



Sonora Quest
Laboratories™

A Subsidiary of Laboratory Sciences of Arizona

FHIR API Reference Guide

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FHIR API Reference Guide

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About This Guide

The Sonora Quest Laboratories (Sonora Quest) FHIR API Reference Guide is an overview of Sonora Quest's implementation of the HL7[®] Fast Healthcare Interoperability Resources (FHIR[®]) specification, which is a standard for the electronic exchange of healthcare information. The guide outlines the details around how to interact with the FHIR Application Programming Interface (API) to retrieve healthcare information from Sonora Quest's systems.

Intended Audience

This reference guide is intended for third-party developers who are designing software applications to access patient healthcare information within Sonora Quest's systems.

Terms of Use

These General Terms and Conditions, "Agreement" is a legal agreement between "you" (a "Customer, "Developer", or "User") and **Sonora Quest Laboratories, LLC** ("SQL"). "You must accept the Terms of Use ("Agreement") in order to use Sonora Quest's FHIR public Application Programming Interface ("API" or "API System"). This Agreement describes your rights and your obligations required to use the API System. By accepting this Agreement or by accessing or using the API System, you agree to be bound by this Agreement. There shall be no force or effect to any terms of any related proposals, purchase orders or other documents.

1. License; Customer Responsibilities:

1.1 License:

Subject to the terms and conditions of this Agreement, SQL grants Customer a nonexclusive, non-transferable, revocable license for Customer to access and use the API System solely for the internal business purposes of Customer. Any extension of this license grant to acquired businesses or assets of Customer shall be on terms and conditions (including pricing) mutually agreed upon by the parties.

1.2 Customer Requirements:

Customer shall provide, at its own expense, the facilities, computers and devices, network, and other equipment required for use of the API System. Customer must, also obtain any consents, authorizations, and approvals necessary to enable SQL to access such facilities, network, and equipment to perform its obligations for Customer under this Agreement. Moreover, Customer is responsible for obtaining, and keeping updated, any third-party materials that may be required to operate and/or use the features and functionality of the API System, including but not limited to Data (as further defined below) and database access.

1.3 Customer Restrictions:

Customer agrees to not: (i) rent, lease, sublicense, time-share, or otherwise distribute the API System for resale, or to host applications to provide service bureau, time-sharing, or other services to third parties other than any entity or User that is part of Customer, or otherwise make available the API System to any third parties other than any entity or User that is part of Customer, (ii) reverse-engineer, decompile, disassemble, modify, create derivative works of, or copy all or any part of the API System, (iii) permit any User or other person to access or use the API System using another User's ID, login or password or otherwise make an User's ID, login or password available to any third party; (iv) bypass any privacy and/or security measures SQL may use to prevent or restrict access to the API System (or other accounts, computer systems or networks connected to the API System), (v) remove any intellectual property, confidentiality or proprietary notices of SQL and/or any third party which appear in any form on the API System or otherwise in any SQL collateral or materials however reproduced, and (vi) allow the API System and all parts thereof to be subject to unauthorized copying, modification, or disclosure by its Users and other third parties.

1.4 Term:

This Agreement will go into effect on the date upon which the Customer's agrees to them, by accessing or using the API System, and will continue until terminated as set forth herein. Customer may terminate this Agreement by discontinuing use of the API System. Upon termination of this Agreement all rights and licenses granted to Customer will terminate immediately and Customer agrees to promptly destroy documentation and any other API information in its possession or control that was received under this Agreement.

I. Legal and Compliance:

2. Applicable Law:

Each party agrees that, in performance of its respective obligations under this Agreement, it shall comply with all Applicable Laws. As used in this Agreement, "**Applicable Laws**" shall mean any statute, law, ordinance, regulation, requirement, order or rule of the federal government or any federal governmental agency or regulatory body, or any federal governmental or administrative interpretation of any laws, rules or regulations all to the extent applicable to Data or the Services, including, but not limited to, the federal Physician Self-Referral Law, 42 U.S.C. 1395nn, and the regulations promulgated thereunder (together, the "**Stark Law**"), 42 C.F.R. Part 2, together with the Stark Law, the federal Medicare/Medicaid Anti-kickback Law and regulations promulgated thereunder (the "**Federal Anti-kickback Law**") and similar state Anti-kickback laws and regulations (together with the Federal Anti-kickback Law, the "**Anti-kickback Laws**") and the Health Insurance Portability and Accountability Act ("**HIPAA**").

