PSS – API

Prescription Search Support (RIZIV-INAMI)

JANUARY 13, 2025
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1. Document management

1.1. Document history

Version	Status	Date	Author(s)	Modifications
1.0	Draft	13/01/2025	Nick Sneijers	First version of the cookbook for the release 1.0 scope « MVP » of PSS
1.1	Final	06/02/2025	Nick Sneijers	First version for validation
1.2	Draft	01/04/2025	Inge Sneppe	Documentation front-end requirements antimicrobial domain Documentation front-end requirements radiology domain

1.2. Document reviews

Reviewers	Name(s)	Reviewed version	Comments
SPOC client PSSa	Jeroen De Wilde	1.0	
Analyst client PSSa and PSSr	Kevin Poilvache	1.0	
Analyst client PSSa and PSSr	Nathan Peeters	1.0	

2. Reference

2.1. eHealth reference

All referenced documents are available on the portal of the eHealth platform. These versions, or any following ones, can be used for onboarding and accessing the eHealth platform service.

ID	Title	Version	Date	Author
1	eHealth Services – Web Access	2.0	12/07/2018	eHealth platform
2	Identity & Authorization Management (IAM) eXchange	1.1	28/06/2024	eHealth platform

eHealth API Catalog: https://portal.api.ehealth.fgov.be/

2.2. FHIR references

ID	Title	Link
1	Implementation guide	https://www.ehealth.fgov.be/standards/fhir/pss/index.html
2	data-absent-reason	http://hl7.org/fhir/StructureDefinition/data-absent-reason
3	cpg-condition	http://hl7.org/fhir/uv/cpg/StructureDefinition/cpg-condition
4	condition-clinical	http://terminology.hl7.org/CodeSystem/condition-clinical
5	condition-ver-status	http://terminology.hl7.org/CodeSystem/condition-ver-status
6	condition-category	http://terminology.hl7.org/CodeSystem/condition-category
7	cpg-activity-type-cs	http://hl7.org/fhir/uv/cpg/CodeSystem/cpg-activity-type-cs
8	translation	http://hl7.org/fhir/StructureDefinition/translation
9	cpg-questionnaireresponse	http://hl7.org/fhir/uv/cpg/StructureDefinition/cpg-questionnaireresponse
10	Examples	https://www.ehealth.fgov.be/standards/fhir/pss/artifacts.html

3. Document information

3.1. Glossary

Term	Definition
ExchangeId	This is a unique number assigned by PSS to each PSS consultation issued.
PSS	This is the name given to the API which helps the prescriber making the correct recommendation. PSS stands for “Prescription Search Support”.
PSSa	Prescription Search Support specifically for the domain antimicrobial
PSSr	Prescription Search Support specifically for the domain radiology
EPD	**The Electronic Patient Dossier (EPD)** in Belgium is a digital file that contains a patient's health information. The dossier is updated after each contact with healthcare providers and ideally includes data from all clinicians involved in the patient's care. The EPD ensures that medical information can be quickly and securely shared between healthcare providers and institutions, contributing to better quality of care and efficiency.
Prescriber	The person who initiates the prescription search support
Patient	The individual which is the subject of the prescription search support
Guideline manager	The guideline manager is a medical expert, specialized in a specific type of care (domain). The guideline manager is responsible for keeping the PSS content up-to-date with new scientific insights related to his domain.
Indication	The (clinical) indication is a disease, symptom or circumstance that makes a particular test, medication or procedure advisable.

Support Parameter	• A *Support Parameter* represents a question or condition (such as "Is the patient a risk patient?") so that all factors are collected to help PSS search the best support for the given indication (such as "Otitis media") and patient information. The list of Support Parameters that is required can vary depending on the *Indication* and logic applied.
	• The Support Parameter can have defined possible values (like "yes" or "no"). The value of a *Support Parameter* is determined by the patient’s situation. The Support Parameter value can be
	  • directly retrieved from the patient data,
	  • or automatically derived by PSS from a set of Patient Variable values,
	  • or can be manually overridden by the end user that is requesting support.

	The manual override of values is important to give the prescriber always the hand on correcting or completing the patient situation if necessary, as information in the EPD might not always be up to date. Some parameters cannot be retrieved from the EPD but serve as a reminder for the prescriber to do certain observations during patient visit (such as "dyspnea at rest or use of accessory muscles of respiration". The set of Patient Variables, and the rules on how they can define the Support Parameter value, are defined by an expert group and are handled and managed to be in line with the latest scientific insights in the PSS system.
Patient Variable	A *Patient Variable* is an individual characteristic or piece of information about a patient that can influence the treatment process or support outcome. These variables are sourced from the Electronic Patient Data (EPD) and include attributes like allergies, past operations, comorbidities, immune system dysfunctions, and previous medications. *A set of Patient Variables* values can be used to derive the value of the parent Support Parameter. They are typically represented by coding systems (e.g., SNOMED CT) and values that describe the patient's condition in a standardized way. This is not always the case.
List of recommendations	The PSS result is the list of recommendations, based on the given input(s). The list of recommendations is a list of support options. Each support option contains a score and instruction. They are ranked by score of appropriateness. The scientific evidence is linked to the list of recommendations.

3.2. Formatting explanation

- When a word is in **bold** and *italic* : that is a field in the FHIR specification. Ex : ***status***.
- When a word is between quotation marks “” : This is the value that the specific field can have. Ex : “ready”.
- All FHIR resources mentioned in this document are described in the official eHealth FHIR implementation guide pages. Specific links are available in section 2.2.

4. Goal of the document

The goal of this document is to provide all the information needed to integrate PSS.

This document will describe the project but also what is around the project like how an integrator can have some support and what is needed to call PSS.

PSS uses FHIR to exchange messages with the integrators. This document will explain some fundamental concepts to understand what must be given and what happens by doing the different operations.

The access management will be also explained to allow the integrators to know when an operation can be called.

After these explanations, this document will describe all the operations available respecting the following structure :

- A description of the operation.
- The endpoint to call.
- The rules implemented in PSS
- Some information about the request to send
- Some information about the response

5. Support

5.1. For issues in acceptance

Issues in acceptance can be reported by sending a mail to integration-support@ehealth.fgov.be.

5.2. For issues in production

Issues in production can be reported by sending a mail to integration-support@ehealth.fgov.be.

5.3. Certificates

In order to access the secured eHealth platform environment each integrator has to obtain an eHealth platform certificate, used to identify the initiator of the request. Please consult the chapter about the eHealth Certificates on the portal of the eHealth platform:

- https://www.ehealth.fgov.be/ehealthplatform/nl/ehealth-certificaten
- https://www.ehealth.fgov.be/ehealthplatform/fr/certificats-ehealth

For technical issues regarding eHealth platform certificates:

- Acceptance: acceptance-certificates@ehealth.fgov.be
- Production: support@ehealth.fgov.be

6. Global overview

6.1. Context (goal of the project)

The goal of PSS (Prescription Search Support) is to help the prescriber in prescription processes in the application domains of:

- Antimicrobials
- Radiology
- Clinical Biology (out of scope in this document)

Prescriptions in these 3 domains count for more than 48 million prescriptions per year.

Two types of prescriptions can currently be distinguished:

1. Referral prescriptions, these will be handled by the future UHMEP platform, these are applicable for the domains of Radiology and Clinical Biology
2. Medication prescriptions, these are consultable via the VIDIS platform and are stored in the Recip-e database, these are applicable for the domain of Antimicrobials

Commented [KP1]: (To be confirmed by Maarten & Jeroen) Is it not better to delete the references to Clinical Biology? (Not yet in the scope of the Cookbook)

Commented [JD2R1]: For me it is OK to leave it, as it describes the global context for PSS, but maybe add it (see my suggested trackchange) and say it is out of scope in this document

Adequate evidence-based support in the prescription processes contributes to the quality and effectiveness of prescribed care decisions. This is important for RIZIV-INAMI, which as a key actor in social security is responsible for reimbursements. RIZIV-INAMI acts in this project also as a joint-controller with FOD Volksgezondheid/SPF Santé publique/FPS Health, responsible for the legal context around prescription search support. The project improves cooperation and information exchange between the various actors involved, thus contributing to an overall increased quality of care.

Generic PSS platform

Healthcare provider decision makers and executors can query the Prescription Support Service (PSS) in a secure manner in the context of a new or an existing care decision when making a prescription. The guidelines and decision rules for making care decisions are complex and specific by type of care. To support care decision making during the prescription processes, PSS will search a library of scored guidelines based on clinical indications that are predefined for each domain. The guidelines are subject to change over time, therefore the platform should also facilitate keeping the guidelines up-to-date. Moreover, the platform provides added value in an educational environment by enabling familiarization with the system. To make PSS operational quickly, we aim for smooth communication and integration with the software integrators.

Antimicrobial

Every year, about 11.5 million prescriptions are created in the field of "Antimicrobial". Via better alignment with the antibiotics guidelines established by BAPCOC (Belgian Antibiotic Policy Coordination Commission), and related decision rules established by EBPracticeNet, we expect that fewer incorrect antibiotic prescriptions will be made. Today, mainly antibiotics for respiratory and urinary tract infections are incorrectly prescribed.

Radiology

Every year, there are more than 20.5 million referral prescriptions for examinations in the field of "Radiology". This includes many examinations that are unnecessarily prescribed and performed. The

decision rules for "Radiology" are very complex. Therefore, the European ESR iGuide serves as a source for the imaging referral guidelines, in order to achieve better and more efficient use of the imaging resources.

Clinical biology

Out of scope in this document as it will not be available in 2025

6.2. Access management

6.2.1. eHealth token

The token of eHealth allows PSS to identify who is connected. Each integrator has to send the user token with the request if they want to use the PSS API

The exchanged token has the following information that will be used for the access management:

- NIHDI number for the healthcare professional
  - In absence of the NIHDI number, PSS will use the SSIN for the healthcare professional
- The discipline of the healthcare professional

There is other information present in the token but those are not used for the access management.

6.2.2. Disciplines

There is no distinction between the disciplines of the prescriber regarding access.

The current four disciplines are :

- Pharmacist
- Physician
- Dentist
- Midwife **(In a later phase)**

The operations accessible by these disciplines are the following ones:

- Get Data to Collect
- Get Diagnoses
- Get Recommendations

6.3. FHIR

FHIR (Fast Healthcare Interoperability Resources) is used by PSS as the transport layer. All communications with PSS should follow the guidelines defined by HL7. The Belgian version of FHIR is managed by eHealth. Whenever available, links in this document should refer to the Belgian FHIR

resources; otherwise, international resources will be used if no specific changes have been enforced in Belgium.

PSS follows the FHIR R4 version. All resources used in PSS align with the implementation guide artifacts from HL7 Belgium. This document does not define custom profiles but will reference the applicable FHIR resource definitions. In general, PSS supports all fields marked as “Must Support” (to be confirmed in a future release) and all mandatory fields specified in the FHIR documentation.

The implementation guide serves as a reference for both integrators and PSS, ensuring proper communication between EPD and PSS at the moment of sending and processing messages. Additionally, it can be used as a JSON validator on both ends of the communication. More details can be found at the following link: https://www.ehealth.fgov.be/standards/fhir/pss/index.html

6.3.1. Capability Statement

As a FHIR compliant server, PSS makes available a statement of the accessible features. It is described in the CapabilityStatement page from the FHIR International website.

This method is accessible to everyone, without any token from eHealth. The endpoint is the following:

GET /metadata

PSS will send back the resource CapabilityStatement filled with information about the API.

6.3.2. Recommendations in FHIR resources

In PSS, reaching a list of recommendations requires the prescriber to go through several steps, which vary depending on the domain. Each domain defines specific workflows that are translated into FHIR resources to enable structured and interoperable decision-making.

