## Names and Versions

The original [Argonaut Data Query Implementation Guide](http://www.fhir.org/guides/argonaut/r2/), i.e., Argonaut, profiles the Fast Healthcare Interoperability Resources (FHIR) DSTU2 specifications. Today, Argonaut is the [US Core Implementation Guide](http://www.hl7.org/fhir/us/core/) profiling the FHIR STU3 and R4 specifications.

The [original International Patient Summary Implementation Guide](http://international-patient-summary.net/mediawiki/index.php?title=IPS_implementationguide_1), i.e., IPS, profiles the clinical document architecture (CDA) R2 specifications. [IPS](http://hl7.org/fhir/uv/ips/2018May/index.html) today, having been ported to the FHIR world, profiles the FHIR STU3 and R4 specifications.

This paper compares [IPS version 0.1.0](http://www.hl7.org/fhir/uv/ips/2018May/) with [Argonaut 2.0.0](http://hl7.org/fhir/us/core/STU2/) (most recent published versions profiling FHIR STU3), and [IPS version 0.2.0](http://www.hl7.org/fhir/uv/ips/2018Sep/) with [Argonaut 2.1.0](http://hl7.org/fhir/us/core/2019Jan/) (most recent published versions profiling FHIR R4).

## Document vs. API

IPS—coming from the CDA world—defines a FHIR document structure, but does not specify how the resulting documents are exchanged. Argonaut, on the other hand, explicitly defines the actors exchanging the data and specifies how the FHIR REST API is used to query the profiled resources.

REST-based Argonaut supports transferring specific resources—e.g., a client (US core requestor) can only request observation.

IPS requires a single document containing all the information without the possibility to pick and choose for the recipient.

The IPS document format lends itself to asynchronous or off-band transfer: email attachments, (S)FTP, and even thumb drives, whereas the Argonaut API approach requires the recipient to have a direct network connection with the data source.

## Goals

IPS’s goal is specific: “minimal and non-exhaustive patient summary dataset, specialty-agnostic, condition-independent, but readily usable by clinicians for the cross-border unscheduled care of a patient.” Argonaut’s goal is a much broader: “minimum conformance requirements for accessing patient data.”

This difference in goals is reflected in their choice of profiled resources: strictly clinical for IPS and broader for Argonaut (e.g., care plans).

## “Must Support” Elements

Both IPS and Argonaut mark certain elements as “must support,” but their definitions are different:

* IPS’s [broad definition](http://hl7.org/fhir/uv/ips/2018May/general.html#profiling-approach-mustsupport): “flag the items that have to be supported to comply with the minimal data set, unconstraining all the others."
* Argonaut’s [specific definition](http://hl7.org/fhir/us/core/STU2/guidance.html#must-support): "US Core Responders SHALL be capable of including the data element as part of the query..."

This difference in definitions means that an element marked as “must support” in IPS is somewhere between “optional” and “must support” in Argonaut. “Must support” elements are more likely to be missing or unused in IPS than in Argonaut.

## Restrictiveness

In general, IPS is more restrictive than Argonaut: elements that are required in IPS are often only “must support” or outright optional in Argonaut, but this is not always the case; for example, Patient.identifier is optional in IPS but required in Argonaut.

It is more likely that IPS-conformant data also conforms with Argonaut than vice versa—but there are no guarantees that this will be the case.

## Negation

IPS defines a way to specify that the patient does *not* have something:

* No allergy information (unknown); no allergies in general; or no medication, environmental, or food allergies—using codes from the [absent-or-unknown-allergies](http://hl7.org/fhir/uv/ips/2018Sep/ValueSet-absent-or-unknown-allergies-uv-ips.html) value set in Allergy.code.
* Unknown or no known conditions (problems)—using codes from the [absent-or-unknown-problems](http://hl7.org/fhir/uv/ips/2018Sep/ValueSet-absent-or-unknown-problems-uv-ips.html) values set in Condition.code.
* Unknown or no known vaccinations—using codes from the [absent-or-unknown-immunization](http://hl7.org/fhir/uv/ips/2018Sep/ValueSet-absent-or-unknown-immunization-uv-ips.html) value set in Immunization.vaccineCode.
* Unknown or no known medications—using codes from the [absent-or-unknown-medication](http://hl7.org/fhir/uv/ips/2018Sep/ValueSet-absent-or-unknown-medication-uv-ips.html) value set in MedicationStatement.medicationCodeableConcept.
* Unknown or no known procedures—using codes from the [absent-or-unknown-procedure](http://hl7.org/fhir/uv/ips/2018Sep/ValueSet-absent-or-unknown-procedures-uv-ips.html)s value set in Procedure.code.

Argonaut does not spell out how to express negation, but being a REST API, would not generally return any resources in the “unknown” cases. It can use the SNOMED codes for “no known allergy,” “no known problems,” and “no known procedures”; and the CVX code for “no vaccine administered” to express negation for these resources.

## Main Value Sets

In both IPS and Argonaut, allergies and conditions are coded using SNOMED. IPS uses a custom value set to express negation (see above).

In IPS, immunizations (vaccines) and medications are coded according to the [identification of medicinal products](https://www.ema.europa.eu/en/human-regulatory/overview/data-medicines-iso-idmp-standards-overview) (IDMP) standard and the [WHO ATC classification](https://www.whocc.no/atc/structure_and_principles/) (using different coding for the various IDMP sub-standards and the WHO classification), plus a custom value set to express negation (see above). In Argonaut, immunizations are coded using CVX and medications are coded using RxNorm.

In both IPS and Argonaut, observations are coded using LOINC.