3. Confidentiality:

3.1 Definition:

"**Confidential Information**" means, with respect to each party, any business or technical information of or about such party (including, but not limited to a party's respective product plans, designs, costs, product prices and names, customers, finances, marketing plans, software and documentation, business opportunities, personnel, research, or development) that is (i) disclosed in writing and is designated by the disclosing party as "**confidential**" or "**proprietary**" at the time of disclosure or, (ii) orally disclosed, and designated as confidential at the time of the disclosure and is summarized in writing and delivered to the receiving party by the disclosing party within 30 days after such disclosure. Confidential Information also includes the terms of this Agreement. The Confidential Information of SQL shall include the API System and Data, which includes protected health information ("**PHI**") as defined by HIPAA.

3.2 Exclusions:

Confidential Information does not include information that: (i) is or becomes generally known to the public through no fault or breach of this Agreement by the receiving party; (ii) is already known by the receiving party at the time of disclosure without restrictions on the disclosure of such information; (iii) is independently developed by the receiving party without use of the disclosing party's Confidential Information; (iv) the receiving party rightfully obtains from a third party without restriction on use or disclosure; or (v) is disclosed with the prior written approval of the disclosing party. The receiving party shall bear the burden of showing that any of the foregoing exclusions applies to any information or materials. A breach of these obligations of confidentiality may cause irreparable harm and injury to the non-breaching party. Accordingly, in the event of a material breach or threatened breach, the non-breaching party shall be entitled to seek preliminary and final injunctive relief and any other equitable remedies it may have. Such remedies shall be in addition to, and not in limitation of, any and all other remedies, which such party, may have at law.

3.3 Use and Disclosure Restriction:

Neither party shall use or disclose the other party's Confidential Information except as expressly required or permitted herein. Neither party shall disclose any of such Confidential Information to any of such party's employees, subcontractors, and licensors except as is reasonably required in connection with the exercise of such party's rights and obligations under this Agreement, provided that such employees, subcontractors, and licensors are subject to binding use and disclosure restrictions at least as protective as those set forth herein, executed in writing by such employees, subcontractors, or licensors. However, each party may disclose Confidential Information of the other party: (i) pursuant to the order or requirement of a court, administrative agency, or other governmental body, provided that the disclosing party gives reasonable notice to the other party to contest such order or requirement; and (ii) on a confidential basis to its legal or financial advisors.

4. Data Privacy and Compliance:

4.1 PHI Compliance:

Customer represents and warrants that, to the extent Customer is a "covered entity": (i) any PHI or clinical laboratory data of SQL and Customer's patients which is delivered via the API System (collectively with PHI, the "Data") it requires or receives under this Agreement is solely for its health care operation ("HCO") purposes; (ii) it will not use such information other than for its internal HCO purposes; (iii) it is requesting the minimum necessary PHI to accomplish the intended authorized purpose; (iv) it will not disclose PHI to any third party except in accordance with this Agreement. PHI may be shared with federal or state regulatory agencies, with accreditation agencies, or with the advance written consent of the patient or of SQL; and (v) it will report to SQL promptly the discovery of any type of discrepancies, anomalies, or errors detected in the PHI it receives from SQL.

4.2 Rights; Restrictions:

Customer shall not disclose or utilize the Data in any way that violates any patient confidentiality obligations or any Applicable Laws (as defined below). Customer agrees that all Data, including any derivatives resulting from the manipulation or compilation thereof, are Confidential Information of SQL and that nothing herein grants any rights thereto to Customer. Customer agrees it shall not disclose or utilize Data in any way that violates patient or physician confidentiality obligations or any Applicable Laws. Customer will not disclose, publish, lend, sell, lease or otherwise transfer access or possession of the Data, API System or this Agreement (or any copy of the any portion of the Data, API or this Agreement), except to authorized Users, without SQL's written approval. Customer shall not manipulate, aggregate, integrate, compile, merge, reorganize, regenerate, transfer or otherwise use or disclose the Data for any purpose except for healthcare operations. Customer shall not make any alteration to the content of the Data, and Customer shall always display the Data in a mutually agreed upon format with attribution to SQL. Customer shall not engage in the marketing, sale, or other commercialization, whether direct or indirect, of the Data (whether in identified or de-identified format). Customer may provide a patient's Data to its patient. If the Customer provides the Data to other third parties, it shall have provisions in its agreements with such parties that are at least as restrictive as the terms and conditions that apply to Customer pursuant to this Agreement. Without limiting the foregoing, Customer shall not enter into any agreement with a third party that enables the third party to commercialize the Data or use the Data for marketing purposes, and Customer shall include provisions in its agreements with third parties preventing the commercialization or marketing of Data by such third parties.