6.3.2.1. Antimicrobial Domain

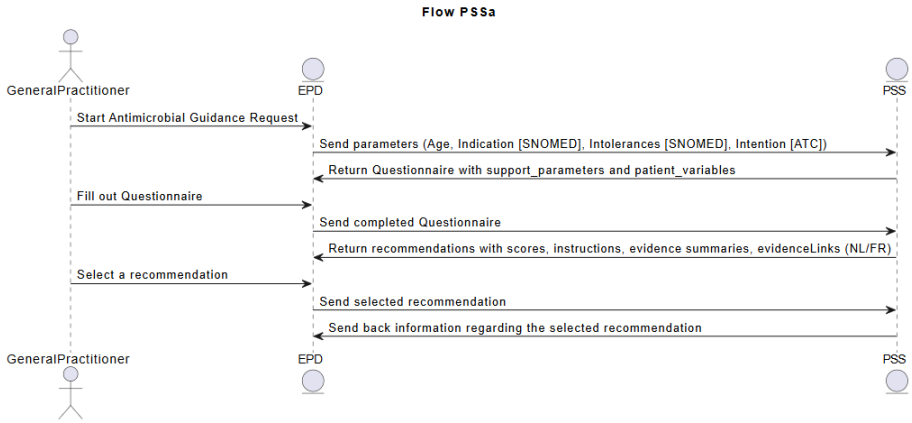
1. **Selecting an Indication**: The prescriber selects an indication. Based on this selection, PSS provides a list of required **support parameters** and **patient variables**. These can be retrieved using the following endpoint:

   POST /PlanDefinition/GetDataToCollect/$apply

2. **Providing the Required Data**: After the prescriber supplies the necessary support parameters and patient variables, PSS generates a list of recommendations. The required data can be **entered manually by the prescriber or automatically populated by the EPD**. These recommendations are available at the following endpoint:

   POST /PlanDefinition/GetRecommendations/$apply

6.3.2.1.1. Sequence diagram



6.3.2.2. Radiology Domain

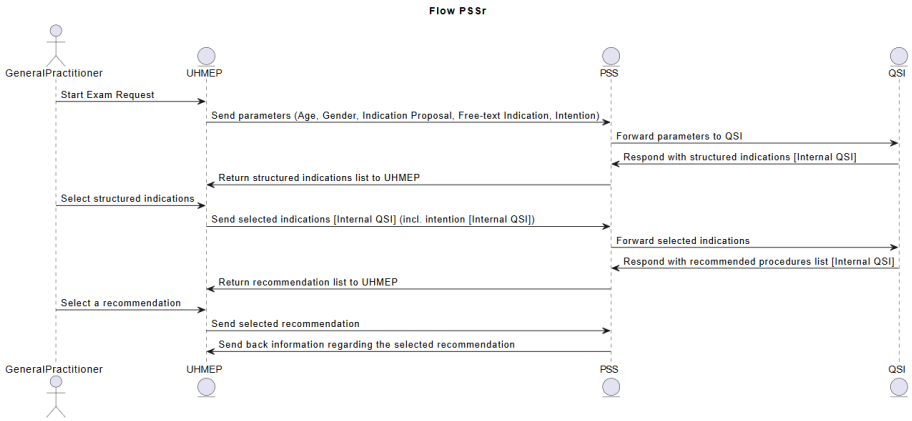
- **Receiving Existing Data:** PSS receives pre-existing data, including details such as **sex**, **age**, **SNOMED codes**, **indication**, and **examination proposal**. Based on this input, PSS generates a list of possible indications related to the provided parameters. These possible indications can be accessed by endpoint:

  POST /PlanDefinition/GetDiagnoses/$apply

- **Selecting Indication(s):** The prescriber selects one or multiple indications from the generated list. PSS then produces a list of recommendations tied to the selected indication(s), which can be consulted at endpoint:

  POST /PlanDefinition/GetRecommendations/$apply

6.3.2.2.1. Sequence diagram



7. Technical requirements

7.1. API documentation

The last version of FHIR API interface described with a JSON / Swagger API is available on the eHealth API

Portal :

Environment	Endpoint
Acceptance	https://portal-acpt.api.ehealth.fgov.be
Production (not available at this moment)	https://portal.api.ehealth.fgov.be

Endpoint to call PSS is described in the API documentation on the eHealth API Portal.

Various operations are available and detailed in Section 8.

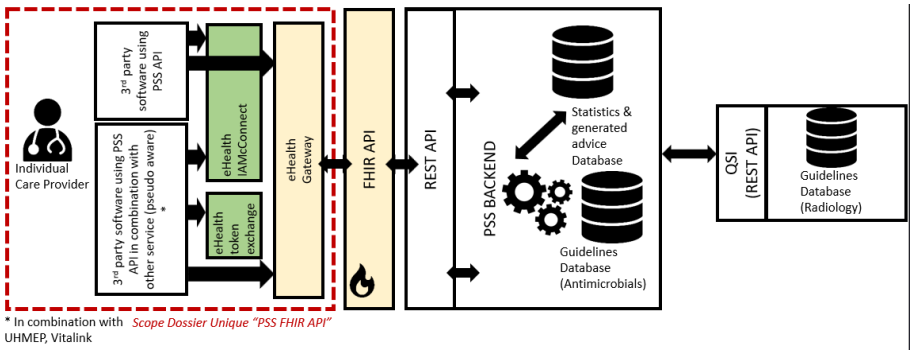
8. Description of the operations

8.1. Common validations

For all incoming requests, PSS applies a suite of common validations if the request is validated by the implementation guide described in section 6.3.

8.1.1. Authentication

Each user that wants to use PSS must be authenticated in order to be allowed to use PSS. PSS will verify the validity of the access token. PSS will also use the other information contained in the token to accept or reject the request. This behavior has been described in the section 6.2 talking about access management.



8.2. Common resources

These **common resources** are used in multiple FHIR requests and responses throughout the PSS process, they serve as fundamental building blocks for sharing healthcare-related information across different systems.

8.2.1. Bundle resource

Purpose: The Bundle resource serves as a container for grouping related resources into a single cohesive request/response. It ensures that all necessary resources for a particular operation are provided together in a structured manner. This is particularly useful in the PSS system, where multiple resources need to be collected and processed as a unit. The Bundle resource includes fields such as resource type, unique identifier, and a list of entries, each representing a resource included in the bundle. By using a common Bundle resource, the PSS system facilitates efficient and organized data exchange, enhancing interoperability and consistency across different healthcare systems.

Field	Description
resourceType	Identifies the type as "Bundle"
id	A unique identifier for the bundle
meta.profile	Specifies the canonical URL of the profile that this Bundle conforms to. In PSS, this ensures the structure and content of the Bundle align with the expected specification.
type	Indicates the type of bundle, for PSS this will always be a "collection"
entry	A list of entries (resources) included in the bundle

8.2.1.1. Implemented rules

The following rules apply to the Bundle resource fields:

- The field ***meta.profile*** can have one of the following values:
  - For a request: "https://www.ehealth.fgov.be/standards/fhir/pss/StructureDefinition-PSSRequestBundle.html"
  - For a response: "https://www.ehealth.fgov.be/standards/fhir/pss/StructureDefinition-PSSResponseBundle.html"

8.2.2. Patient resource

Purpose: This Patient resource is a key element in the PSS (Prescription Search Support) system. It holds anonymized demographic information (e.g., age and gender) needed for clinical decision support and data collection processes without revealing personal identifiers. This allows the PSS system to operate in a privacy-preserving and interoperable way, enabling consistent handling of patient-related data across FHIR requests.

Field	Description
resourceType	Identifies the type as "Patient"
id	A unique identifier for the patient
meta.profile	Specifies the canonical URL of the profile that this Patient resource conforms to. This ensures the patient data adheres to the required structure and validation rules defined by the PSS specification.
extension.url	Specifies the URL for the extension, which gives the patient's age without needing a full date of birth.
extension.valueAge	Indicates the relevant age (in years)
extension.valueAge.value	The numerical quantity representing the patient's age. This is the measurable value.
extension.valueAge.system	The **coding system URI** that defines the units used.
extension.valueAge.code	The **unit of measure code** corresponding to the value.
active	Boolean indicating whether the patient is active.
name.extension.url	Specifies the URL for the extension indicating the patient name is masked or intentionally withheld.
name.extension.valueCode	The reason the name is masked, here "masked", meaning the actual value is unavailable due to privacy or policy constraints.
gender	The patient's gender
deceasedBoolean	Boolean indicating whether the patient is deceased

8.2.2.1. Implemented rules

The following rules apply to the Patient resource fields:

- The field ***meta.profile*** should have the following value "https://www.ehealth.fgov.be/standards/fhir/pss/StructureDefinition-PSSPatient.html"
- The extension for age must include these two subfields:
  - ***url***: "https://www.ehealth.fgov.be/standards/fhir/pss/StructureDefinition/PSSRelevantAge"
  - ***valueAge***:
    - ***value*** (numeric age)
    - ***system*** with value "http://unitsofmeasure.org"
    - ***code*** with value y (for years)
- The field ***gender*** can have one of the following values:
  - "Male"
  - "Female"
  - "Unknown"
- The extension for name must include these two subfields:
  - ***url***: "http://hl7.org/fhir/StructureDefinition/data-absent-reason"
  - ***valueCode***: "masked"

8.2.3. RequestGroup resource

Purpose: The RequestGroup resource defines and organizes a collection of related actions or tasks, such as data collection or diagnostic recommendations. It provides a high-level overview of what needs to be done and links to the detailed tasks. The RequestGroup resource includes fields such as status, intent, subject reference, and an array of potential actions. Each action can have its own selection behavior, text equivalent, and reference to related resources. By using a common RequestGroup resource, the PSS system ensures that all proposed actions are part of a coherent and actionable group, facilitating better coordination and decision-making in patient care.

RequestGroup fields

Field	Description
resourceType	Identifies the type as "RequestGroup"
id	A unique identifier for the RequestGroup
meta.profile	Specifies the canonical URL of the profile that this RequestGroup resource conforms to. This ensures the structure and content of the request group align with the PSS implementation guide and validation rules.
status	The status of the request group
intent	The intent of the request group
subject - ***subject.reference***	A reference to the associated patient
action	Proposed or planned actions: defines the steps, documentation, or linked activities like MedicationRequests.

Action (inside action) Fields

Field	Description
documentation	Supporting documentation or links relevant to the action (e.g., guidelines, documents)
- documentation.type	Type of documentation
- documentation.label	Label text to describe the document
- documentation.url	URL link to the supporting documentation
selectionBehavior	Defines rules about how actions should be selected
action	Nested actions
textEquivalent	Textual representation of the action for display
resource	Reference to the actual FHIR resource to perform
extension	Additional information like rating (e.g., clinical appropriateness rating).

8.2.3.1. Implemented rules

The following rules apply to the RequestGroup resource fields:

- The field ***meta.profile*** should have the following value "https://www.ehealth.fgov.be/standards/fhir/pss/StructureDefinition-PSSResponseRequestGroup.html"
- The field ***status*** will always have the value "active"
- The field ***intent*** will always have the value "proposal"

8.3. Common fields

This section outlines the fields that are frequently utilized across various resources. The common fields include essential attributes such as text status, narrative text, and coded concepts, which are used to represent and convey critical information in a structured and standardized manner.

Field	Description
Code	This element represents a coded concept that describes a specific value or meaning within a structured data model. It is commonly used in FHIR resources to standardize terminology across systems.
- code.coding	This is an array (or list) of coding elements that provide multiple representations of the same concept using different code systems. Each entry in this list represents a coded value from a specific system.
- code.coding.system	This element specifies the URI (Uniform Resource Identifier) of the coding system from which the code is derived. It helps ensure interoperability by defining the source terminology (e.g., SNOMED CT, ICD-10, LOINC)

- code.coding.code	This element contains the actual code value that represents a specific concept within the defined coding system. It is the unique identifier for a term or concept within that system

8.3.1. Operations on Antimicrobial

PSSa aims to assist prescribers in making informed decisions regarding antimicrobial prescriptions. This support is provided through a series of steps, starting with the collection of patient information and followed by generating recommendations based on the collected data. All information, including questionnaires, recommendations, and evidence links, will be provided in two languages: Dutch and French. This ensures that prescribers can access and understand the information in their preferred language, facilitating better communication and decision-making.

8.3.1.1. Get Data to Collect

This endpoint initiates the first step in PSSa. The prescriber provides anonymized patient information, including age, gender, and the suspected indication. This ensures that PSS does not have access to the patient's identity. Based on the provided information, PSS generates a questionnaire containing support and patient variables. These variables may include a set of codes from various coding systems such as ICPC-2, ICD-10, SNOMED-CT, and ATC. The collected data will be used in the subsequent step, which involves the "Get Recommendations" endpoint described in section 8.3.1.2.

8.3.1.1.1. Endpoint

POST /PlanDefinition/GetDataToCollect/$apply

8.3.1.1.2. Request

- **Method**: POST
- **Headers**
  - **Content-Type**: application/fhir+json
  - **Accept-Language**
    - NL
    - FR
- **Payload**: A FHIR Bundle:

Bundle:

For this request, PSS applies the common resource Bundle as described in section 8.2.1.

Patient:

For this request, PSS applies the common resource Patient as described in section 8.2.2.

Condition:

Purpose: The Condition resource in this endpoint is used to describe a single clinical condition linked to the referenced patient. The prescriber can only provide one condition, which includes details such as the clinical status, verification status, category, and specific coding information. This ensures that the PSS system has a clear and focused context for generating the appropriate questionnaire and subsequent recommendations.

Field	Description
resourceType	Identifies the type as "Condition"
Id	A unique identifier for the condition
meta.profile	Specifies the canonical URL of the profile that this condition resource conforms to. This ensures the structure and content of the condition align with the CPG structure.
clinicalStatus ***- clinicalStatus.coding*** ***- clinicalStatus.coding.system*** ***- clinicalStatus.coding.code***	Indicates the condition's clinical state
verificationStatus ***- verificationStatus.coding*** ***- verificationStatus.coding.system*** ***- verificationStatus.coding.code***	Confirms the diagnostic certainty
category ***- category.coding*** ***- category.coding.system*** ***- category.coding.code***	Array of categories for the condition, represented with coding information
code ***- code.coding*** ***- code.coding.system*** ***- code.coding.code***	Code specifying the condition, represented with a coding object
subject ***- subject.reference***	A reference to the associated patient
onsetDateTime	The onset date and time of the condition

8.3.1.1.2.1. Implemented rules

The following rules apply to the Condition resource fields:

- The field ***meta.profile*** should have the following value "http://hl7.org/fhir/uv/cpg/StructureDefinition/cpg-condition"
- The field ***clinicalStatus.coding.code*** will always have the value "active"
- The field ***verificationStatus.coding.code*** will always have the value "confirmed"
- The field ***category.coding.code*** will always have the value "encounter-diagnosis"
- The field ***onsetDateTime*** has to be structured based on ISO 8601 format (YYYY-MM-DD)

8.3.1.1.2.2. Example

An example for this request can be found here:
https://www.ehealth.fgov.be/standards/fhir/pss/Bundle-getdatatocollect-a-data.html

8.3.1.1.3. Response

The response is a FHIR **Bundle** with resources required to collect patient data. Below are the key components:

Bundle:

For this response, PSS applies the common resource Bundle as described in section 8.2.1.

