

An Application Programming Interface for NDF-RT

Lee Peters, M.S., Thang Nguyen, M.S. and Olivier Bodenreider, M.D., PhD
 U.S. National Library of Medicine, National Institutes of Health, Bethesda, Maryland, USA
 Contact information: RXNAVINFO@LIST.NIH.GOV

The National Drug File Reference Terminology¹ (NDF-RT) is a resource developed by the Department of Veterans Affairs (VA) Veterans Health Administration, as an extension of the VA National Drug File. NDF-RT provides a formal content model that describes and defines medications by naming relevant concepts via preferred and synonymous terms, and describing them via named relations to other terminology concepts, either within NDF-RT or in external terminologies. In other words, NDF-RT is not only terminology, but a source of clinical information, including therapeutic intent (*atorvastatin* may_treat *Hypercholesterolemia*), mechanism of action (*atorvastatin* has_MoA *Hydroxymethylglutaryl-CoA Reductase Inhibitors*), physiologic effect (*atorvastatin* has_PE *Decreased Cholesterol Synthesis*) and drug-drug interactions (e.g., critical interaction between *atorvastatin* and *ketokonazole*).

The NDF-RT API² is developed at the National Library of Medicine as part of the RxNav³ system, which provides access to other drug information sources, including RxNorm and RxTerms. It was released in February 2011. It provides programmatic access to the information in NDF-RT. The API serves the latest version available of NDF-RT. The major functions of the API enable users to find an NDF-RT entity by name or by identifier and to traverse the rich network of relations in NDF-RT, both within and across hierarchies, using the names of the relations. Clinically-oriented functions associate drugs with their pharmacologic classes and can list all interacting drugs for a given drug or test interaction for a given pair of drugs. Although distinct, the RxNorm and NDF-RT APIs are integrated with each other, making it easy for users to query the RxNorm API with NDF-RT identifiers and vice versa. From a technical perspective, the NDF-RT API comes in two flavors: SOAP-based² and RESTful web services⁴. Table 1 shows the related functions in the RESTful API and the SOAP-based API.

¹ <http://evs.nci.nih.gov/ftp1/NDF-RT/NDF-RT%20Documentation.pdf>

² <http://rxnav.nlm.nih.gov/NdfrtAPI.html>

³ <http://rxnav.nlm.nih.gov/>

⁴ <http://rxnav.nlm.nih.gov/NdfrtRestAPI.html>

RESTful resource	SOAP-based function	Type
/	(none)	
/conceptName={conceptName}&kindName={kindName}	findConceptsByName	Find entities
/idType={idType}&idString={idString}	findConceptsByID	
/propertyName={propertyName}&propertyValue={propertyValue}	getConceptsByProperty	
/properties/nui={nui}&propertyName={propertyName}	getConceptProperties	Properties
/childConcepts/nui={nui}&transitive={transitive}	getChildConcepts	Nav. within hierarchies
/parentConcepts/nui={nui}&transitive={transitive}	getParentConcepts	
/associations/nui={nui}&associationName={associationName}	getRelatedConceptsByAssociation	Nav. across hierarchies
/nui={nui}&roleName={roleName}&transitive={transitive}	getRelatedConceptsByRole	
/reverse/nui={nui}&roleName={roleName}&transitive={transitive}	getRelatedConceptsByReverseRole	
/interaction/nui={nui}&scope={scope}	findDrugInteractions	Clinically-oriented
/interaction/nui1={nui1}&nui2={nui2}&scope={scope}	interactions	
/VA/{nui}	getVaClassOfConcept	
/allInfo/{nui}	getAllInfo	Convenience
/associationList	getAssociationList	Housekeeping
/typeList	getIdTypeList	
/kindList	getKindList	
/propertyList	getPropertyList	
/roleList	getRoleList	
/version	getNDFRTversion	

Table 1— RESTful resources and corresponding SOAP-based functions for accessing NDF-RT API