4.3 Notice of Disclosure Event:

Customer shall notify SQL immediately, but in no event more than 10 days after Customer learns that here has been any use or disclosure of Data that violates the terms of this Agreement. Customer shall reasonably cooperate with SQL in investigating and terminating uses of the Data that violate the terms of this Agreement.

5. Non-solicitation:

Each party recognizes the expense and time associated with recruiting, hiring, training, and maintaining employees. Each party agrees that, except as consented to by the other party in advance and in writing, it will not during the term of this Agreement or a period of one (1) year thereafter directly or indirectly, solicit to reduce the relationship of the other party's employees to the other party or hire for itself or on behalf of any third party, any of the other party's current employees or who were an employee of the other party within the prior 12 months. Solicitations via any media of general availability, such as newspapers or trade publication advertisements, internet listing or similar solicitations not targeted at specific employees, and to which individuals choose to respond, will not constitute a violation of this Section. Each party agrees that the damages to be incurred by the other party for a violation of this section are difficult to estimate; and accordingly, for any violation of this section by a party or its personnel damages may include costs to recruit and replace such solicited employee.

6. Insurance:

During the term of this Agreement, each party agrees to secure and maintain in force, liability insurance with coverages of reasonably appropriate types and amounts. Each party agrees to produce upon request of the other party certificates of insurance evidencing such coverage.

7. Indemnification:

Customer agrees to defend, hold harmless and indemnify SQL, and its subsidiaries, affiliates, officers, agents, employees, and suppliers, from and against any third party claim arising from or in any way related to Customer's or Customer's users' use of the API System, or any violation of this Agreement, including any liability or expense arising from all claims, losses, damages (actual and consequential), suits, judgments, litigation costs and attorneys' fees, of every kind and nature. In such a case, SQL will provide Customer with written notice of such claim, suit, or action.

II. Miscellaneous:

8. Security:

Customer shall ensure that the systems it uses to provide the Services are secure with appropriate physical, administrative and technical safeguards to protect the confidentiality, integrity, and availability of the Data and to ensure compliance with all Applicable Laws. The parties shall cooperate with any required audit of security measures, including of hardware and software components of each party, as may be required for purposes of Applicable Laws, including as may be required by the Department of Health and Human Services (DHHS) security rules.

9. Rights to Data; Ownership of Rights:

Title to all intellectual property rights, including but not limited to patent, trademark, copyright, design, and trade secrets right in (and title to all copies of and all media bearing) the current and any future version or release of the API System, including, but not limited to features requested and or designed mutually with Customer, and the program concepts contained in the API System is retained by SQL or its applicable third party licensors. For the avoidance of doubt and without limitation, and other than the license granted hereunder, there is no transfer of title or of any proprietary rights or of any intellectual property rights to Customer under this Agreement. Unless specifically stated, in writing, by SQL to the contrary, Customer has no right to use SQL's name, trademarks, or any goodwill now or hereafter associated therewith, all of which is the sole property of and will inure exclusively to the benefit of SQL. Customer will not knowingly use the API System in a manner that violates any third-party intellectual property, contractual or other proprietary rights.

10. Limited Warranty; Disclaimer:

10.1 Mutual Representations and Warranties:

Each party represents and warrants to the other party that: (i) it is duly organized, validly existing, and in good standing as a corporation or other entity under the jurisdiction of its incorporation or other organization; (ii) it has the full right, power, and authority to enter into, and to perform its obligations and grant the rights and licenses it grants or is required to grant under, this Agreement; and (iii) the execution of this Agreement by its representative whose signature is set forth at the end of this Agreement has been duly authorized by all necessary corporate or organizational action of such party which therefore constitutes a legal, valid, and binding obligation of such party, enforceable against such party in accordance with its terms.

10.2 Additional Customer Warranties:

Customer acknowledges that the API System is a data transport tool and is not intended to serve as a medical record, and that it is Customer's sole responsibility to establish policies and procedures that ensure that the content of any Data accessed through the API System is incorporated into a patient's medical record, when applicable. Customer further agrees that it is its sole responsibility to provide or obtain any and all necessary consents and to fulfill any and all obligations that are required by HIPAA, HITECH, or other governmental statute or regulation prior to use, disclosure, or transmission of any Protected Health Information or other data accessed through the API System. Customer agrees that SQL has no obligation to archive or otherwise store any PHI or other data transferred through the API System. Customer acknowledges that SQL does not control the content of Data accessed through the API System, that Data accessed through the API System may contain software viruses or other malicious content, that it is Customer's sole responsibility to protect its computer systems from viruses, and that SQL has no responsibility to protect its computer system from viruses or other malware.