RequestGroup:

For this response, PSS applies the common resource RequestGroup as described in section 8.2.3.

Task

Purpose: The Task resource represents specific actions that need to be carried out as part of the data collection process. The Task resource details the task of collecting a list of patient data variables required by the PSS system. This list is specific to each indication and is necessary for PSS to derive support for the given indication. The Task resource includes fields such as status, intent, code, and input data, which provide a structured and actionable framework for the data collection process. By using the Task resource, the PSS system ensures that all required data is collected systematically and efficiently.

Field	Description
resourceType	Identifies the type as "Task"
id	A unique identifier for the task
meta.profile	Specifies the canonical URL of the profile that this task resource conforms to. This ensures the structure and content of the task align with the CPG structure.
status	Indicates the current state or progress of the task. This helps track where the task is within its lifecycle.
intent	Defines the purpose or motivation behind the task being created.
code ***- code.coding*** ***- code.coding.system*** ***- code.coding.code***	Code specifying the task, represented with a coding object (system, code, display)
for ***- for.reference***	A reference to the associated patient
input ***- input.coding*** ***- input.coding.system*** ***- input.coding.code***	Input data for the task, which includes a reference to the associated Questionnaire

input.valueReference.reference	Reference to a Questionnaire

Questionnaire

Purpose: The Questionnaire resource acts as a structured template for collecting specific data points about the patient. It includes questions, answer types, and references to valid answer sets, ensuring consistency and accuracy in the data collection process. The Questionnaire resource provides the prescriber with a detailed set of questions that need to be answered to gather the necessary support and patient variables.

In the context of PSS: Get Data to Collect, the Questionnaire is optional and depends on the indication selected earlier. For some indications, only one recommendation is returned, and no further data collection via Questionnaire is required.

Questionnaire Resource Fields

Field	Description
resourceType	Identifies the type as "Questionnaire"
id	A unique identifier for the questionnaire
meta.profile	Specifies the canonical URL of the profile that this Questionnaire resource conforms to. This ensures the structure and content of the questionnaire align with the PSS implementation guide and validation rules.
language	Language in which the questionnaire is written
status	Current status of the questionnaire
date	Date the questionnaire was created or updated
item	Top-level questions or groups of questions

Questionnaire Items

Field	Description
linkId	Unique identifier for the question within the questionnaire
text	Label or question text presented to the user
type	Type of question (e.g., boolean, choice)
required	Whether the question must be answered
repeats	Whether the question can be answered multiple times
answerOption	Possible answers (for choice-type items)
extension	Additional content, including value sets and translations
item	Nested sub-items (e.g., questions within a group)

Patient:

For this response, PSS applies the common resource Patient as described in section 8.2.2.

Commented [JD3]: I thought we would work with anonymized patients ? No rules about that to be included here?

Commented [NS4R3]: Described in 8.2.2.

8.3.1.1.3.1. Implemented rules

The following rules apply to the Task resource fields:

- The field ***meta.profile*** should have the following value "https://www.ehealth.fgov.be/standards/fhir/pss/StructureDefinition-PSSQuestionnaireTask.html"
- The field ***status*** will always have the value "requested"
- The field ***intent*** will always have the value "proposal"
- The field ***code*** will always have the value "collect-information"

The following rules apply to the Questionnaire resource fields:

- The field ***meta.profile*** should have the following value "https://www.ehealth.fgov.be/standards/fhir/pss/StructureDefinition-PSSDataAcquisitionForm.html"
- The field ***status*** will always have the value "active"

8.3.1.1.3.2. Example

An example for this request can be found here:
https://www.ehealth.fgov.be/standards/fhir/pss/Bundle-getdatatocollect-a-response.html

8.3.1.2. Get Recommendations

This endpoint represents the second step in PSSa, following the "Get Data to Collect" endpoint. In this step, the prescriber submits responses to the previously provided questionnaire. Based on these responses, PSSa generates a set of recommendations. These recommendations include various MedicationRequest and CommunicationRequest resources. Additionally, evidence links are provided, detailing the sources and guidelines upon which the recommendations are based. This ensures that the prescriber has access to evidence-based support for making informed decisions.

8.3.1.2.1. Endpoint

POST /PlanDefinition/GetRecommendations/$apply

8.3.1.2.2. Request

- **Method**: POST
- **Headers**
  - **Content-Type: application/fhir+json**
  - **Accept-Language**
    - **NL**
    - **FR**
- **Payload**: A FHIR Bundle

Bundle:

For this request, PSS applies the common resource Bundle as described in section 8.2.1.

Patient:

For this request, PSS applies the common resource Patient as described in section 8.2.2.

Condition

Purpose: Although this information was provided in the "Get Data to Collect" endpoint, it needs to be included again because the PSSa system is stateless.

Field	Description
resourceType	Identifies the type as “Condition”
Id	A unique identifier for the condition
meta.profile	Specifies the canonical URL of the profile that this condition resource conforms to. This ensures the structure and content of the condition align with the CPG structure.
clinicalStatus ***- clinicalStatus.coding*** ***- clinicalStatus.coding.system*** ***- clinicalStatus.coding.code***	Indicates the condition's clinical state
verificationStatus ***- verificationStatus.coding*** ***- verificationStatus.coding.system*** ***- verificationStatus.coding.code***	Confirms the diagnostic certainty
category ***- category.coding*** ***- category.coding.system*** ***- category.coding.code***	Array of categories for the condition, represented with coding information
code ***- code.coding*** ***- code.coding.system*** ***- code.coding.code***	Code specifying the condition, represented with a coding object
subject ***- subject.reference***	A reference to the associated patient
onsetDateTime	The onset date and time of the condition

QuestionnaireResponse:

Purpose: This resource includes detailed information about the patient's condition and other relevant data points, as reported by the prescriber or automatically extracted from the EPD system. The automatic extraction process involves matching the codes linked to a patient variable in PSS with the corresponding codes available for the patient in the EPD. This ensures that all necessary information is collected efficiently and accurately.

The QuestionnaireResponse resource ensures that PSS has access to comprehensive and up-to-date patient data, enabling it to generate tailored and evidence-based recommendations. This structured approach enhances the quality and reliability of the support provided to the prescriber.

In the context of PSS – Get Recommendations, if the Get Data to Collect response does not include a Questionnaire, then a QuestionnaireResponse must not be included in the request. This reflects the optional nature of data collection for certain indications.

Field	Description
resourceType	Identifies the type as "QuestionnaireResponse"
id	A unique identifier for the questionnaire response
meta.profile	Specifies the canonical URL of the profile that this QuestionnaireResponse resource conforms to. This ensures the structure and content of the QuestionnaireResponse align with the CPG structure.
questionnaire	Canonical reference to the Questionnaire this response answers (URL).
status	The current status of the QuestionnaireResponse
subject - ***subject.reference***	A reference to the associated patient
authored	Date and time when the response was authored (submitted).
item	Groups and questions that are part of the response; contains answers for each linkId from the Questionnaire.

Item Fields:

Each response to a question (or group) uses the item element in the **QuestionnaireResponse** resource. The structure of the response depends on the type of question defined in the corresponding **Questionnaire**:

- If the question's type is **boolean**, the response should include a valueBoolean, with the answer being either true or false.
- If the question's type is choice, the response should include a valueCoding. In this case, the selected code must be one of the predefined PSS codes that were defined in the corresponding Questionnaire. These codes must use the following system: https://www.ehealth.fgov.be/standards/fhir/pss/CodeSystem/PSSCodes

This ensures that each response is structured correctly according to the expected data type defined in the questionnaire.

Field	Description
linkId	Identifies the question from the Questionnaire (matches the linkId there)
answer	One or more answers to the question
answer.valueBoolean	Boolean value (true/false) provided as an answer
answer.valueCoding	Coded answer (e.g., selected choice from predefined options)
item (nested)	Used if there are sub-questions or nested items inside the answer (e.g., a subgroup of answers)

8.3.1.2.2.1. Implemented rules

The following rules apply to the Condition resource fields:

- The field ***meta.profile*** should have the following value "http://hl7.org/fhir/uv/cpg/StructureDefinition/cpg-condition"
- The field ***clinicalStatus.coding.code*** will always have the value "active"
- The field ***verificationStatus.coding.code*** will always have the value "confirmed"
- The field ***category.coding.code*** will always have the value "encounter-diagnosis"
- The field ***onsetDateTime*** has to be structured based on ISO 8601 format (YYYY-MM-DD)

The following rules apply to the QuestionnaireResponse resource fields:

- The field ***meta.profile*** should have the following value "http://hl7.org/fhir/uv/cpg/StructureDefinition/cpg-questionnaireresponse"
- The field ***status*** will always have the value "completed"
- The field ***authored*** has to be structured based on ISO 8601 format (YYYY-MM-DD)

8.3.1.2.2.2. Example

An example for this request can be found here:
https://www.ehealth.fgov.be/standards/fhir/pss/1.0.0/Bundle-getrecommendations-a-data.html

8.3.1.2.3. Response

The response is a FHIR **Bundle** with resources to list the recommendations. Below are the key components:

Bundle:

For this response, PSS applies the common resource Bundle as described in section 8.2.1.

RequestGroup:

For this response, PSS applies the common resource RequestGroup as described in section 8.2.3.

CommunicationRequest

Purpose: The CommunicationRequest in this context serves as a vehicle for conveying clinical guidance, clarifications, or rationale as part of a recommendation. It enables computable clinical decision support systems like PSSa to provide contextual communication messages to the care team. These messages may contain warnings, educational advice, or supporting information that inform or justify clinical decisions. In CPG-based systems, it complements structured recommendations (e.g., MedicationRequest) by delivering human-readable narrative that supports transparency and trust in automated recommendations.

Field	Description
resourceType	Identifies the type as "CommunicationRequest"
id	A unique identifier for the communication request

meta.profile	Specifies the canonical URL of the profile that this CommunicationRequest resource conforms to. This ensures the structure and content of the CommunicationRequest align with the PSS implementation guide and validation rules.
status	Status of the communicationrequest
subject ***- subject.reference***	A reference to the associated patient
payload	Contains the actual communication content, typically advice or explanation.
payload.contentString	Text of the message to communicate, such as guideline clarifications or warnings.

MedicationRequest

Purpose: This resource includes essential information such as the status, intent, and details about the medication, including dosage instructions. Additionally, it contains extensions with clinical practice guideline (CPG) ratings, which support the recommendations with relevant clinical evidence. By including the MedicationRequest resource, PSSa ensures that prescribers receive comprehensive and evidence-based medication proposals tailored to the patient's specific clinical scenario.

Field	Description
resourceType	Identifies the type as "MedicationRequest"
id	A unique identifier for the medication request
meta.profile	Specifies the canonical URL of the profile that this MedicationRequest resource conforms to. This ensures the structure and content of the MedicationRequest align with the PSS implementation guide and validation rules.
status	Status of the request
intent	The intent of the request
medicationCodeableConcept	Details about the medication being requested (with codes from e.g., ATC, local systems)
subject ***- subject.reference***	A reference to the associated patient
dosageInstruction	How the medication should be administered to the patient
dosageInstruction.text	Text summary of how the medication should be taken
dosageInstruction.timing	Scheduling information
dosageInstruction.timing.repeat.boundDuration	Duration over which the medication is to be administered
dosageInstruction.timing.repeat.frequency	Number of times the medication is taken per period
dosageInstruction.timing.repeat.period	Period length

dosageInstruction.timing.repeat.periodUnit	Units of the period
dosageInstruction.doseAndRate	Dosage quantity and optionally the rate at which the medication should be administered.
dosageInstruction.doseAndRate.doseQuantity.value	Amount of medication per dose
dosageInstruction.doseAndRate.doseQuantity.unit	Unit of measure for the dose

Patient:

For this response, PSS applies the common resource Patient as described in section 8.2.2.

8.3.1.2.3.1. Implemented rules

The following rules apply to the CommunicationRequest resource fields:

- The field ***meta.profile*** should have the following value "https://www.ehealth.fgov.be/standards/fhir/pss/StructureDefinition-PSSResponseCommunicationRequest.html"
- The field ***status*** will always have the value "active"

The following rules apply to the MedicationRequest resource fields:

- The field ***meta.profile*** should have the following value "https://www.ehealth.fgov.be/standards/fhir/pss/StructureDefinition-PSSMedicationRequest.html"
- The field ***status*** will always have the value "active"
- The field ***intent*** will always have the value "proposal"

8.3.1.2.3.2. Example

An example for this request can be found here:
https://www.ehealth.fgov.be/standards/fhir/pss/1.0.0/Bundle-getrecommendations-a-response.html

8.3.2. Operations on Radiology

PSSr aims to assist prescribers in making informed decisions regarding radiology referrals. This support is provided through a series of steps, starting with obtaining a list of possible diagnoses based on patient information such as age, gender, structured or free text indications, and optionally a ServiceRequest. The collected data will be used to generate recommendations based on the selected diagnoses. All information, including diagnoses, recommendations, and evidence links, will be provided in the language the prescriber is using in their system. This ensures that prescribers can

access and understand the information in their preferred language, facilitating better communication and decision-making.

