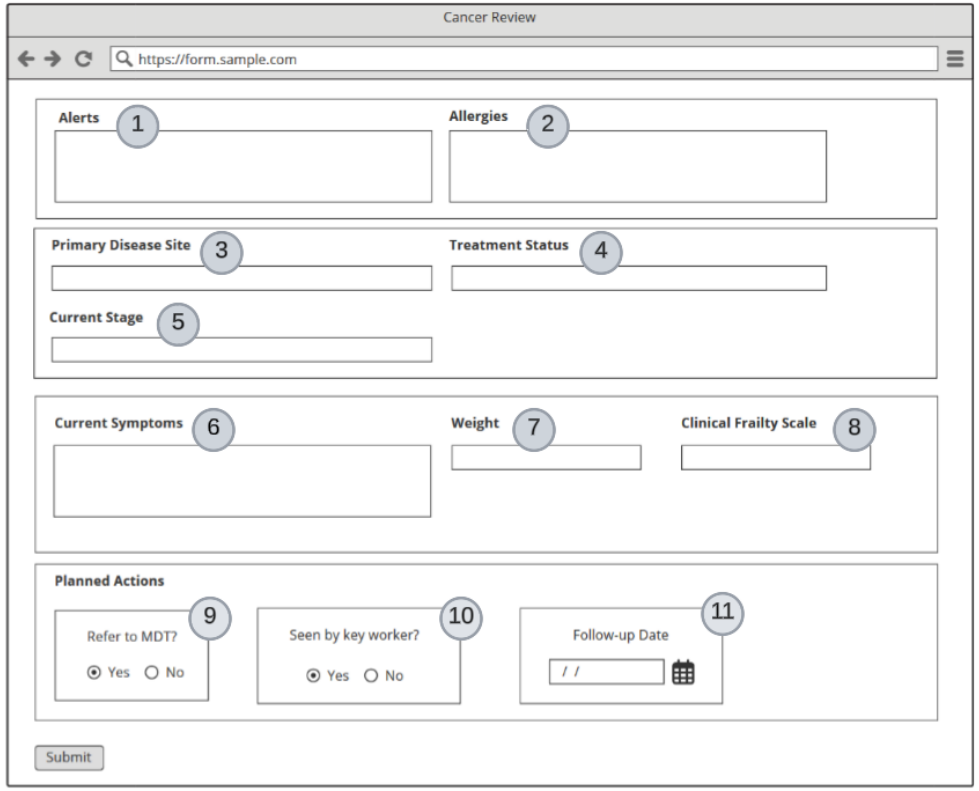
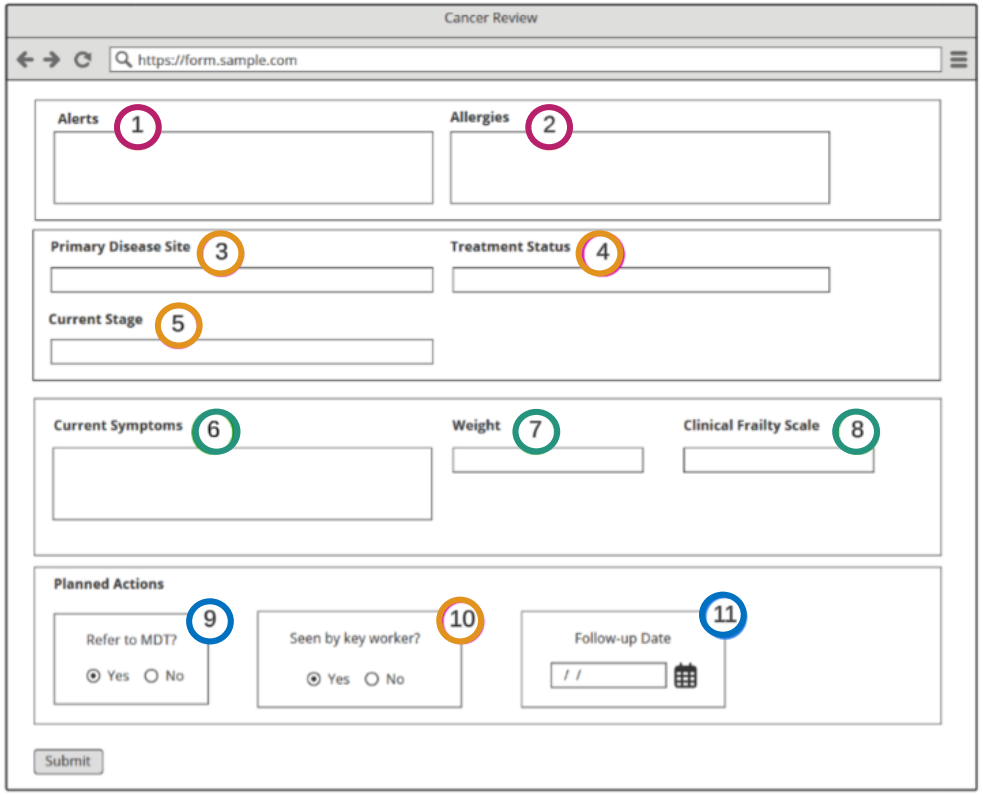
Applying CGEM to a ‘Cancer Review’ dataset





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