FHIR Shorthand 1.0 Quick Reference: Syntax

Paths

Nested element	*element.subelement.subelement*
Array element	*array-element*[*index*] ([0] optional)
Choice [x] element	value*DataType*
Reference choices	*reference-element*[*Resource or Profile*]
Extensions	extension[*extension-name or id or url*]
	modifierExtension[*ext-name or id or url*]
Sliced arrays	*slice-path*[*slice-name*]
	slice-path[*slice-name*][*reslice-name*]
StructureDefinition escape caret syntax	^*structure-definition-path*
	element-path ^*element-definition-path*

Notations and Special Values

code	#*code* "*optional-display-text*"
Coding and CodeableConcept	*system*#*code* "*optional-display-text*"
	system|*version*#*code* "*optional-display*"
Cardinality	*min*..*max* (*min* integer, *max* integer or *)
UCUM unit	*number* '*ucum-unit*'
Comments	// *single line* /* *multi-line* */
Flags	MS (must support) TU (trial use) SU (summary, Σ) N (normative) ?! (modifier) D (draft)
Binding strengths	**required**, extensible, preferred, example
Multi-line string	""" *string or markdown with new line* """

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 (optional)
* *array-path* ^slicing.ordered = true, **false** (optional)
* *array-path* ^slicing.description = *string* (optional)

More Information

FSH Spec & Doc | FSH Chat | SUSHI Github | Project Page

Item	Keywords *(bold ↔ required)*
Alias	**Alias:** *alias-name* = *url, uri, or urn:oid* (alias names can begin with $)
Profile and Extension	**Profile:** *name* or **Extension:** *name* **Parent:** *uri* Id: *id* Title: *string* Description: *markdown* Mixins: *ruleSet1, ruleSet2* ...
Instance	**Instance:** *id* **InstanceOf:** *profile or resource reference* **Usage:** #example, #definition, #inline Title: *string* Description: *markdown* Mixins: *ruleSet1, ruleSet2* ...
Value Set and Code System	**ValueSet:** *name* or **CodeSystem:** *name* Id: *id* Title: *string* Description: *markdown*
Invariant	**Invariant:** *id* **Severity:** #error, #warning **Description:** *string* Expression: *FHIRPath string* XPath: *XPath expression string*
RuleSet	**RuleSet:** *id*
Mapping	**Mapping:** *id* **Source:** *profile name* **Target:** *uri* **Id:** *id* (for target specification) Title: *string* (describes target specification) Description: *string*

SUSHI and IG Publisher

File extension	.fsh
Install/update SUSHI	$ npm install -g fsh-sushi
Run SUSHI	$ sushi *input-dir* (use . for current dir) $ sushi *input-dir* -o *output-dir*
Update IG Publisher (in output directory)	$ _updatePublisher (Windows) $ ./_updatePublisher.sh (Mac)
Run IG Publisher (in output directory)	$ _genonce (Windows) $ ./_genonce.sh (Mac)

Rules

Fixed Value	* *path* = *value* * *path* = *value* (exactly) (profiles, extensions only) * *Quantity-path* units = *coding*
Binding	* *path* from *valueset* (*strength*) * *Quantity-path* units from *valueset* (*strength*)
Cardinality	* *path min*..*max* * *path min*.. (constrain lower bound only) * *path* ..*max* (constrain upper bound only)
Data type[x] restriction	* *path* only *type* * *path* only *type1* or *type2* or *type3* ...
Reference restriction	* *path* only Reference(*Resource or Profile*) * *path* only Reference(*Resource1* | *Profile2* | ...)
Flags	* *path flag1 flag2* ... * *path1*, *path2*, *path3*... *flag1 flag2* ...
Extensions, Standalone	* *extension-path* contains *extension-reference1* named *local-name1 card1 flags1* and *extension-reference2* named *local-name2 card2 flags2* ... (*extension-reference* is a name, id, or url)
Extensions, Inline	* *extension-path* contains *local-name1 card1 flags1* and *local-name2 card2 flags2* ...
Slices	* *array-element-path* contains *slice-name1 card1 flags1* and *slice-name2 card2 flags2* ...
Invariants	* obeys *invariant1*, *invariant2*, ... * *path* obeys *invariant1*, *invariant2*, ...
Mapping	* -> *map-string comment-string mime-type* * *path* -> *map-string comment-string mime-type*