8.3.2.1. Get Diagnoses

This endpoint initiates the first step in the Prescription Search Support for Radiology (PSSr). The prescriber provides anonymized patient information, including age, gender, and suspected indications, which can be structured or free text. Optionally, a ServiceRequest can also be included. Based on this information, PSSr generates a list of possible diagnoses related to the provided parameters. This ensures that PSSr does not have access to the patient's identity. The collected data will be used in the subsequent step, which involves the "Get Recommendations" endpoint described in section 8.3.2.2.

8.3.2.1.1. Endpoint

POST /PlanDefinition/GetDiagnoses/$apply

8.3.2.1.2. Request

- **Method**: POST
- **Headers**
  - **Content-Type: application/fhir+json**
  - **Accept-Language**
    - **NL**
    - **FR**
- **Payload**: A FHIR Bundle

Bundle:

For this request, PSS applies the common resource Bundle as described in section 8.2.1.

Patient:

For this request, PSS applies the common resource Patient as described in section 8.2.2.

Observation:

Purpose: The Observation resource represents clinical observations made by the prescriber, such as symptoms or findings like head trauma, headache, etc. In the context of the "Get Diagnoses" endpoint request, the Observation resource provides detailed information about the patient's current health status as observed by the prescriber. This information is crucial for generating accurate and relevant diagnoses. The resource includes fields such as status, code, and subject reference, ensuring that the information is structured and standardized.

Field	Description
resourceType	Identifies the type as “Observation”
id	A unique identifier for the observation

status	The status of the observation
code ***- code.coding*** ***- code.coding.system*** ***- code.coding.code***	Code specifying the observation, represented with a coding object
subject ***- subject.reference***	A reference to the associated patient

ServiceRequest:

Purpose: The ServiceRequest resource represents an optional request for healthcare procedures. It reflects the initial thought of the prescriber regarding the best course of action. In the context of the "Get Diagnoses" endpoint request, the ServiceRequest resource provides details about the specific procedures being considered, including the status, intent, and description of the procedure. By running PSSr, the system evaluates whether this initial thought is indeed the best solution or if there are better alternative procedures. This helps ensure that the generated diagnoses and subsequent recommendations are optimal for the patient's needs.

Field	Description
resourceType	Identifies the type as “ServiceRequest”
id	A unique identifier for the service request
meta.profile	Specifies the canonical URL of the profile that this ServiceRequest resource conforms to. This ensures the structure and content of the ServiceRequest align with the PSS implementation guide and validation rules.
status	The status of the service request
intent	The intent of the service request
code ***- code.coding*** ***- code.coding.system*** ***- code.coding.code***	Code specifying the ServiceRequest, represented with a coding object
subject ***- subject.reference***	A reference to the associated patient

8.3.2.1.2.1. Implemented rules

The following rules apply to the Observation resource fields:

- The field ***status*** will always have the value “final”

The following rules apply to the ServiceRequest resource fields:

- The field ***meta.profile*** should have the following value “https://www.ehealth.fgov.be/standards/fhir/pss/StructureDefinition-PSSResponseServiceRequest.html”
- The field ***status*** will always have the value “active”
- The field ***intent*** will always have the value “proposal”

8.3.2.1.2.2. Example

An example for this request can be found here:
https://www.ehealth.fgov.be/standards/fhir/pss/Bundle-radiology-getdiagnoses.html

8.3.2.1.3. Response

Bundle:

For this response, PSS applies the common resource Bundle as described in section 8.2.1.

RequestGroup:

For this response, PSS applies the common resource RequestGroup as described in section 8.2.3.

Task

Purpose: The Task resource represents specific actions that need to be carried out as part of the diagnostic process. The Task resource details the possible diagnoses that match the patient's health status. Each task represents a potential diagnosis and includes a reference to a Condition resource. The prescriber must select one or multiple conditions from these tasks in the next step, which involves the "Get Recommendations" endpoint. This resource includes fields such as status, intent, code, and input data, providing a structured and actionable framework for the diagnostic process.

Field	Description
resourceType	Identifies the type as “Task”
id	A unique identifier for the task
status	The status of the Task
intent	The intent of the Task
code ***- code.coding*** ***- code.coding.system*** ***- code.coding.code***	Code specifying the condition, represented with a coding object
for ***- for.reference***	A reference to the associated patient
input ***- input.coding*** ***- input.coding.system*** ***- input.coding.code***	Input data for the task, which includes a reference to the associated Questionnaire
input.valueReference.reference	Reference to a condition

Condition:

Purpose: The Condition resource in the "Get Diagnoses" endpoint response is used to describe a clinical condition linked to the referenced patient. This resource includes details such as the clinical status, verification status, category, and specific coding information. By providing the Condition resource, the PSSr system ensures that the generated diagnoses are based on accurate and relevant clinical information.

Field	Description
resourceType	Identifies the type as “Condition”
id	A unique identifier for the condition
meta.profile	Specifies the canonical URL of the profile that this condition resource conforms to. This ensures the structure and content of the condition align with the CPG implementation guide and validation rules.
clinicalStatus ***- clinicalStatus.coding*** ***- clinicalStatus.coding.system*** ***- clinicalStatus.coding.code***	Indicates the condition's clinical state
verificationStatus ***- verificationStatus.coding*** ***- verificationStatus.coding.system*** ***- verificationStatus.coding.code***	Confirms the diagnostic certainty
category ***- category.coding*** ***- category.coding.system*** ***- category.coding.code***	Array of categories for the condition, represented with coding information
code ***- code.coding*** ***- code.coding.system*** ***- code.coding.code***	Code specifying the condition, represented with a coding object
subject ***- subject.reference***	A reference to the associated patient
onsetDateTime	The onset date and time of the condition

8.3.2.1.3.1. Implemented rules

The following rules apply to the Task resource fields:

- The field ***status*** will always have the value “requested”
- The field ***intent*** will always have the value “proposal”
- The field ***code*** will always have the value “propose-diagnosis”

The following rules apply to the Condition resource fields:

- The field ***meta.profile*** should have the following value “http://hl7.org/fhir/uv/cpg/StructureDefinition/cpg-condition”
- The field ***clinicalStatus*** will always have the value “active”
- The field ***verificationStatus*** will always have the value “provisional”
- The field ***category*** will always have the value “problem-list-item”
- The field ***onsetDateTime*** has to be structured based on ISO 8601 format (YYYY-MM-DD)

8.3.2.1.3.2. Example

An example for this request can be found here:
https://www.ehealth.fgov.be/standards/fhir/pss/Bundle-radiology-getdiagnoses-response.html

8.3.2.2. Get Recommendations

This endpoint represents the second step in PSSr following the "Get Diagnoses" endpoint. In this step, the prescriber submits the selected diagnoses from the previously provided list. Based on these selections, PSSr generates a set of recommendations. These recommendations include various ServiceRequest resources and evidence links, detailing the sources and guidelines upon which the recommendations are based. This ensures that the prescriber has access to evidence-based support for making informed referral decisions. All information will be available in the language the prescriber is using in their system.

8.3.2.2.1. Endpoint

POST /PlanDefinition/GetRecommendations/$apply

8.3.2.2.2. Request

- **Method**: POST
- **Content-Type**: application/fhir+json
- **Payload**: A FHIR Bundle

Bundle:

For this request, PSS applies the common resource Bundle as described in section 8.2.1.

Patient:

For this request, PSS applies the common resource Patient as described in section 8.2.2.

Condition

Purpose: By including one or multiple conditions, the PSSr system can generate accurate and relevant recommendations tailored to the patient's specific clinical scenario. The Condition resource ensures that the recommendations are based on up-to-date and precise clinical data.

Field	Description
resourceType	Identifies the type as “Condition”
id	A unique identifier for the condition
meta.profile	Specifies the canonical URL of the profile that this condition resource conforms to. This ensures the structure and content of the condition align with the CPG implementation guide and validation rules.
clinicalStatus	Indicates the condition's clinical state

- clinicalStatus.coding ***- clinicalStatus.coding.system*** ***- clinicalStatus.coding.code***	
verificationStatus ***- verificationStatus.coding*** ***- verificationStatus.coding.system*** ***- verificationStatus.coding.code***	Confirms the diagnostic certainty
category ***- category.coding*** ***- category.coding.system*** ***- category.coding.code***	Array of categories for the condition, represented with coding information
code ***- code.coding*** ***- code.coding.system*** ***- code.coding.code***	Code specifying the condition, represented with a coding object
subject ***- subject.reference***	A reference to the associated patient
onsetDateTime	The onset date and time of the condition

ServiceRequest:

Purpose: Although this information was provided in the "Get Diagnoses" endpoint, it needs to be included again because the PSSr system is stateless.

Field	Description
resourceType	Identifies the type as “ServiceRequest”
id	A unique identifier for the service request
status	The status of the service request
intent	The intent of the service request
code ***- code.coding*** ***- code.coding.system*** ***- code.coding.code***	Code specifying the ServiceRequest, represented with a coding object
subject ***- subject.reference***	A reference to the associated patient

8.3.2.2.2.1. Implemented rules

The following rules apply to the Condition resource fields:

- The field ***meta.profile*** should have the following value “http://hl7.org/fhir/uv/cpg/StructureDefinition/cpg-condition”
- The field ***clinicalStatus*** will always have the value “active”
- The field ***verificationStatus*** will always have the value “provisional”
- The field ***category*** will always have the value “problem-list-item”
- The field **onsetDateTime** has to be structured based on ISO 8601 format (YYYY-MM-DD)

The following rules apply to the ServiceRequest resource fields:

- The field ***meta.profile*** should have the following value "https://www.ehealth.fgov.be/standards/fhir/pss/StructureDefinition-PSSResponseServiceRequest.html"
- The field ***status*** will always have the value "active"
- The field ***intent*** will always have the value "proposal"

8.3.2.2.2. Example

An example for this request can be found here:
https://www.ehealth.fgov.be/standards/fhir/pss/Bundle-getrecommendations-data3.html

8.3.2.2.3. Response

Bundle:

For this request, PSS applies the common resource Bundle as described in section 8.2.1.

RequestGroup:

For this response, PSS applies the common resource RequestGroup as described in section 8.2.3.

ServiceRequest:

Purpose: The ServiceRequest resource in the GetRecommendations endpoint response is used to provide a list of recommended procedures based on the selected conditions. This resource includes essential details such as the status, intent, and description of the requested service. If the prescriber provided an optional ServiceRequest at the beginning, it will be included in the list along with other recommended options that may have a better score. By including this information, the PSSr system ensures that the prescriber receives a comprehensive set of evidence-based recommendations, allowing them to make informed decisions about the most appropriate radiology referrals for their patients.

Field	Description
resourceType	Identifies the type as "ServiceRequest"
id	A unique identifier for the service request
meta.profile	Specifies the canonical URL of the profile that this ServiceRequest resource conforms to. This ensures the structure and content of the ServiceRequest align with the PSS implementation guide and validation rules.
identifier.value	An internal identifier for the service request
status	The status of the service request
intent	The intent of the service request
code ***- code.coding*** ***- code.coding.system*** ***- code.coding.code***	Code specifying the ServiceRequest, represented with a coding object

subject ***- subject.reference***	A reference to the associated patient

8.3.2.2.3.1. Implemented rules

The following rules apply to the ServiceRequest resource fields:

- The field ***meta.profile*** should have the following value "https://www.ehealth.fgov.be/standards/fhir/pss/StructureDefinition-PSSResponseServiceRequest.html"
- The field ***status*** will always have the value "active"
- The field ***intent*** will always have the value "proposal"

8.3.2.2.3.2. Example

An example for this request can be found here:
https://www.ehealth.fgov.be/standards/fhir/pss/Bundle-getrecommendations-r-response.html

9. Error management

In the cycle of search support, PSS API allows different type of requests and multiple different actors can interact with the API. If there is an error in the request, or if the action is forbidden by the system, PSS sends back an error. This section documents how errors will be represented by PSS. Alongside the correct HTTP code, PSS uses the FHIR resource OperationOutcome which is defined by FHIR to display the error.

An error can appear for different reasons. The errors returned by PSS are structured in a specific way to allow the end-user to quickly understand where the errors come from.

PSS uses issues with fields :

- **severity**: defines if this is an "error" or a "warning". (https://hl7.org/fhir/r4b/valueset-issueseverity.html)
- **code**: FHIR error type. PSS uses (business-rule, value, security, forbidden, conflict, processing). (https://hl7.org/fhir/r4b/valueset-issue-type.html)
- **details.coding.system**: The system where the error is defined. Errors thrown and defined by PSS are in the system "urn:pss:errors"
- **details.coding.code**: The code that defines the error. In the document, it is referenced as the PSS code
- **diagnostics**: Contains the description of the PSS code to help understanding. It should always be the same message for one PSS code. This message ends with an error id that can used for support purpose since this error is logged and more information can be retrieved by the PSS team through the error tracking system of PSS.

All error messages returned by PSS are listed in the Excel document "PSS_API_ErrorCodes.xlsx" alongside this cookbook.

