

KEY to Expression Syntax

{curly braces}	If datatype , substitute with a value If item , substitute with name, id, or URL
<angle brackets>	Path to an element of given datatype
Orange text	Optional
ellipsis (...)	Indicates a pattern that can be repeated
forward slash (/)	Indicates a choice of items
flag(s)	one or more flags separated by white space
datatype(s)	one or more datatypes separated by 'or'
bold	Default value

Notations and Special Values

code	# <code>{code}</code>		
Coding	{CodeSystem} {version} # <code>{code}</code> " {display} "		
card(inality)	{min}..{max}	{min}..	..{max}
Quantity with units	{decimal} '{UCUM code}' " {display} " {decimal} {Coding} " {display} "		
Comments	// single line comment	/* multi-line comment */	
Flags	MS must support SU summary, Σ ?! modifier	TU trial use N normative D draft	
Triple quote string	"""{string/markdown}"""		
Array indices	{[integer]}	[+] next index	[=] same index
References	Reference({Item1} or {Item2} or {Item3}...) Canonical({name/id/url} {version string})		

Paths

Array element	<array element>[0-based index]
Reference	<Reference>[{Resource or Profile}]
Extension	<Extension>[{extension}]
Sliced array	<array element>[slice-name][reslice-name]
Indented rules	Two spaces before a rule prepends the path of the previous rule to the current path ^<element of StructureDefinition>
Caret paths	<element in Profile> ^<element in corresponding ElementDefinition>

Slicing Rubric

- * <array-path> ^slicing.discriminator.type = {#pattern/#value/#type/#profile/#exists}
- * <array-path> ^slicing.discriminator.path = {FHIRPath string}
- * <array-path> ^slicing.rules = {#open/#closed/#openAtEnd}
- * <array-path> ^slicing.ordered = true/false
- * <array-path> ^slicing.description = {string}

Creating Items

Declaration	Keywords	Applicable Rules
Alias	none	none
CodeSystem	Id, Description, Title	Assignment‡, Local Code, Insert
Extension	Id, Description, Title, Parent	Assignment, Binding, Cardinality, Contains (all types), Flag, Insert, Obeys, Path, Type
Instance	InstanceOf, Description, Title, Usage	Assignment, Insert, Path
Invariant	Description, Severity, XPath, Expression	none
Logical or Resource	Id, Description, Title, Parent	Add Element, Assignment‡, Binding‡, Cardinality‡, Flag‡, Insert, Obeys, Path, Type‡ TU
Mapping	Source, Target, Description, Title	Insert, Mapping
Profile	Parent, Id, Description, Title	Assignment, Binding, Cardinality, Contains (standalone/slicing), Flag, Insert, Obeys, Path, Type
RuleSet	none	all
ValueSet	Id, Description, Title	Assignment‡, Exclude, Include, Insert

† does not apply to inherited elements
‡ applies only to caret paths
§ does not include must support (MS) flag type

Declaration	Data Type	Keyword	Data Type
Alias	expression†	Description	string or markdown
CodeSystem	name	Expression	FHIRPath string
Extension	name	Id	id
Instance	id	InstanceOf	name or id or url
Invariant	id	Parent	name or id or url
Logical	name	Severity	code
Mapping	id	Source	name
Profile	name	Target	uri
Resource	name	Title	string
RuleSet	name	Usage	code
ValueSet	name	XPath	XPath string

† {\$name} = {uri|urn:oid}

Rule Syntax

Add Element	* <element> {card} {flag(s)} {datatype(s)} "{short}" " {definition} " TU
Assignment	* <element> = {value} (exactly)
Binding	* <bindable> from {ValueSet} (required/extendible/preferred/example)
Cardinality	* <element> {card}
Contains (slices/inline extensions)	* <array/Extension> contains {name1} {card} {flag(s)} and {name2} {card} {flag(s)} and {name3} {card} {flag(s)} ...
Contains (standalone extensions)	* <Extension> contains {Extension1} named {name1} {card} {flag(s)} and {Extension2} named {name2} {card} {flag(s)} and {Extension3} named {name3} {card} {flag(s)} ...
Flag	* <element1> and <element2> and ... {flag(s)}
Include/Exclude	* include/exclude {Coding} * include/exclude codes from valueset {ValueSet} * include/exclude codes from system {CodeSystem} where {filter1} and {filter2} and ... Filter syntax: {property} {filter-operator} {value}
Insert	* insert {RuleSet} * insert {RuleSet}({param1}, {param2}, ...) TU * <element> insert {RuleSet}({param1}, {param2}, ...)
Local Code	* # <code>{code}</code> # <code>{child code}</code> "{display string}" " {definition} "
Mapping	* <element> -> "{map string}" " {comment string} " # <code>{mime-type code}</code>
Obeys	* <element> obeys {Invariant1} and {Invariant2} ...
Path	* <element> TU
Type	* <element> only {datatype(s)} or {datatype2} or {datatype3} or ... * <element> only Reference({Resource/Profile1} or {Resource/Profile2} or ...)