10.3 Warranty Disclaimer; Limitations:

EXCEPT FOR THE EXPRESS WARRANTIES SET FORTH IN THIS SECTION 10, THE API SYSTEM, DATA, AND WORK PRODUCT ARE PROVIDED "AS IS" AND SQL HEREBY DISCLAIMS ALL WARRANTIES, WHETHER EXPRESS, IMPLIED, STATUTORY, OR OTHERWISE, AND SQL SPECIFICALLY DISCLAIMS ALL IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, TITLE, AND NON-INFRINGEMENT, AND ALL WARRANTIES ARISING FROM COURSE OF DEALING, USAGE, OR TRADE PRACTICE. WITHOUT LIMITING THE FOREGOING, SQL MAKES NO WARRANTY OF ANY KIND THAT THE API SYSTEM OR WORK PRODUCT, OR ANY PRODUCTS OR RESULTS OF THE USE THEREOF, WILL MEET CUSTOMER'S OR ANY OTHER PERSON'S REQUIREMENTS, OPERATE WITHOUT INTERRUPTION, ACHIEVE ANY INTENDED RESULT, BE COMPATIBLE OR WORK WITH ANY SOFTWARE, SYSTEM, OR OTHER SERVICES, OR BE SECURE, ACCURATE, COMPLETE, FREE OF HARMFUL CODE, OR ERROR-FREE. THE DISCLAIMERS OF WARRANTY, LIMITATIONS OF LIABILITY, AND OTHER PROVISIONS STATED HEREIN FORM AN ESSENTIAL BASIS OF THE BARGAIN BETWEEN THE PARTIES AND APPLY REGARDLESS OF WHETHER ANY LIMITED REMEDY FAILS OF ITS ESSENTIAL PURPOSE.

11. Governing Law and Costs of Litigation:

This Agreement will be governed by the internal substantive laws of the state of Arizona, without regard to conflict of laws rules or principles. If either party takes legal action to enforce this Agreement, the prevailing party will be entitled to recovery of its reasonable attorneys' fees and costs incurred in connection with such action.

12. No Third-Party Beneficiaries:

Except as specifically provided herein, this Agreement shall not create any additional rights or obligations between or among the parties hereto. Further, this Agreement is not intended to benefit any other parties and shall not create any rights or remedies for any other parties (including, without limitation, the Users).

13. Retention and Inspection of Records:

All records related to this arrangement will be kept on file by Customer for a period of four years from the date the record is made or such longer period of time as may be required by applicable law. Upon reasonable prior notice, Customer will give SQL, or its authorized representative, and any relevant regulatory agency the ability to inspect, examine, and audit, during normal business hours, such of Customer's business records as are relevant to this Agreement. The cost of any SQL inspection, examination, and audit will be at the sole expense of SQL.

14. No Federal Exclusion:

Each party represents and warrants to the other that neither it nor any of its employees, directors, officers, equity owners, subcontractors or agents under this Agreement (each, a "Party Representative") is or at any time has been, excluded or precluded from participation, or are otherwise ineligible to participate, in any federally funded health care program (as defined in 42 USC §1320a-7b(f)) or in any other government payment program, and that no such action is pending ("Excluded Party"). If either party becomes an Excluded Party, that party shall immediately notify the other party of any proposed or actual sanction or exclusion from any federally funded health care program. Such notice shall contain reasonably sufficient information to allow the non-excluded party to determine the nature of any sanction. In the event that a Party Representative is excluded from participation in any federally funded health care program during the term of this Agreement, or if, at any time after the Effective Date, it is determined that a Party is in breach of this Section, the other party may terminate this Agreement, which termination shall be effective immediately, whether or not notice is given.

15. Entire Agreement:

This Agreement, including all Exhibits and Attachments hereto, constitutes the complete understanding of the parties regarding the subject matter hereof. All prior negotiations between the parties are merged in this Agreement, and there are no understandings or agreements other than those incorporated herein. It may not be amended or modified except by a writing signed by authorized representatives of the parties.