10. Antimicrobial domain: front-end requirements

This chapter outlines the front-end requirements and best practices for implementing two key components: 1) the Patient Situation Module, and 2) the PSS Recommendations Viewer, both specifically designed for the antimicrobial domain. Its goal is to guide software integrators in building a user-friendly, interoperable interface capable of accurately handling the unique cases and complexities within the antimicrobial field.

10.1. Disclaimer

When a professional uses PSS Antimicrobial for the first time, a disclaimer must be displayed. The user should have the option to confirm that they have read the disclaimer and choose to 'not show it again'. The development of the disclaimer pop-up is the responsibility of the integrators.

The disclaimer should contain the following content:

Language	Disclaimer content
NL	De aanbevelingen zijn gebaseerd op de Belgische gids voor anti-infectieuze behandeling in de ambulante praktijk, uitgegeven door BAPCOC en kunnen dus enkel gebruikt worden voor dit en gelijkaardige toepassingsgebieden. De aanbevelingen dienen slechts ter ondersteuning bij het voorschrijven en zijn geen vervanging van de medische expertise van de voorschrijver.
FR	Les recommandations sont basées sur le guide belge de traitement anti-infectieux en pratique ambulatoire, publié par BAPCOC et ne peuvent donc être utilisées que pour ce domaine d'application et des domaines d'application similaires. Les recommandations sont uniquement destinées à aider à la prescription et ne remplacent pas l'expertise médicale du prescripteur.
DE	Die Empfehlungen basieren auf dem belgischen Leitfaden für die antiinfektiöse Behandlung in der ambulanten Praxis, herausgegeben von BAPCOC, und können daher nur für diesen und ähnliche Anwendungsbereiche verwendet werden. Die Empfehlungen sollen lediglich als Hilfestellung bei der Verschreibung dienen und ersetzen nicht die medizinische Fachkompetenz des verschreibenden Arztes.
EN	The recommendations are based on the Belgian guide for anti-infectious treatment in outpatient practice, published by BAPCOC and can therefore only be used for this and similar areas of application. The recommendations are only intended to support prescribing and are not a substitute for the medical expertise of the prescriber.

10.2. Patient situation

The patient situation includes all relevant Support Parameters and Patient Variables for the specified indication. The values for these parameters and variables must be automatically prefilled based on the patient data registered in the EPD. The user must review and, if necessary, adjust the values before confirming the patient situation to continue with the process.

10.2.1 Guidance

A clear guidance message should be displayed to the user. This should be located above the support parameters and patient variables. This message provides essential instructions and context to help the user understand what is expected:

Language	Guidance message content
NL	Gelieve alle parameters te controleren en te wijzigen indien nodig. De vooraf ingevulde waarden komen uit het patiëntendossier.
FR	Veuillez vérifier tous les paramètres et modifier si nécessaire. Les valeurs préremplies viennent du dossier patient.
DE	Bitte überprüfen Sie alle Parameter und ändern Sie sie bei Bedarf. Die vorausgefüllten Werte stammen aus der Patientenakte.
EN	Please check all parameters and adjust if necessary. The pre-filled values come from the patient record.

Note: The instruction should not be displayed when there is only one recommendation linked to the indication, as in this case, no Support Parameters or Patient Variables are shown to the user.

Below the guidance message, all relevant Support Parameters and Patient Variables for the specific indication should be presented. The prescriber must be able to view all relevant data elements immediately, without the need for additional clicks or navigation.

This requirement applies to all types of support parameters, which are categorized as follows:

- **General Support Parameters** (prefix: *sp_*)
- **Exclusive Support Parameters** (prefix: *sp_exc_*)
- **Exclusive Mandatory Support Parameters** (prefix: *sp_excMand_*)

Patient Variables (prefix: *pv_*) may be linked to these different types of parameters. When no codes are linked to a Patient Variable or Support Parameter, they are referred to as "manual observable entities."

Detailed requirements for each type of parameter are outlined in the following chapters.

10.2.2 Support Parameters (sp_)

Support parameters are identified by the prefix 'sp_' (e.g., 'sp_penicillinAllergy'). This prefix serves as a clear indicator for recognizing and differentiating support parameters within the system.

10.2.3 Patient Variables (pv_)

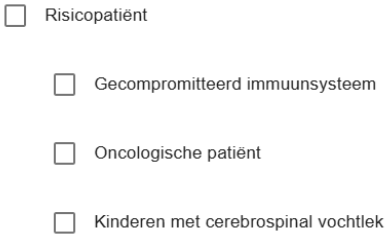
Patient Variables can be linked to Support Parameters.

If a single Patient Variable is associated with a Support Parameter and the label of the Patient Variable is identical to the Support Parameter label, excluding the 'sp_' or 'pv_' prefix, then the Patient Variable should not be displayed to avoid redundant information being presented to the user.

Example : if the Patient Variable 'pv _penicillinAllergy' is linked to the Support Parameter 'sp_penicillinAllergy' for the indication ACUTE_BRONCHITIS_VOLWASSENEN, and it is the only Patient Variable for that Support Parameter, then the Patient Variable should not be shown, as it duplicates the information already provided by the Support Parameter.

When multiple Patient Variables are linked to a Support Parameter, the hierarchical relationship should be clearly indicated through visual indentation. In this context, the Support Parameter is considered the 'parent' level, and the linked Patient Variables are considered the 'child' level.

Example : if three Patient Variables — 'pv_compromisedImmuneSystem' and 'pv_oncologyPatient' and 'pv_cWithCerebrospinalFluid_arh' — are linked to the Support Parameter ' 'sp_riskPatient_arh' for the indication ACUTE_RHINOSINUSITIS, then the hierarchy should be clearly displayed with the Support Parameter at the parent level and the Patient Variables indented beneath it as child elements.



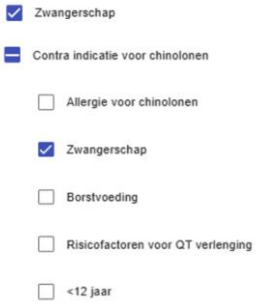
There may be instances where no Patient Variables are linked to a Support Parameter.

Example: there are no Patient Variables linked to the Support Parameter 'sp_alarmingSymptoms_aec' for the indication ACUTE_EXACERBATIES_VAN_COPD:

It is possible for the same Patient Variable to be linked to two different Support Parameters.

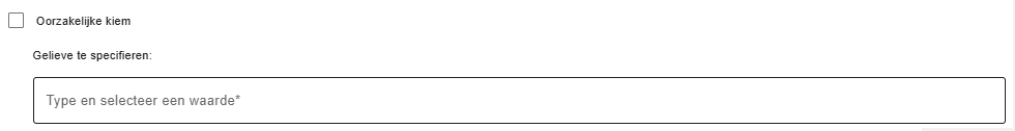
When one of these Patient Variables is selected (set to 'TRUE'), the change should automatically apply to the corresponding Patient Variable linked to the other Support Parameter.

For example, if the Patient Variable 'pv_pregnant' is linked to both the Support Parameters 'sp_pregnant' and 'sp_contraIndicationChinolonen' for the indication ACUTE_PYELONEPHRITIS, selecting one of these variables (setting it to 'TRUE') will automatically update the state of the other linked Patient Variable."



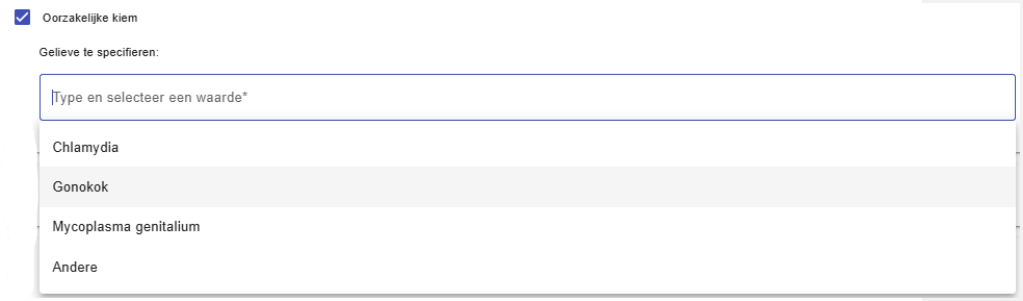
10.2.4 Exclusive Support Parameters (sp_exc_)

When an Exclusive Support Parameter (sp_exc_) is checked (set to 'TRUE'), it is mandatory to specify a corresponding Patient Variable value. The user must provide this value to proceed, as it is required for the proper configuration of the system.



Only one Patient Variable value can be selected for this type of parameter. To ensure ease of selection, the Patient Variables linked to this parameter should ideally be presented in a dropdown list.

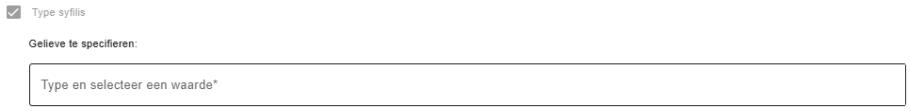
Example: when configuring the Support Parameter "sp_exc_causalPathogen_ure" for the indication URETHRITIS, it is mandatory to select one of the Patient Variables from the dropdown menu:



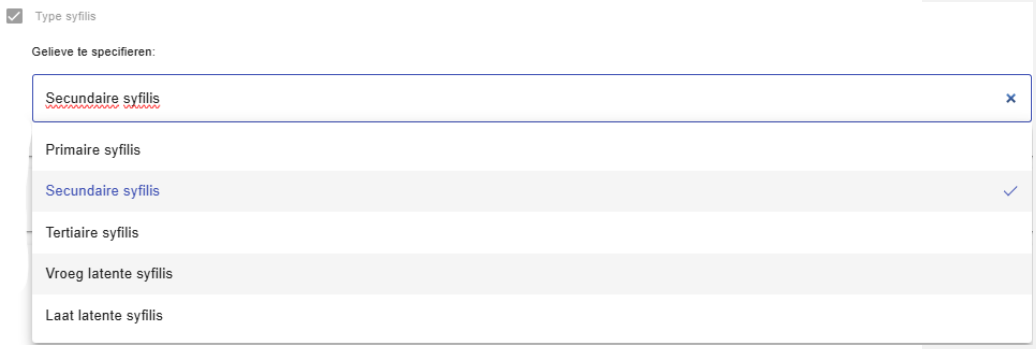
10.2.5 Exclusive Mandatory Support Parameters (sp_excMand_)

Exclusive Mandatory Support Parameters are identified by the prefix "sp_excMand_". It is always mandatory to provide a value for this type of Support Parameter. These parameters must be checked by default and cannot be manually unchecked by the user.

Example: for the Support Parameter "sp_excMand_typeSyfilis" for the indication SYFILIS, it is required to select one of the available Patient Variables, and the parameter will be checked automatically without the option to uncheck it.



For Exclusive Mandatory Support Parameters, it is mandatory to select a Patient Variable value. Only one Patient Variable value can be chosen for this type of parameter. To facilitate this selection, the linked Patient Variables should ideally be presented in a dropdown list, ensuring a streamlined and error-free user experience.



10.2.6 No parameters applicable - only 1 recommendation available

For certain indications, such as *Influenza*, no support parameters or patient variables are required to provide the recommendation. In these cases, only one recommendation is available for the indication. A message should be displayed to inform the user that no additional parameters or variables are needed for this recommendation.

Language	Message to inform that there is only 1 recommendation
NL	Voor deze indicatie is er maar één aanbeveling mogelijk.
FR	Pour cette indication, il n'y a qu'une seule recommandation possible.
DE	Für diese Indikation gibt es nur eine mögliche Empfehlung.
EN	There is only one possible recommendation for this indication.

10.3. Manually override patient situation

It is important to visually distinguish between values that were automatically retrieved from the patient's data in the EPD (Electronic Patient Database) and values that have been manually overridden by the prescriber.

- **For parameters or variables with auto-filled values**: Display a label below the parameter/variable when the user manually unchecks a value that was pre-selected based on a match with a code found in the EPD. The label should only appear if the user unchecks a checkbox that was automatically checked due to an EPD code match.
- **For Exclusive and Exclusive Mandatory Parameters**: Display the label when the user selects a different patient variable value from a dropdown, overriding the value that was prefilled based on a code found in the EPD.

Language	Message to inform about manual adjustment
NL	Manuele aanpassing van waarde opgehaald uit het patiëntdossier
FR	Modification manuelle de la valeur récupérée du dossier patient
DE	Manuelle Anpassung des aus der Patientenakte abgerufenen Wertes
EN	Manual adjustment of value retrieved from patient file

Overview of cases for displaying manual override labels

Below is an overview of the different scenarios when the label should (or should not) be displayed to indicate that a value has been manually overridden.

Case 1: Support Parameter linked to code

Given the EPD software integrator requests support for "ACUTE_BRONCHITIS_VOLWASSENEN"
And finds a match with the code for support parameter “sp_penicillinAllergy” (code found "Z88.0")
And the prescriber consults the patient situation
Then the support parameter “sp_penicillinAllergy” is automatically checked based on EPD code match
When the prescriber unchecks the parameter
Then the label should be displayed below the support parameter to indicate that the value, which was pre-checked based on the EPD code, has been manually unchecked.

Case 2: Patient Variable linked to code

Given the EPD software integrator requests support for "ACUTE_BRONCHITIS_VOLWASSENEN "
And finds a match with the code for patient variable “pv_oncologyPatient” (for example “R85”)
And “pv_oncologyPatient” is linked to support parameter “sp_riskPatient_aab”
And the prescriber consults the patient situation
Then the patient variable “pv_oncologyPatient" is automatically checked based on the EPD code match
When the prescriber unchecks the patient variable
Then the label should be displayed below the patient variable to indicate that the value, which was pre-checked based on the EPD code, has been manually unchecked.