More Information



FSH Specification FSH Chat FSH School HL7 Project Page



Notations and Special Values	
code	#confirmed
Coding and CodeableConcept	http://snomed.info/sct#363346000 "Malignant neoplastic disease (disorder)"
	ICD10CM#C004
Quantity (UCUM units)	155.0 '[lb_av]' "pounds"
Cardinality	0..1 1..1 2..* (two-sided) ..1 1.. 2.. (one-sided)
Comments	// end of line or single line
	/* This comment continues over multiple lines */
References	Reference(Patient) Reference(Patient or Practitioner) Canonical(MyPatient)

Paths	
Nested element	stage.assessment
Array element	name[0].given[1]
Choice [x] element	valueQuantity, valueReference
Reference choices	performer[Organization]
Extensions	extension[terminationReason]
	extension[http://hl7.org/fhir/StructureDefinition/location-distance]
Sliced arrays	component[DiastolicPressure]
Resliced arrays	component[RespiratoryScore][OneMinute]
StructureDefinition escape (caret syntax)	^abstract
	component[VariationCode] ^short

Slicing Rubric
* component ^slicing.discriminator.type = #pattern
* component ^slicing.discriminator.path = "code"
* component ^slicing.rules = #open
* component ^slicing.ordered = false
* component ^slicing.description = "Slice on component.code"

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Item	Declaration & Keywords
Alias	Alias: \$UCUM = http://unitsofmeasure.org
	Alias: \$race = urn:oid:2.16.840.1.113883.6.238
	Alias: \$GenderIdentity = http://hl7.org/fhir/StructureDefinition/patient-genderIdentity
Code system	CodeSystem: AJCC_FairUse Title: "AJCC Fair Use" Description: "A small subset of AJCC staging codes used for IG examples."
Extension	Extension: TreatmentTerminationReason Id: treatment-termination-reason Title: "Treatment Termination Reason" Description: "Reason for stopping a treatment."
Instance	Instance: TumorMarkerExample01 InstanceOf: TumorMarker Usage: #example Description: "Epidermal growth factor example."
Invariant	Invariant: us-core-8 Description: "Patient.name.given or Patient.name.family or both SHALL be present" Expression: "family.exists() or given.exists()" Severity: #error XPath: "f:given or f:family"
Logical	Logical: FamilyMember Title: "Family Member" Description: "Member of a family unit."
Mapping	Mapping: USCancerPatientToArgonaut Source: USCancerPatient Target: "http://unknown.org/Argonaut-DQ-DSTU2" Id: argonaut-dq-dstu2 Title: "Argonaut DSTU2"
Profile	Profile: USCancerPatient Parent: USCorePatientProfile Id: mcode-cancer-patient Title: "Cancer Patient" Description: "A patient diagnosed with cancer"
Resource	Resource: EmergencyVehicle Title: "Emergency Vehicle" Description: "A vehicle such as ambulance."
Rule set	RuleSet: CommonRadiologyRules //simple RuleSet: AddPatientName(first, last) //parameterized
Value set	ValueSet: AnatomicalOrientationVS Title: "Anatomical Orientation Value Set" Description: "Values for anatomical orientation."

Rules	
Add Element	* email 0..* SU string "Email address" "Patient's email address(es)." * primaryClinicians 0..* Reference(Organization or Practitioner) "PCP" "Primary care physician(s)" * preferredName[x] 0..1 string or HumanName "Preferred Name" "The person's preferred name"
Assignment	* status = #arrived * code = \$SCT#18165001 "Jaundice (finding)" * onsetDateTime = "2019-04-02" * subject = Reference(EveAnyperson) * valueQuantity = 2.5 'mm' * valueQuantity = 2.5 \$UCUM#mm "millimeters"
Binding	* bodySite from CancerBodyLocationVS (preferred) * valueCodeableConcept from http://loinc.org/vs/LL1971-2 (required) * valueQuantity from LengthUnitsVS (extensible)
Cardinality	* severity 0..0 * subject 1..
Contains (inline)	* extension contains treatmentIntent 0..1 MS and terminationReason 0..* MS
Contains (standalone extension)	* extension contains \$GenderIdentity named genderIdentity 0..1 MS and http://hl7.org/fhir/StructureDefinition/patient-disability named disability 0..1 MS
Contains (slicing)	* component contains GeneStudied 0..* MS and VariationCode 0..* and GenomicDNAChange 0..1
Flag	* deceased[x] MS ?! SU * reasonCode and extension[terminationReason] MS
Include/Exclude	* \$SCT#54102005 "G1 grade (finding)" * exclude \$SCT#12619005 * include codes from valueset claim-exception * include codes from system \$SCT where concept is-a #123037004 "Body Structure"
Insert	* insert CommonRadiologyRules * insert AddPatientName(Jane, Doe)
Local Code	* #NED "No Evidence of Disease" "No physical evidence of disease on exam or imaging tests."
Mapping	* -> "Patient" * identifier.system -> "Patient.identifier.system"
Obeys	* obeys us-core-6 and us-core-9 * name obeys us-core-8
Type	* value[x] only CodeableConcept * effective[x] only dateTime or Period * subject only Reference(CancerPatient) * asserter only Reference(Practitioner or Patient)