FHIR Shorthand Quick Reference: Syntax

🚫 Planned features not yet implemented in SUSHI

Paths

Nested element	element.subelement.subelement
Array element	array-element[index] ([0] optional)
Choice [x] element	valueDataType
Reference choices	reference-element[Resource or Profile]
Extensions	extension[extension-name or id or url]
Sliced arrays	slice-path[slice-name]
	slice-path[slice-name][reslice-name]
StructureDefinition Escape	^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 int or *)
Comments	// single line /* multi-line */
Flags	MS (must support, S) SU (summary, Σ) ?! (modifier)
Binding strengths	required, extensible, preferred, example
Multi-line string	""" string or markdown with new line """

SUSHI and IG Publisher

File extension	.fsh
Install/update SUSHI	$ npm install -g fsh-sushi
Run SUSHI (in FSH directory)	$ sushi input-folder -o output-folder (default output ./build/input/resources)
Update IG Publisher (in output directory)	$ _updatePublisher (Windows) $ ./_updatePublisher.sh (Mac)
Run IG Publisher (in output directory)	$ _genonce (Windows) $ ./_genonce.sh (Mac)

More Information

FHIR Shorthand Zulip channel (#shorthand)	https://chat.fhir.org/#narrow/stream/215610-shorthand
FHIR Shorthand Documentation and Tutorial	http://build.fhir.org/ig/HL7/fhir-shorthand
FHIR Shorthand Documentation Issue Reports	https://github.com/HL7/fhir-shorthand/issues
SUSHI Code Repository	https://github.com/FHIR/sushi
SUSHI Issue Reports	https://github.com/FHIR/sushi/issues
HL7 Confluence Site	https://confluence.hl7.org/display/FHIRI/FHIR+Shorthand
Conference Calls	See http://hl7.org/concalls for details

Item / Keywords

Item	Keywords
Alias	**Alias:** alias-name = url or oid
Profile	**Profile:** name **Parent:** profile or resource name or url 🚫 **Mixins:** mixin1, mixin2, ... **Id:** id (optional, defaults to name) **Title:** string **Description:** string or markdown
Instance	**Instance:** id **InstanceOf:** profile or resource name or URL
Extension	**Extension:** name **Parent:** extension name or id or url (optional, defaults to FHIR Extension element) **Id:** id (optional, defaults to name) **Title:** string **Description:** string or markdown
Value set	**ValueSet:** name **Id:** id (optional, defaults to name) **Title:** string **Description:** string or markdown
Code system	**CodeSystem:** name **Title:** string **Description:** string or markdown
🚫 Invariant	**Invariant:** key **Id:** id (optional, defaults to name) **Description:** string or markdown **Expression:** FHIRPath string **Severity:** #error | #warning **XPath:** XPath expression string
🚫 Mixin	**Mixin:** name **Parent:** profile or resource name

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Rules

Fixed Value	* path = value
Binding	* path from valueset (binding strength)
Cardinality	* path min..max
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 | Profile3 ...)
Flags	* path flag1 flag2 * path1, path2, path3... flag

Extensions	* extension-path contains
	     extension-reference1 card1 flags1 and
	     extension-reference2 card2 flags2 ...
	 (extension-reference can be id or name or url)

Slices	* array-element-path contains
	     slice-name1 card1 flags1 and
	     slice-name2 card2 flags2 ...

🚫 Invariants	* obeys invariant (applies to entire profile) * path obeys invariant * path1, path2, ... obeys invariant

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-or-regex-value

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

Slicing Rubric

* array-path ^slicing.discriminator.type = #pattern \| #value

* 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)

FHIR Shorthand Quick Reference: Examples

🚫 Planned features not yet implemented in SUSHI

Paths

Nested element	stage.assessment
Array element	name[0].given[1]
Choice [x] element	valueQuantity, valueReference
Reference choices	performer[Organization]
Extensions	extension[EvidenceType]
	extension[http://hl7.org/fhir/StructureDefinition/location-distance]
Sliced arrays	component[DiastolicPressure]
Resliced arrays	component[RespiratoryScore][OneMinute]
StructureDefinition Escape	^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..0 1..1 1..*
Comments	// end of line or single line
	/* This comment continues over multiple lines */

SUSHI and IG Publisher

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

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Conference Calls	See http://hl7.org/concalls for details

Item / Keywords

Item	Keywords
Alias	Alias: LNC = http://loinc.org
	Alias: RACE = urn:oid:2.16.840.1.113883.6.238
	Alias: USCorePatient = http://hl7.org/fhir/us/core/StructureDefinition/us-core-patient
Profile	Profile: CancerPatient Parent: USCorePatient (alias defined above) Id: CancerPatient Title: "Cancer Patient" Description: "A patient diagnosed with cancer"
Instance	Instance: mCODETumorMarkerExample01 InstanceOf: TumorMarker
Extension	Extension: TerminationReason Id: TerminationReason 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"
🚫 Mixin	Mixin: USCoreMetadata Parent: DomainResource

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Rules

Rules	
Fixed Value	* status = #arrived
	* code = SCT#363346000 "Malignant neoplastic disease (disorder)"
	* onsetDateTime = "2019-04-02"
	* subject = Reference(EveAnyperson)
Binding	* bodySite from CancerBodyLocationVS (preferred)
	* valueCodeableConcept from http://loinc.org/vs/LL1971-2 (required)
Cardinality	* severity 0..0
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
Extensions	* 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

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)"

Slicing Rubric

```
* component ^slicing.discriminator.type = #pattern
* component ^slicing.discriminator.path = "code"
* component ^slicing.rules = #open
* component ^slicing.ordered = false
* component ^slicing.description = "Slice pattern for component.code"
```