Value Set Rules

Include single code	* *system*#*code* "*display*"
Exclude single code	* exclude *system*#*code* "*display*"
Include entire code system	* codes from system *codesystem*
Include from value set	* codes from valueset *valueset*
Exclude from value set	* exclude codes from valueset *valueset*
Filter syntax: *property operator string-code-boolean-regex*	
Filter Operators: (not all apply to every code system) is-a, descendent-of, =, is-not-a, regex, in, not-in, generalizes, exists	
Include codes with filtering	* codes from system *codesystem* where *filter1* and *filter2* and ...
Exclude codes with filtering	* exclude codes from system *codesystem* where *filter*

Code System Rules

Define local code	* *code* "*display text*" "*definition text*"

FHIR Shorthand 1.0 Quick Reference: Examples

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

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 */

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"
```

SUSHI and IG Publisher

FSH file	MyFile.fsh
Install/update SUSHI	$ npm install -g fsh-sushi
Run SUSHI from FSH directory	$ sushi .
Update IG Publisher (from ./build directory)	$ _updatePublisher (Windows) $ ./_updatePublisher.sh (Mac)
Run IG Publisher (from ./build directory)	$ _genonce (Windows) $ ./_genonce.sh (Mac)

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
Profile	Profile: CancerPatient Parent: $USCorePatient Id: mcode-cancer-patient Title: "Cancer Patient" Description: "A patient diagnosed with cancer"
Instance	Instance: mCODETumorMarkerExample01 InstanceOf: TumorMarker Usage: #example Description: "Epidermal growth factor example."
Extension	Extension: TerminationReason Id: mcode-termination-reason Title: "Termination Reason" Description: "Reason for stopping a treatment."
Value set	ValueSet: AnatomicalOrientationVS Title: "Anatomical Orientation Value Set" Description: "Values for anatomical orientation."
Code system	CodeSystem: AJCC_FairUse Title: "AJCC Fair Use" Description: "A small subset of AJCC staging codes used for IG examples."
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"
RuleSet	RuleSet: USCoreTerminologyRuleSet
Mapping	Mapping: USCorePatientToArgonaut Source: USCorePatient Target: "http://unknown.org/Argonaut-DQ-DSTU2" Id: argonaut-dq-dstu2 Title: "Argonaut DSTU2"

Code System Rule

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

Rules

Fixed Value	* status = #arrived * code = SCT#18165001 "Jaundice (finding)" * onsetDateTime = "2019-04-02" * subject = Reference(EveAnyperson) * valueQuantity = 2.5 'mm' * valueQuantity units = UCUM#mm "millimeters"
Binding	* bodySite from CancerBodyLocationVS (preferred) * valueCodeableConcept from http://loinc.org/vs/LL1971-2 (required) * valueQuantity units from LengthUnitsVS (extensible)
Cardinality	* severity 0..0 * subject 1..
Datatype[x] restriction	* value[x] only CodeableConcept * effective[x] only dateTime or Period
Reference restriction	* subject only Reference(CancerPatient) * asserter only Reference(Practitioner | Patient)
Flags	* deceased[x] MS ?! SU * reasonCode, extension[terminationReason] MS
Extension, Standalone	* extension contains $GenderIdentity named genderIdentity 0..1 MS and http://hl7.org/fhir/StructureDefinition/patient-disability named disability 0..1 MS
Extension, Inline	* extension contains treatmentIntent 0..1 MS and terminationReason 0..* MS
Slicing	* component contains GeneStudied 0..* MS and VariationCode 0..* and GenomicDNAChange 0..1
Invariants	* obeys us-core-9 * name obeys us-core-8
Mapping	* -> "Patient" * identifier.system -> "Patient.identifier.system"

Value Set Rules

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