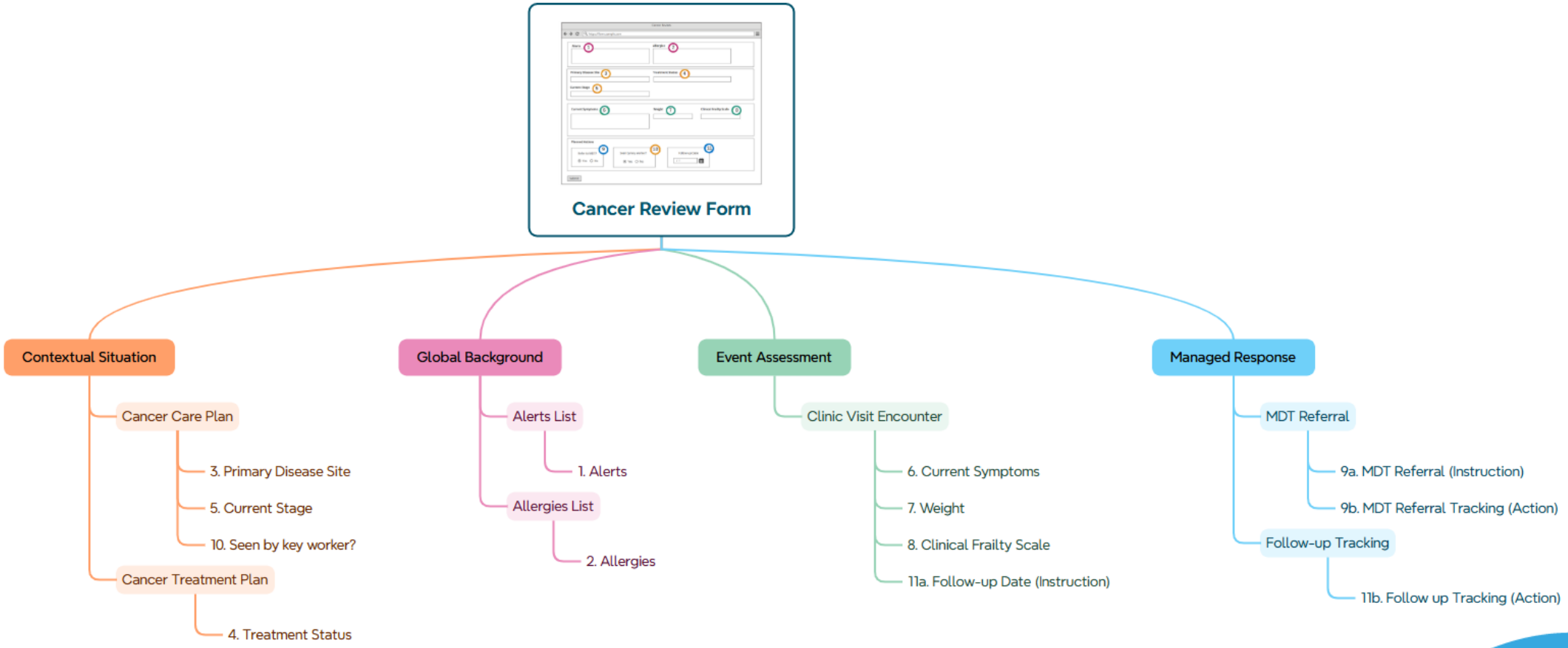

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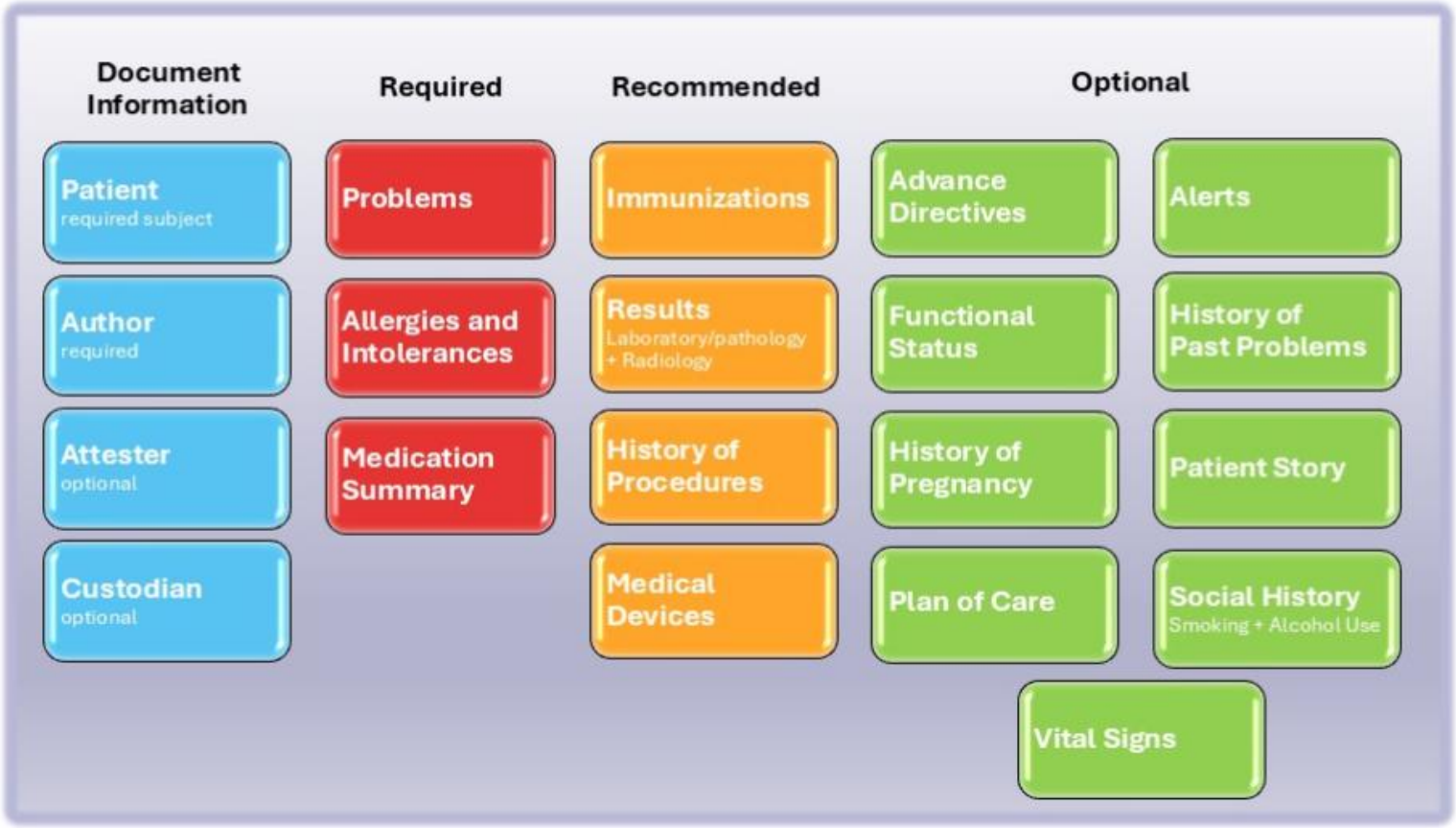
International Patient Summary



HL7 FHIR IPS Implementation Guide v2: https://build.fhir.org/ig/HL7/fhir-ips/en/index.html

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