Case 3: Manual observable entity

Given that a manual observable entity is not linked to a code, it is not applicable for automatic retrieval from the EPD. The label is thus never shown as the value cannot be retrieved from the EPD.

Case 4.a: Exclusive parameter – uncheck support parameter

Given the EPD software integrator requests support for "URETHRITIS"
And finds a match with the code for patient variable "pv_causalPatChlamydia_ure "

And the prescriber consults the patient situation
Then the patient variable "pv_causalPatChlamydia_ure" is already selected from the dropdown
And the support parameter "sp_exc_causalPathogen_ure " is also checked based on the EPD data

When the prescriber unchecks the support parameter
Then the label should be displayed below the dropdown to indicate that the value, which was prechecked based on the EPD, has been manually modified.

Case 4.b: Exclusive parameter – change patient variable
Given the EPD software integrator requests support for "URETHRITIS"
And finds a match with the code for patient variable "pv_causalPatChlamydia_ure"
And the prescriber consults the patient situation
Then the patient variable "pv_causalPatChlamydia_ure" is already selected from the dropdown
And the support parameter "sp_exc_causalPathogen_ure " is also checked based on the EPD data

When the prescriber changes the patient variable from "pv_causalPatChlamydia_ure"
to "pv_causalPatGonokok_ure"
Then the label should be displayed below the dropdown to indicate that the value, that was originally retrieved from the EPD, has been manually modified.

Case 5: Exclusive mandatory parameter
This case does not apply at the support parameter level, as Exclusive Mandatory Parameters are

always checked by default and cannot be manually unchecked. The Support Parameter is preset to 'TRUE,' and it is mandatory to specify a corresponding Patient Variable.

However, the requirement to display the label still applies if user adapts the patient variable:

Given the EPD software integrator requests support for "SYFILIS"
And finds a match with the code for patient variable "pv_primarySyfilis"
And the prescriber consults the patient situation
Then the patient variable "pv_primarySyfilis" is already selected from the dropdown
When the prescriber unselects the patient variable
Then it is mandatory to select another patient variable, as this is an exclusive mandatory parameter
And when the user selects a value that is different from the value that was retrieved from the EPD (for example "pv_secundarySyfilis")
Then the label should be displayed below the patient variable to indicate that the value, initially retrieved from the EPD, has been manually modified.

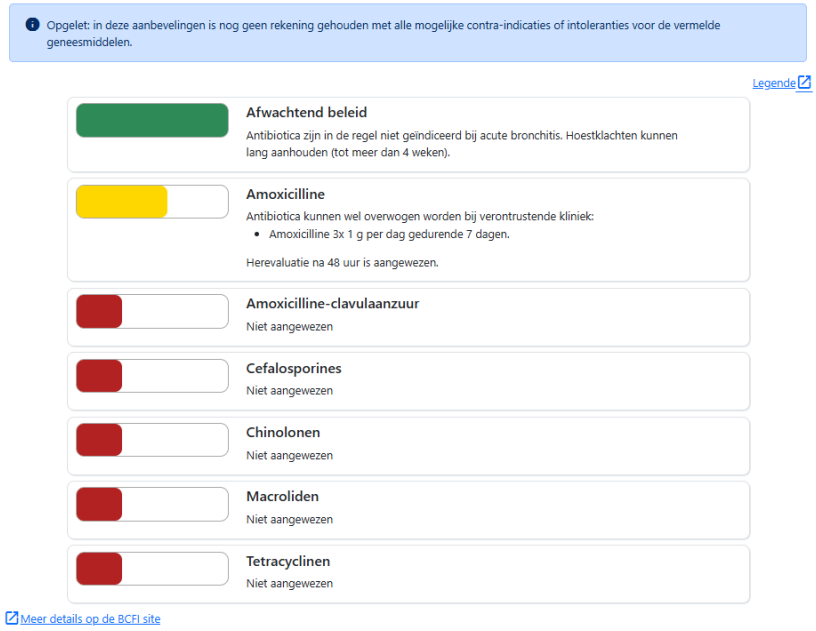
10.4. Patient situation summary

Important Note: *We are currently exploring a solution within FHIR to return the Support Parameter Values calculated based on the Patient Variable values during the support derivation process. This capability is essential for enabling integrators to display a summary of the patient's clinical situation. While this feature is already available in the web components, it is not yet supported in FHIR.*

The summary will include all support parameters and patient variables marked as TRUE for the patient the selected indication, providing prescribers with a quick overview of the relevant clinical data used to derive support.

If no support parameters are associated with the selected indication, or if none are applicable to the patient, a specific message will be shown in the web component to inform the user and prevent confusion.

10.5. Recommendations



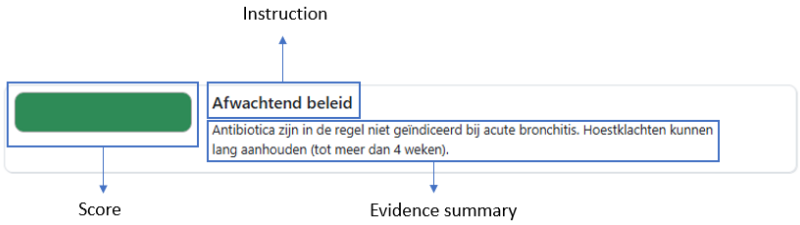
10.5.1 Disclaimer

An information disclaimer must be displayed in alignment with the visual styling and standards of the integrator's system. This ensures consistency in user experience and clear communication of the advisory nature of the information.

10.5.2 Support options

The system presents a list of support options as part of the PSS result. There is at least one support option available for display. Each support option includes the following elements:

- **Score**
- **Instruction**
- **Evidence Summary**



Scoring System
In the antimicrobial domain, the support options are scored using a three-tier system:

- **Score 3** – Green bar: Generally recommended
- **Score 2** – Yellow bar: Possibly recommended
- **Score 1** – Red bar: Not recommended

In addition to using color coding, we recommend incorporating an extra visual indicator to ensure accessibility for users with color vision deficiencies. For example, the length of the filled portion of a scoring bar can vary by score, offering a non-color-based visual cue. Or by adding the text “generally recommended”, “possibly recommended” or “not recommended” in the tab.

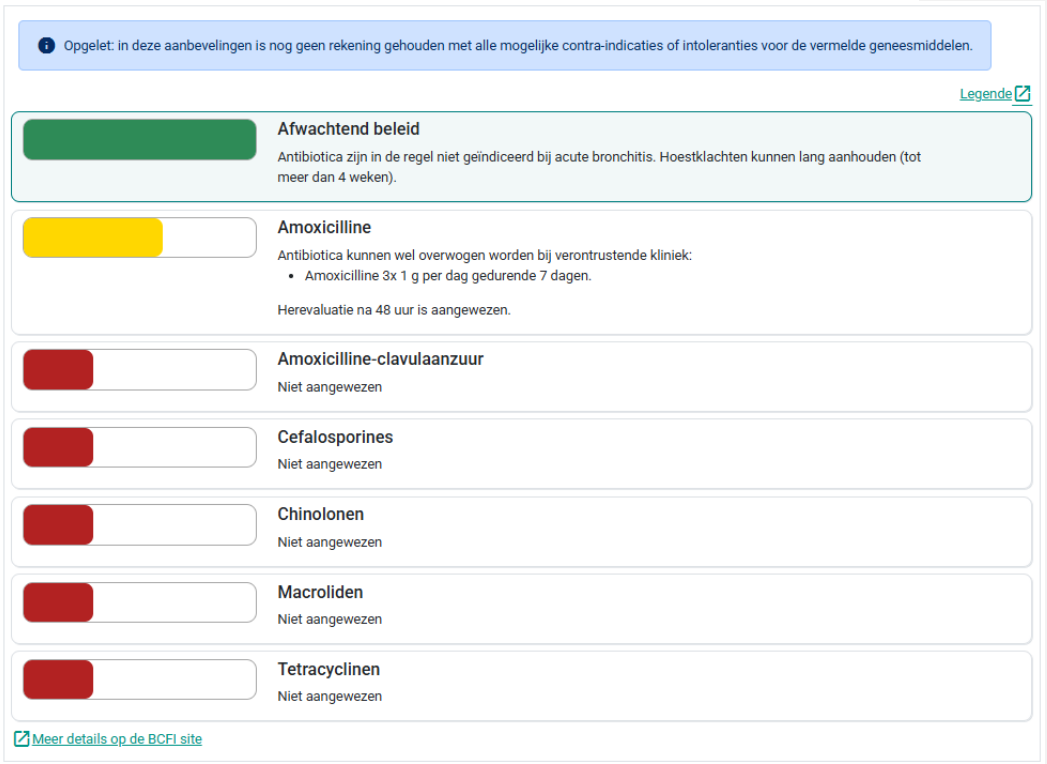
Instruction
The instruction (e.g., “Amoxicillin”) should be displayed in **bold** to attract attention and enhance the readability of the recommendations.

Evidence Summary
The formatting of the evidence summary must comply with the styles and standards defined by the guideline managers. The summary may include:

- **Bold** and *italic* text
- Bullet points
- Hyperlinks

Interactivity
Each support option must be clickable, enabling the user to register their conclusion or selection directly.

Example: The support table in the example displays seven support options. All the support options are fully clickable. When the user hovers over the first option, then the first support option is highlighted, indicating that it can be selected.



Links to Additional Information

Below the support table, one or more links are provided to redirect the user to additional resources hosted on external platforms such as BAPCOC or EBPracticenet. These links offer access to detailed guidelines, clinical background information, and supporting evidence.

To ensure clarity and set the right expectations for the user, each link should be accompanied by a relevant icon—for example, an external link icon—to clearly indicate that the user will be redirected to an external website.

These visual cues help improve the user experience by providing intuitive guidance and reducing confusion about the nature of the content behind the links.

Each of the links to additional information, when clicked, opens the information in a new tab.

10.5.3 Scoring system legend

To help users interpret the scoring system correctly, a legend should be provided that explains the meaning of the different color-coded categories (green, yellow, red). This ensures that users clearly understand how to interpret the recommendations based on their score.

The entry point for this legend should be a clickable link, which is placed in close proximity to the recommendations section. Clicking on this link allows users to open a pop-up window containing the legend.

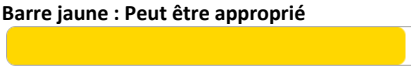
The clickable text for this link can be:

- “Legende” in Dutch
- “Légende” in French

Placing the link near the recommendations ensures it is easily discoverable and contextually relevant, enhancing usability and comprehension.

The pop-up should clearly describe each score level:

- **Green (Score 3)** – Green bar: Generally recommended
- **Yellow (Score 2)** – Yellow bar: Less recommended
- **Red (Score 1)** – Red bar: Not recommended

Language	Content of the legend
NL	**Wat betekenen de aanbevelingen?** Alle aanbevelingen in PSS zijn gebaseerd op de Belgische gids voor anti-infectieuze behandeling in de ambulante praktijk (BAPCOC). **Groene balk: Over het algemeen aangewezen**  Hier vindt u behandelingen die het meest aangewezen zijn: • Het kan gaan om één of meerdere evenwaardige behandelingen voor uw patiënt. Maak vrij een keuze uit een van de beschreven opties. • U kunt er ook adviezen terugvinden die complementair zijn aan specifieke behandelingen voor uw patiënt. Het kan bijvoorbeeld gaan om de behandeling van partners, symptoombehandeling, doorverwijzing naar een specialist,... **Gele balk: Mogelijk aangewezen**  Dit betekent dat de voorgestelde behandeling geschikt is in specifieke omstandigheden: • Het gaat meestal om één of meer behandelingen van tweede keuze, of • Het is een te overwegen behandeling waarvoor u rekening moet houden met de toegevoegde instructies of specificaties omschreven in de aanbeveling. Vindt u meerdere behandelingsvoorstellen, zijn ze altijd evenwaardig. **Rode balk: Niet aangewezen**  Dit betekent dat de behandeling niet is aangewezen voor de ingegeven indicatie en patiëntparameters.
FR	**Que signifient les recommandations?** Toutes les recommandations que vous trouverez dans PSS sont basées sur le guide belge du traitement anti-infectieux en pratique ambulatoire (BAPCOC). **Barre verte : Généralement approprié**  Vous trouverez ici les traitements les plus recommandés : • Cela peut impliquer un ou plusieurs traitements équivalents pour votre patient. Choisissez librement parmi l'une des options décrites. • Vous pouvez également trouver des conseils complémentaires aux traitements spécifiques à votre patient. Par exemple, cela peut concerner le traitement lié aux partenaires, traitement des symptômes, renvoi à un spécialiste, ... **Barre jaune : Peut être approprié**  Cela signifie que le traitement proposé est adapté dans des circonstances spécifiques : • Il s'agit généralement d'un ou plusieurs traitements de deuxième choix, ou

	• C'est un traitement à envisager dans les conditions où les spécifications complémentaires décrites dans la recommandation sont d'application. Si vous trouvez plusieurs propositions de soins, elles sont toujours équivalentes. **Barre rouge : Pas approprié**  Cela signifie que le traitement n'est pas recommandé pour l'indication et les paramètres donnés sur le patient.
DE	*The translation for this content should be provided by the software provider.*
EN	*The translation for this content should be provided by the software provider.*

10.6. User conclusion

The call-to-action must be clear, direct, and intuitive, guiding the user to select one support option as their final choice. This can be implemented in two ways:

- By placing a dedicated action button within each support option
- Or by making the entire support option area clickable

To enhance usability and ensure the user recognizes the interactive elements, include clear visual cues such as:

- Hover effects (e.g., background color change or shadow effect)
- Cursor changes to indicate interactivity
- Consistent styling aligned with the overall user interface

These design elements help users understand that an action is expected and make the selection process smoother and more accessible.

