FHIR Shorthand 1.0 Quick Reference: Syntax

Key to Expression Syntax

{curly braces}	An item to be substituted
<angle brackets>	An element or path to an element with the given data type
Italics	An optional item or statement
ellipsis (…)	Indicates a pattern that can be repeated
vertical bar (|)	Indicates a choice of items or data types
bold	Default value

Notations and Special Values

code	#{code}	
Coding and CodeableConcept	{CodeSystem name|id|url}*{version string}*#{code} *"{display string}"*	
Cardinality	*min..max* (integer.. integer|*)	
Quantity with units	{decimal or integer} '{UCUM code}'	
Comments	// single line	/* multi-line comment */
Flags	MS (must support) SU (summary, Σ) ?! (modifier)	TU (trial use) N (normative) D (draft)
Binding strengths	**required**|extensible|preferred|example	
Triple quote string	""" string|markdown"""	
References	Reference(Resource name|id|url)	
	Canonical({name|id})	

Paths

Array element	<array element>[0-based index]
Reference	<Reference>[{Resource|Profile name|id|url}]
Extension	<Extension>[{extension name|id|URL}]
Sliced array	<array element>[slice-name]*[reslice-name]*
Caret paths	^<element of StructureDefinition>
	<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}*

Item	Keywords
Alias	Alias: {alias name} = {uri|urn:oid}
Extension	Extension: {name} *Parent: {Extension name|id|url}* *Id: {id}* *Title: {string}* *Description: {string or markdown}*
Instance	Instance: {id} InstanceOf: {Resource|Profile name|id|url} *Usage: **#example**|#definition|#inline* *Title: {string}* *Description: {string or markdown}*
Invariant	Invariant: {id} Severity: #error|#warning Description: {string|markdown} *Expression: {FHIRPath string}* *XPath: {XPath expression string}*
Mapping	Mapping: {id} Source: {Profile name|id} Target: {Target specification uri} *Id: {Target specification id}* *Title: {Target description string}* *Description: {string}*
Profile	Profile: {name} Parent: {Resource|Profile name|id|url} *Id: {id}* *Title: {string}* *Description: {string or markdown}*
RuleSet	RuleSet: {name}
Value Set and Code System	ValueSet: {name} or CodeSystem: {name} *Id: {id}* *Title: {string}* *Description: {string or markdown}*

Code System Rules

Define local code	* {code} *"{display string}" "{definition string}"*

More Information

FSH Specification | FSH Chat | SUSHI Github | Project Page

Rules

Assignment	* <element> = {value} *(exactly)*
Binding	* <bindable> from {ValueSet name|id|url} *({strength})*
Cardinality	* <element> *{min}..{max}*
Contains (inline extensions)	* <Extension> contains {name1} {card1} *{flags1}* *and {name2} {card2} {flags2}* *and {name3} {card3} {flags3}* …
Contains (standalone extensions)	* <Extension> contains {Extension1 name|id|url} named {name1} {card1} *{flags1}* *and {Extension2 name|id|url} named {name2} {card2} {flags2}* *and {Extension3 name|id|url} named {name3} {card3} {flags3}* …
Contains (slicing)	* <array> contains {name1} {card1} *{flags1}* *and {name2} {card2} {flags2}* *and {name3} {card3] {flags3}* …
Flag	* <element1> *and <element2> and <element3>* … {flag1} *{flag2} {flag3}*…
Insert	* insert {RuleSet name}
Mapping	* *<element>* -> "{map string}" *"{comment string}"* *#{mime-type code}*
Obeys	* *<element>* obeys {Invariant1 id} *and {Invariant2 id}* …
Type	* <element> only {datatype1} *or {datatype2} or {datatype3}* …
	* <element> only Reference({ResourceType1 name|id|url} *or {ResourceType2 name|id|url}* *or {ResourceType3 name|id|url}* …)

Value Set Rules

Include single code	* *include* {Coding}
Exclude single code	* exclude {Coding}
Include entire code system	* *include* codes from system {CodeSystem name|id|url}
Include from value set	* *include* codes from valueset {ValueSet name|id|url}
Exclude from value set	* exclude codes from valueset {ValueSet name|id|url}
Filter syntax: {property} {filter-operator} {value}	
Include codes with filtering	* *include* codes from system {CodeSystem name|id|url} where {filter} and {filter} and …
Exclude codes with filtering	* exclude codes from system {CodeSystem name|id|url} where {filter}

FHIR Shorthand 1.0 Quick Reference: Examples

Notations and Special Values

code	#confirmed
Coding and CodeableConcept	http://snomed.info/sct#363346000 "Malignant neoplastic disease (disorder)"
	ICD10CM#C004
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] (Instance only; otherwise use slice name)
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"
```


Item 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: TerminationReason Id: mcode-termination-reason Title: "Termination Reason" Description: "Reason for stopping a treatment."
Instance	Instance: mCODETumorMarkerExample01 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"
Mapping	Mapping: USCorePatientToArgonaut Source: USCorePatient Target: "http://unknown.org/Argonaut-DQ-DSTU2" Id: argonaut-dq-dstu2 Title: "Argonaut DSTU2"
Profile	Profile: CancerPatient Parent: $USCorePatient Id: mcode-cancer-patient Title: "Cancer Patient" Description: "A patient diagnosed with cancer"
Rule set	RuleSet: USCoreTerminologyRuleSet
Value set	ValueSet: AnatomicalOrientationVS Title: "Anatomical Orientation Value Set" Description: "Values for anatomical orientation."

Code System Rule

Local code definition	* #NED "No Evidence of Disease" "No physical evidence of disease on exam or imaging tests."

Rules

Assignment	* status = #arrived * code = SCT#18165001 "Jaundice (finding)" * onsetDateTime = "2019-04-02" * subject = Reference(EveAnyperson) * valueQuantity = 2.5 'mm' * valueQuantity = 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)	* 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
Insert	* insert USCoreTerminologyRuleSet
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)

Value Set Rules

Single code	* SCT#54102005 "G1 grade (finding)"
Exclude single code	* exclude SCT#12619005
All codes in system	* include codes from system HGVS
Filter Rules for SNOMED-CT (assumes code system aliased as 'SCT')	
Subsumption	* include codes from system SCT where concept is-a #123037004 "Body Structure"
Exclude subsumption	* exclude codes from system SCT where concept is-a #128462008 "Secondary malignant neoplastic disease (disorder)"