In IPS, procedures are coded using SNOMED. In Argonaut, procedures are coded using either SNOMED or CPT. IPS uses a custom value set to express negation (see above).

## Additional Notable Differences

The patient name and identifier are optional in IPS, but required in Argonaut.

MedicationStatement can express the medication as a reference or CodeableConcept in Argonaut, but only as a reference in IPS (unless it is a negation [unknown or no medication] case).

The Reference.identifier element is generally prohibited in IPS, but optional in Argonaut.

## Profiled Data Types

IPS profiles CodeableConcept and coding, explicitly specifying the [translation extension](http://hl7.org/fhir/languages.html) for Coding.display. It is a standard extension, so Argonaut implementations can use it as well.

IPS also profiles narrative, adding an [IPS-specific extension](http://hl7.org/fhir/uv/ips/2018Sep/StructureDefinition-translateddiv-uv-ips.html) specifying translations for the narrative. This profiled narrative is used for Composition.section.text, for which there is no Argonaut correspondent.

IPS profiles quantity, range, and ratio, requiring that a measurement unit is specified and uses [UCUM](http://unitsofmeasure.org/) units. Argonaut uses UCUM as well, but specifies it as an invariant, only for quantity and only if a measurement unit system is specified (i.e., not having a system is valid in Argonaut, but not in IPS).

Argonaut does not explicitly profile any data type, but defines one extension that applies to the ContactPoint data type (see below).

## Extensions

Argonaut defines extensions specifying patients’ [race](http://hl7.org/fhir/us/core/STU2/StructureDefinition-us-core-race.html) and [ethnicity](http://hl7.org/fhir/us/core/STU2/StructureDefinition-us-core-ethnicity.html). As this is very US-centric data, there is no IPS equivalent.

Argonaut defines an extension specifying patients’ [birth sex](http://hl7.org/fhir/us/core/STU2/StructureDefinition-us-core-birthsex.html). There is no IPS equivalent.

Argonaut defines an extension specifying if an email in Patient.telecom, Practitioner.telecom, or Organization.telecom (all ContactPoint) is a direct address. There is no IPS equivalent.

IPS defines an extension specifying [translations](http://hl7.org/fhir/uv/ips/2018Sep/StructureDefinition-translateddiv-uv-ips.html) for a narrative (see above). There is no Argonaut equivalent.

IPS defines an extension specifying the [abatement date](http://hl7.org/fhir/uv/ips/2018Sep/StructureDefinition-abatement-dateTime-uv-ips.html) of an allergy. There is no Argonaut equivalent.

IPS defines an extension specifying the [preferred practitioner or organization](http://hl7.org/fhir/uv/ips/2018Sep/StructureDefinition-participant-uv-ips.html) to be contacted for a patient. It applies to the whole composition—not to the patient resource. There is no Argonaut equivalent.

IPS defines an extension specifying the [details about a statement](http://hl7.org/fhir/uv/ips/2018Sep/StructureDefinition-statement-uv-ips.html) on a resource. There is no Argonaut equivalent.

## Resources Profiled in Argonaut, but Not IPS

CarePlan, CareTeam, Goal, Encounter, Location, PractitionerRole: not strictly clinical data, so out of scope for IPS.

DocumentReference—US Core DocumentReference Profile: not relevant in a summary, especially one that is delivered as a document, so out of scope for IPS.

DocumentReference—[New US Core DocumentReference Profile](http://hl7.org/fhir/us/core/2019Jan/StructureDefinition-new-us-core-documentreference.html) (clinical notes): IPS can use observation to represent clinical notes.

MedicationRequest: IPS uses MedicationStatement, which conveys the same information (medication used by the patient) within a summary.

DiagnosticReport—US Core Diagnostic Report Profile: IPS uses observation with children for the same purpose of grouping lab results.

DiagnosticReport—[New US Core Diagnostic Report Profile for Report and Note exchange](http://hl7.org/fhir/us/core/2019Jan/StructureDefinition-new-us-core-diagnosticreport.html): IPS uses observation and ImagingStudy to represent textual and imaging reports.

## Resources Profiled in IPS, but Not Argonaut

DeviceUseStatement (only for FHIR STU3): IPS makes the distinction between the statement that a device is being used and the device description itself (device resource). Argonaut uses only the device description.

Composition: does not apply to Argonaut because it is API-based.

ImagingStudy: Argonaut represents imaging data using DiagnosticReport in FHIR R4; it does not profile imaging data for FHIR STU3.

Specimen: this data is not profiled in Argonaut.

## IPS Resource Profiles with No Argonaut Correspondent

Device-observer: device used to gather clinical data is not profiled in Argonaut (profiles only implanted devices).

Device (use statement, only for FHIR R4): IPS makes the distinction between the statement that a device is being used and the device description itself. Argonaut uses only the device description.

Observation-attachment: generic attachments like PDF or HTML go in DiagnosticReport.presentedForm in Argonaut.

Observation (media, only for FHIR R4): media attachments go in DiagnosticReport.presentedForm in Argonaut.

Observation-pathology, Observation-member-pathology: expressed using lab observation in Argonaut.

Observation-member, Observation-member-laboratory: equivalent to lab observation in Argonaut (IPS uses a parent observation to group lab results; Argonaut uses DiagnosticReport).

Observation-alcoholUse: alcohol use is not explicitly profiled in Argonaut.

Observation-imaging, Observation-member-imaging: imaging data is represented using DiagnosticReport in Argonaut for FHIR R4; it is not profiled in Argonaut for FHIR STU3.

Observation-pregnancy-edd, Observation-pregnancy-outcome, Observation-pregnancy-status: pregnancy data is not profiled in Argonaut.