10.6.1 Green or yellow score

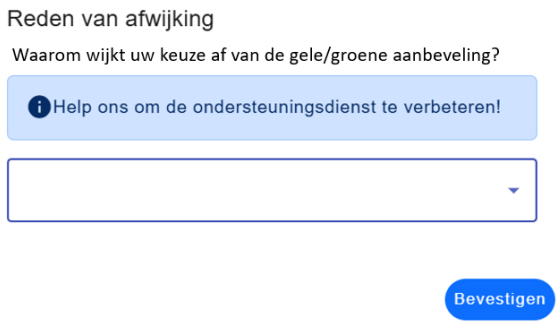
When the user selects a support option with a **green** or **yellow** score, the system should immediately display a **confirmation** message to acknowledge their selection. This provides the user with instant feedback, confirming that their choice is registered and that the selection meets the necessary criteria.

10.6.2 Red score: ask reason of deviation

When the user selects a support option with a red score, a pop-up must appear, prompting the user to provide a reason or motivation for deviation. This step helps ensure that the user's decision to select a less recommended option is intentional and properly documented.

The pop-up should include:

- A dropdown with fixed list of reasons for deviations, and the option to choose an "other reasons" which opens a free text field for the user to specify the reason
- Clear instructions on why this information is necessary



The user must select maximum 1 item from the list of reason of deviations and confirm his selection.

The list of possible reasons has been validated with the business. The list of reasons for deviation are not communicated through FHIR. The following list of 8 reasons for deviation must be implemented:

Language	Concerning clinical signs
NL	Verontrustende kliniek
FR	Clinique inquiétante
DE	*The translation for this content should be provided by the software provider.*
EN	*The translation for this content should be provided by the software provider.*

Language	Comorbidities
NL	Comorbiditeiten
FR	Comorbidités
DE	*The translation for this content should be provided by the software provider.*
EN	*The translation for this content should be provided by the software provider.*

Language	Yields faster results
NL	Geeft sneller resultaat
FR	Donne des résultats plus rapides
DE	*The translation for this content should be provided by the software provider.*
EN	*The translation for this content should be provided by the software provider.*

Language	Positive past experiences
NL	Positieve eerdere ervaringen
FR	Expériences antérieures positives
DE	*The translation for this content should be provided by the software provider.*
EN	*The translation for this content should be provided by the software provider.*

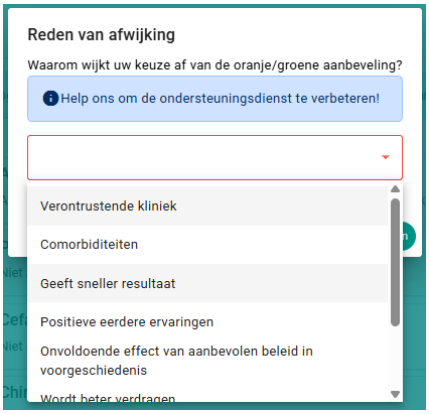
Language	Previously recommended treatment was insufficiently effective
NL	Onvoldoende effect van aanbevolen beleid in voorgeschiedenis
FR	Effet insuffisant de la politique recommandée dans l'histoire

DE	*The translation for this content should be provided by the software provider.*
EN	*The translation for this content should be provided by the software provider.*

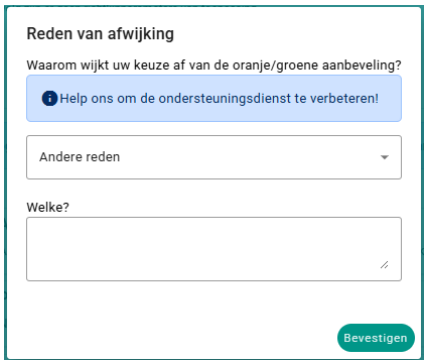
Language	Is better tolerated
NL	Wordt beter verdragen
FR	Mieux toléré
DE	*The translation for this content should be provided by the software provider.*
EN	*The translation for this content should be provided by the software provider.*

Language	Allergy
NL	Allergie
FR	Allergie
DE	*The translation for this content should be provided by the software provider.*
EN	*The translation for this content should be provided by the software provider.*

Language	Other reason
NL	Andere reden
FR	Autre raison
DE	*The translation for this content should be provided by the software provider.*
EN	*The translation for this content should be provided by the software provider.*



When the user selects “Other reason” from the list, then an input field must be provided so that the user can enter free text to provide a reason. It is mandatory to fill in free text when “Other reason” was selected. Once the user has entered their text, a confirmation button should be available to finalize their input. The user should not be able to confirm without inserting a free text for “Other reason”.



Hereby a suggested list of translations for the other labels in the reason for deviation pop-up:

Language	Title “Reason for deviation”
NL	Reden van afwijking
FR	Raison de la déviation
DE	*The translation for this content should be provided by the software provider.*
EN	*The translation for this content should be provided by the software provider.*

Language	Text “why user deviates from yellow/green recommendation”
NL	Waarom wijkt uw keuze af van de gele/groene aanbeveling?
FR	Pourquoi votre choix diffère-t-il de la recommandation jaune/verte?
DE	*The translation for this content should be provided by the software provider.*
EN	*The translation for this content should be provided by the software provider.*

Language	Text “why user deviates from oran”
NL	Help ons om de ondersteuningsdienst te verbeteren!
FR	Aidez-nous à améliorer le service d'assistance!
DE	*The translation for this content should be provided by the software provider.*
EN	*The translation for this content should be provided by the software provider.*

Language	Wich other reason (mandatory field)
NL	Welke?
FR	Laquelle ?
DE	*The translation for this content should be provided by the software provider.*
EN	*The translation for this content should be provided by the software provider.*

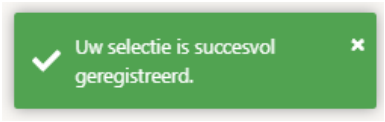
Language	Confirm
NL	Bevestigen
FR	Confirmer
DE	*The translation for this content should be provided by the software provider.*
EN	*The translation for this content should be provided by the software provider.*

When the user confirmed, then a confirmation must be displayed the same way as for the green/yellow treatment options.

10.6.3 Confirmation

Upon successful submission of the user conclusion, a confirmation message should be displayed to the user, clearly stating: “The selection has been registered successfully.”

This message provides immediate feedback to the user, assuring them that their selection has been processed correctly. It should be visually prominent and easy to understand.



Language	Confirmation message user conclusion successfully saved
NL	Uw selectie is succesvol geregistreerd.
FR	Votre sélection a été enregistrée avec succès.
DE	*The translation for this content should be provided by the software provider.*
EN	*The translation for this content should be provided by the software provider.*

11. Radiology: front-end requirements

This chapter outlines the front-end requirements and best practices for implementing 1) the clinical indication input module, and 2) the PSS recommendations viewer, specifically tailored for the radiology domain. The purpose is to help software integrators build a user-friendly and interoperable interface that captures relevant clinical information and triggers accurate recommendations via backend services (QSI & PSS).

Special attention has been given to label wording and vocabulary, based on feedback from professionals in the field, to ensure the interface uses the correct language for radiology use cases. By following this guide, integrators can deliver a reliable and consistent experience that fits seamlessly into broader clinical workflows.

11.1. Disclaimer

When a professional uses PSS Radiology, then a disclaimer should be displayed any time. The development of the disclaimer is the responsibility of the integrators. The disclaimer could be displayed for example at the bottom of the screen. The disclaimer should contain the following content:

Language	Disclaimer content
NL	De aanbevelingen zijn gebaseerd op de ESR iGuide, uitgegeven door de European Society of Radiology (ESR), en kunnen dus enkel gebruikt worden voor dit en gelijkaardige toepassingsgebieden. De aanbevelingen dienen slechts ter ondersteuning bij het voorschrijven van beeldvormende onderzoeken en zijn geen vervanging van de medische expertise van de voorschrijver **en de radioloog**.
FR	Les recommandations sont basées sur l'ESR iGuide, publié par la Société Européenne de Radiologie (ESR), et ne peuvent donc être utilisées que pour ce domaine d'application et des domaines d'application similaires. Les recommandations sont uniquement destinées à aider à la prescription des examens d'imagerie et ne remplacent pas l'expertise médicale du prescripteur **et du radiologue.**
DE	Die Empfehlungen basieren auf dem ESR iGuide, herausgegeben von der Europäischen Gesellschaft für Radiologie (ESR), und können daher nur für diesen und ähnliche Anwendungsbereiche verwendet werden. Die Empfehlungen sollen lediglich als Hilfestellung bei der Verschreibung von bildgebenden Untersuchungen dienen und ersetzen nicht die medizinische Fachkompetenz des verschreibenden Arztes **und des Radiologen**.
EN	The recommendations are based on the ESR iGuide, published by the European Society of Radiology (ESR), and can therefore only be used for this and similar areas of application. The recommendations are only intended to support prescribing imaging studies and are not a substitute for the medical expertise of the prescriber **and the radiologist**.

11.2. Steps to get fine-grained indications

This chapter describes the front-end guidelines for the user interface to capture clinical indications in order to get refined recommendations.

The flow allows users to:

1. Select an **exam** (= *optional*).
2. Provide **indication keywords**.
3. Submit to load indications
4. Receive **fine-grained clinical indications** filtered through QSI.
5. Submit to confirm and trigger recommendation logic via PSS.

The role of the integrator is to ensure adherence to UX/UI guidelines, data structure compatibility, translation handling, when implementing the flow to be in line with the back-end. Each step builds on the previous one and forms a linear process for consistent data flow and valid output.

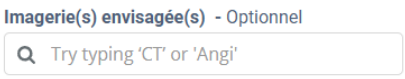
Clearly indicate which fields are optional and which fields are mandatory, using asterixis '*' and label:

Language	Information message about mandatory fields
NL	Verplicht veld
FR	Champ obligatoire
DE	*The translation for this content should be provided by the software provider.*
EN	*The translation for this content should be provided by the software provider.*

1. Exam ID Selection (Optional)

Component:

- Input Field with autocomplete (single selection)
- Make it visually clear that this field is optional



Behavior:

- Only 1 selection allowed for now
- When examId is provided, it filters indications to only those linked to AUC recommendations for the selected exam. The fields should be strategically placed in order to respect the order of the impact they have on each other.

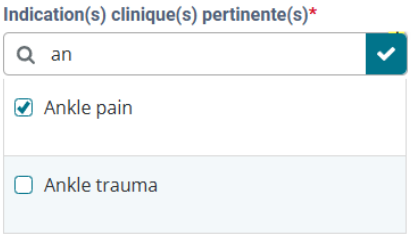
Language	Message to inform about manual adjustment
NL	Geplande beeldvorming (optioneel)
FR	Imagerie envisagée (optionnel)
DE	*The translation for this content should be provided by the software provider.*
EN	*The translation for this content should be provided by the software provider.*
Language	**Placeholder**
NL	Type om te selecteren

FR	Taper pour sélectionner
DE	*The translation for this content should be provided by the software provider.*
EN	*The translation for this content should be provided by the software provider.*

2. Indication Keyword Input (Mandatory)

Component:

- Autocomplete Multiselect Dropdown with checkboxes
- Make it visually clear that this field is mandatory



Behavior:

- Users can scroll entire list alphabetically (label A–Z)

UX:

- Display format: "Indication Label", e.g., *"Vascular dementia"*
- Confirmed selections shown as chips below input
- With option in the chip to remove it

Language	Message to inform about manual adjustment
NL	Relevante klinische indicatie(s)
FR	Indication(s) clinique(s) pertinente(s)
DE	*The translation for this content should be provided by the software provider.*
EN	*The translation for this content should be provided by the software provider.*
Language	**Placeholder**
NL	Type keyword(s)
FR	Veuillez insérer des mot(s)-clé(s)
DE	*The translation for this content should be provided by the software provider.*
EN	*The translation for this content should be provided by the software provider.*

3. **Submit to Load Indications**

Component:

- Submit Button

Behavior:

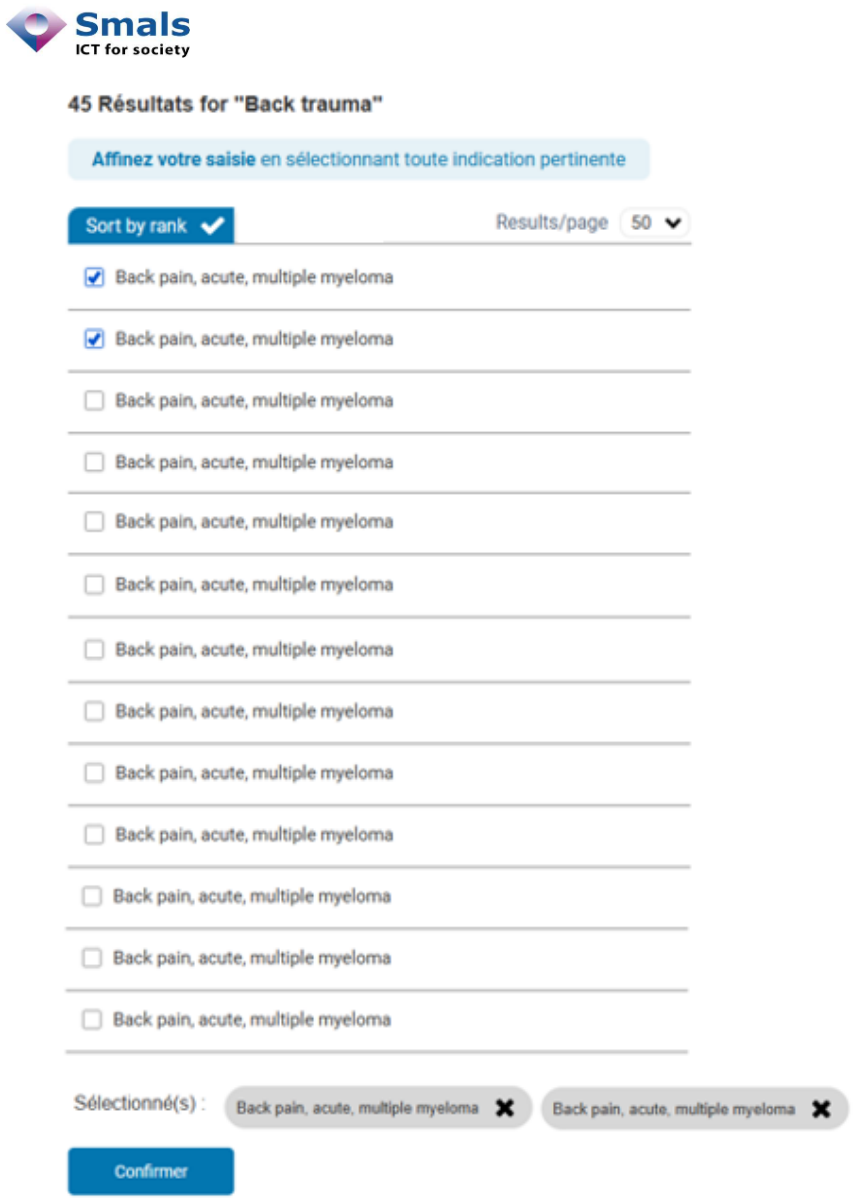
- When the submit button is clicked, age, sex, the examId (if available) and list of indication keywords are send. The back-end returns the list of refined indications after calling QSI.

Language	Label confirm button
NL	Bevestigen
FR	Confirmer
DE	*The translation for this content should be provided by the software provider.*
EN	*The translation for this content should be provided by the software provider.*

4. **Fine-Grained Indication Selection**

Component:

- Table View with multi-select



Behavior:

- Displays up to 50 most relevant results
- Sorted by relevance
- Result format: Indication Label only
- Selected values are submitted as final indications

UX:

- Allow multi-selection
- Chips of selected keywords remain visible under input (after “Sélectionné(s):”)

5. Final Submit (Trigger Recommendation)

Component:

- Submit Button

Behavior:

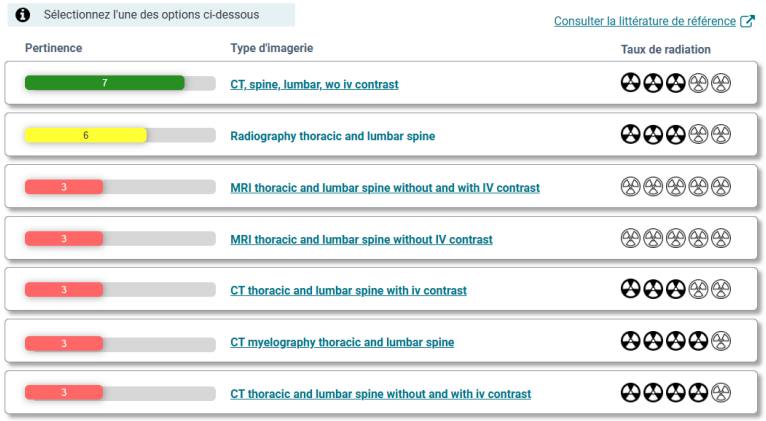
- Sends selected fine-grained indications and examID to the backend

Errors

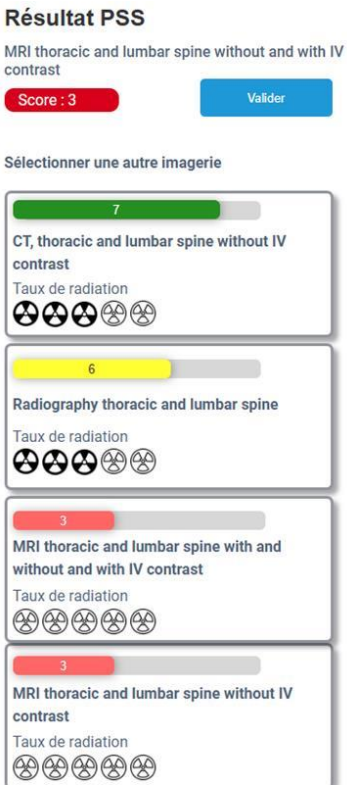
- All errors are returned by QSI and must be clearly displayed in the front-end
- Use standard alert components per your design system
- Errors should map directly to their relevant input field (if applicable)

11.3. Recommendations

The recommendations are displayed after successful submission of the input described in the previous chapter.



If an intended exam was given as an input, then it should be displayed near the recommendations list. The following wireframe is an example of how that could be displayed to the end user:



11.3.1 Support options

The system presents a list of support options as part of the PSS result. There is at least one support option available for display. Each support option includes the following elements:

- **Score**
- **Examination**
- **Radiation**

Language	
NL	Score
FR	Score
DE	*The translation for this content should be provided by the software provider.*
EN	*The translation for this content should be provided by the software provider.*

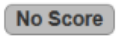
Language	
NL	Type beeldvorming
FR	Type d'imagerie
DE	*The translation for this content should be provided by the software provider.*
EN	*The translation for this content should be provided by the software provider.*

Language	
NL	Stralingsdosis
FR	Taux de radiation
DE	*The translation for this content should be provided by the software provider.*
EN	*The translation for this content should be provided by the software provider.*

Scoring System

In the radiology domain, the support options are scored:

- **Score 9, 8, 7** – Green: Generally recommended
- **Score 6, 5, 4** – Yellow: Less recommended
- **Score 3, 2, 1** – Red: Not recommended
- **No score 10** – Grey : No score



In addition to using color coding, we recommend incorporating an extra visual indicator to ensure accessibility for users with color vision deficiencies. For example, the length of the filled portion of a scoring bar can vary by score, offering a non-color-based visual cue. We advise to display the numeric score inside the scoring bar. A good color contrast must be respected to ensure readability.

Examination

The Examination (e.g., “CT, head, wo iv contrast”) should be displayed in bold to attract attention and enhance the readability of the recommendations.

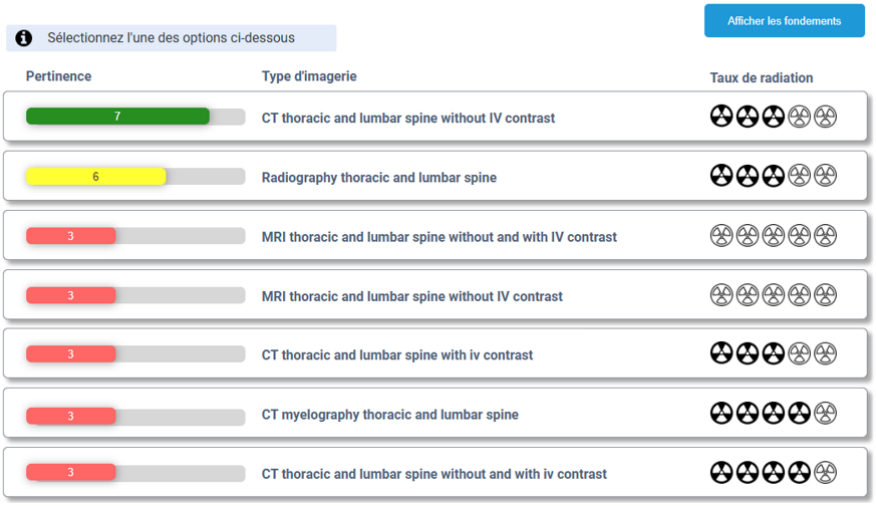
Radiation level

The level of radiation should be displayed, ideally using radiation icons that indicate the degree of radiation.

Interactivity

Each support option must be clickable, enabling the user to register their conclusion or selection directly.

Example: The support table in the example displays seven support options. All the support options are fully clickable. When the user hovers over the first option, then the first support option is highlighted, indicating that it can be selected.



Links to Additional Information

Close to the support table, a link or button is provided to redirect the user to additional resources hosted on external platforms. This link or buttonoffer access to detailed guidelines, clinical background information, and supporting evidence. The link should be opened in a new tabblad.

11.4. User conclusion

The call-to-action must be clear, direct, and intuitive, guiding the user to select one support option as their final choice. This can be implemented in two ways:

- By placing a dedicated action button within each support option
- Or by making the entire support option area clickable

To enhance usability and ensure the user recognizes the interactive elements, include clear visual cues such as:

- Hover effects (e.g., background color change or shadow effect)
- Cursor changes to indicate interactivity
- Consistent styling aligned with the overall user interface

These design elements help users understand that an action is expected and make the selection process smoother and more accessible.

11.4.1 Green score

When the user selects a support option with a **green** score, the system should immediately display a **confirmation** message to acknowledge their selection. This provides the user with instant feedback, confirming that their choice is registered and that the selection meets the necessary criteria.

11.4.2 Yellow or red score: ask reason of deviation

When the user selects a support option with a red score, a pop-up must appear, prompting the user to provide a reason for deviation. This step helps ensure that the user's decision to select a less recommended option is intentional and properly documented.

The pop-up should include:

- A text field or dropdown for the user to specify the reason
- Clear instructions on why this information is necessary

The user must select maximum 1 item from the list of reason of deviations and confirm his selection.

The list of possible reasons has been validated with the business. The list of reasons for deviation are not communicated through FHIR. The following list of 8 reasons for deviation must be implemented:

Language	Pregnancy
NL	Zwangerschap
FR	Grossesse
DE	*The translation for this content should be provided by the software provider.*
EN	*Pregnancy*

Language	My patient has an implant that is incompatible with the suggested exam
NL	Aanwezigheid van implantaten
FR	Présence d'implant
DE	*The translation for this content should be provided by the software provider.*
EN	*The translation for this content should be provided by the software provider.*

Language	My patient has an allergy to contrast agent(s)
NL	Allergie voor contrastmiddel(en)
FR	Allergie au(x) produit(s) de constraste
DE	*The translation for this content should be provided by the software provider.*
EN	*The translation for this content should be provided by the software provider.*

Language	Recommendation does not encompass the full clinical condition of my patient
NL	Aanbeveling is niet compatibel met de volledige klinische toestand van de patiënt
FR	Recommandation incompatible avec l'état clinique complet du patient
DE	*The translation for this content should be provided by the software provider.*
EN	*The translation for this content should be provided by the software provider.*

Language	The waiting time for the suggested recommendation is too long
NL	Aanbeveling gaat gepaard met een te lange wachttijd

FR	Recommandation s'accompagnant d'un temps d'attente trop long
DE	*The translation for this content should be provided by the software provider.*
EN	*The translation for this content should be provided by the software provider.*

Language	This is an emergency situation
NL	Dit is een noodsituatie
FR	C'est une situation d'urgence
DE	*The translation for this content should be provided by the software provider.*
EN	*The translation for this content should be provided by the software provider.*

Language	Other reason
NL	Andere reden
FR	Autre raison
DE	*The translation for this content should be provided by the software provider.*
EN	*The translation for this content should be provided by the software provider.*

When the user selects “Other reason” from the list, then an input field must be provided so that the user can enter free text to provide a reason. Once the user has entered their text, a confirmation button should be available to finalize their input.

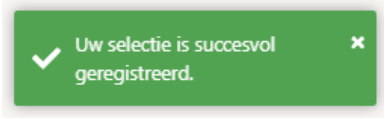
When the user confirmed, then a confirmation is displayed (see below).

Please note, that for the UI guidelines to develop the pop-up for the reason of deviation, you can follow the example of the ‘reason for deviation’ pop-up for antimicrobial. Beware that the reason of deviation for antimicrobial is only mandatory for a support option with a red score, and for radiology it is mandatory for support option with yellow or red score. Therefore, the labels should be adapted.

11.4.3 Confirmation

Upon successful submission of the user conclusion, a confirmation message should be displayed to the user, clearly stating: “The selection has been registered successfully.”

This message provides immediate feedback to the user, assuring them that their selection has been processed correctly. It should be visually prominent and easy to understand.



Language	Confirmation message user conclusion successfully saved
NL	Uw selectie is succesvol geregistreerd.
FR	Votre sélection a été enregistrée avec succès.
DE	*The translation for this content should be provided by the software provider.*
EN	*The translation for this content should be provided by the software provider.*