



FHIR Shorthand v1.0 Quick Reference: Syntax



Paths	
Nested element	<i>element.subelement.subelement</i>
Array element	<i>array-element</i> [<i>index</i>] ([0] optional)
Choice [x] element	value <i>DataType</i>
Reference choices	<i>reference-element</i> [<i>Resource or Profile</i>]
Extensions	extension[<i>extension-name or id or url</i>]
Sliced arrays	<i>slice-path</i> [<i>slice-name</i>]
	<i>slice-path</i> [<i>slice-name</i>][<i>reslice-name</i>]
StructureDefinition	<i>^structure-definition-path</i>
Escape	<i>element-path</i> <i>^element-definition-path</i>

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

SUSHI and IG Publisher	
File extension	.fsh
Install/update SUSHI	\$ npm install -g fsh-sushi
Run SUSHI	\$ sushi <i>input-dir</i> -o <i>output-dir</i>
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
Alias	Alias: <i>alias-name</i> = <i>url or oid</i> (<i>alias-name</i> may begin with \$)
Profile	Profile: <i>name</i> Parent: <i>profile or resource name or url</i> Mixins: <i>ruleSet1, profile1, ruleSet2</i> ... Id: <i>id</i> (optional, defaults to name) Title: <i>string</i> Description: <i>string or markdown</i>
Instance	Instance: <i>id</i> InstanceOf: <i>profile or resource reference</i> Usage: example, definition, inline Description: <i>string or markdown</i>
Extension	Extension: <i>name</i> Parent: <i>extension name or id or url</i> (optional) Id: <i>id</i> (optional, defaults to name) Title: <i>string</i> Description: <i>string or markdown</i>
Value set	ValueSet: <i>name</i> Id: <i>id</i> (optional, defaults to name) Title: <i>string</i> Description: <i>string or markdown</i>
Code system	CodeSystem: <i>name</i> Title: <i>string</i> Description: <i>string or markdown</i>
Invariant	Invariant: <i>key</i> Description: <i>string or markdown</i> Expression: <i>FHIRPath string</i> Severity: #error #warning XPath: <i>XPath expression string</i>
RuleSet	RuleSet: <i>name</i>

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Rules	
Fixed Value	* <i>path</i> = <i>value</i>
Binding	* <i>path</i> from <i>valueset</i> (<i>binding strength</i>)
Cardinality	* <i>path</i> <i>min..max</i> * <i>path</i> <i>min..</i> (constrain lower bound) * <i>path</i> <i>..max</i> (constrain upper bound)
Data type[x] restriction	* <i>path</i> only <i>type</i> * <i>path</i> only <i>type1</i> or <i>type2</i> or <i>type3</i> ...
Reference restriction	* <i>path</i> only Reference(<i>Resource or Profile</i>) * <i>path</i> only Reference(<i>Resource1</i> <i>Profile2</i> ...)
Flags	* <i>path</i> <i>flag1</i> <i>flag2</i> * <i>path1, path2, path3... flag</i>
Extensions, Standalone	* <i>extension-path</i> contains <i>extension-reference1</i> named <i>local-name1</i> <i>card1</i> <i>flags1</i> and <i>extension-reference2</i> named <i>local-name2</i> <i>card2</i> <i>flags2</i> ... (<i>extension-reference</i> is name, id, or url)
Extensions, Inline	* <i>extension-path</i> contains <i>local-name1</i> <i>card1</i> <i>flags1</i> and <i>local-name2</i> <i>card2</i> <i>flags2</i> ...
Slices	* <i>array-element-path</i> contains <i>slice-name1</i> <i>card1</i> <i>flags1</i> and <i>slice-name2</i> <i>card2</i> <i>flags2</i> ...
Invariants	* obeys <i>invariant1, invariant2, ...</i> * <i>path</i> obeys <i>invariant1, invariant2, ...</i>

Value Set Rules	
Include single code	* <i>system#code</i> "display"
Exclude single code	* exclude <i>system#code</i> "display"
Include entire code system	* codes from system <i>codesystem</i>
Include from value set	* codes from valueset <i>valueset</i>
Exclude from value set	* exclude codes from valueset <i>valueset</i>
Filter syntax: <i>property operator string-code-boolean-regex</i>	
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 <i>codesystem</i> where <i>filter1</i> and <i>filter2</i> and ...
Exclude codes with filtering	* exclude codes from system <i>codesystem</i> where <i>filter</i>

Slicing Rubric	
* <i>array-path</i> ^slicing.discriminator.type = #pattern, #value	
* <i>array-path</i> ^slicing.discriminator.path = <i>FHIRPath string</i>	
* <i>array-path</i> ^slicing.rules = #open, #closed, #openAtEnd (optional)	
* <i>array-path</i> ^slicing.ordered = true, false (optional)	
* <i>array-path</i> ^slicing.description = <i>string</i> (optional)	



FHIR Shorthand v1.0 Quick Reference: Examples

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

Notations and Special Values	
code	<code>#confirmed</code>
Coding and CodeableConcept	<code>http://snomed.info/sct#363346000 "Malignant neoplastic disease (disorder)"</code>
	<code>ICD10CM#C004</code>
Cardinality	<code>0..1 1..1 2..* (two-sided)</code> <code>..1 1.. 2.. (one-sided)</code>
Comments	<code>// end of line or single line</code>
	<code>/* This comment continues over multiple lines */</code>

SUSHI and IG Publisher	
FSH file	<code>MyFile.fsh</code>
Install/update SUSHI	<code>\$ npm install -g fsh-sushi</code>
Run SUSHI from FSH directory output by default to ./build	<code>\$ sushi .</code>
Update IG Publisher (from ./build directory)	<code>\$ _updatePublisher (Windows)</code>
	<code>\$./_updatePublisher.sh (Mac)</code>
Run IG Publisher (from ./build directory)	<code>\$ _genonce (Windows)</code>
	<code>\$./_genonce.sh (Mac)</code>

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Item	Keywords
Alias	Alias: LNC = <code>http://loinc.org</code>
	Alias: \$race = <code>urn:oid:2.16.840.1.113883.6.238</code>
	Alias: USCorePatient = <code>http://hl7.org/fhir/us/core/StructureDefinition/us-core-patient</code>
Profile	Profile: CancerPatient Parent: USCorePatient (using alias defined above) Id: CancerPatient 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: 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: USCoreTerminologyRuleSet

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"	

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 <code>http://loinc.org/vs/LL1971-2</code> (required)
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 <code>http://hl7.org/fhir/StructureDefinition/patient-disability</code> named disability 0..1 MS and <code>http://hl7.org/fhir/StructureDefinition/patient-genderidentity</code> named genderidentity 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

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)"