16. Assignment:

Neither party may assign or otherwise transfer this Agreement without the other party's prior written consent. If consent to an assignment is obtained, this Agreement is binding on the assigns of the parties to this Agreement.

17. Limitation of Liability:

IN NO EVENT WILL SQL OR ANY OF ITS LICENSORS, VENDORS, SERVICE PROVIDERS, OR SUPPLIERS BE LIABLE TO CUSTOMER UNDER OR IN CONNECTION WITH THIS AGREEMENT OR ITS SUBJECT MATTER UNDER ANY LEGAL OR EQUITABLE THEORY, INCLUDING BREACH OF CONTRACT, TORT (INCLUDING NEGLIGENCE), STRICT LIABILITY, AND OTHERWISE, FOR ANY: (i) LOSS OF PRODUCTION, USE, BUSINESS, REVENUE, OR PROFIT, OR LOSS OF DATA OR DIMINUTION IN VALUE, OR (ii) CONSEQUENTIAL, INCIDENTAL, INDIRECT, EXEMPLARY, SPECIAL, ENHANCED, OR PUNITIVE DAMAGES, REGARDLESS OF WHETHER SUCH PERSONS WERE ADVISED OF THE POSSIBILITY OF SUCH LOSSES OR DAMAGES OR SUCH LOSSES OR DAMAGES WERE OTHERWISE FORESEEABLE. IN NO EVENT WILL THE COLLECTIVE AGGREGATE LIABILITY OF SQL AND ITS LICENSORS, VENDORS, SERVICE PROVIDERS, AND SUPPLIERS UNDER OR IN CONNECTION WITH THIS AGREEMENT OR ITS SUBJECT MATTER, UNDER ANY LEGAL OR EQUITABLE THEORY, INCLUDING BREACH OF CONTRACT, TORT (INCLUDING NEGLIGENCE), STRICT LIABILITY, AND OTHERWISE, EXCEED THE AMOUNT PAID TO SQL UNDER THIS AGREEMENT DURING THE TWELVE-MONTH PERIOD IMMEDIATELY PRECEDING THE FIRST EVENT GIVING RISE TO LIABILITY. THE FOREGOING LIMITATION APPLIES NOTWITHSTANDING THE FAILURE OF ANY AGREED OR OTHER REMEDY OF ITS ESSENTIAL PURPOSE.

18. Force Majeure:

Neither party will be liable for any delay in performance or any failure in performance caused in whole or in part by reason of force majeure, which will be deemed to include the occurrence of any event beyond the control of the parties, including, without limitation, war (whether an actual declaration thereof is made or not), third party internet services, sabotage, insurrection, riot and other acts of civil disobedience, action of a public enemy, laws, regulations or acts of any national, state or local government (or any agency, subdivision or instrumentality thereof), judicial action, accident, fire, explosion, flood, storm or act of God.

Getting Started

The Sonora Quest FHIR API is based on the FHIR standard version 4.0.1. It is a RESTful API, where all resource requests are performed using HTTPS, the server responds with standard HTTP response codes, and data is returned in JSON format. Additionally, the API is secured using SMART authorization, which is built on the OAuth 2.0 standard.

You will need to complete a registration process before you will be able to access the API. Please fill out and submit the Sonora Quest FHIR API Registration Form to submit a request for access. This form can be accessed under the Test Results menu on <https://www.sonoraquest.com/patient/knowledge-center/>. Sonora Quest will review your application and, if approved, will provide you with the necessary credentials for authentication. Please allow up to one week for review of your application. If you have any questions about your application and/or the registration process, please contact appaccess@sonoraquest.com

API Endpoints

Sonora Quest has both a testing and production environments. These environments are represented in the following URLs:

Testing

Authorize URL: `https://test.sonoraquest.com/oauth/authorize`

Token URL: `https://sonoraquest-stage.luminatehealth.com/oauth/token`

FHIR API: `https://sonoraquest-stage.luminatehealth.com/fhir/r4`

Production

Authorize URL: `https://www.sonoraquest.com/oauth/authorize`

Token URL: `https://sonoraquest.luminatehealth.com/oauth/token`

FHIR API: `https://sonoraquest.luminatehealth.com/fhir/r4`

Authentication and Authorization

The Sonora Quest FHIR API uses [SMART authorization](#) ("SMART on FHIR"), which is built on the OAuth 2.0 standard, for authentication and authorization. This framework provides secure access to patient data by requiring that every resource request includes an access token (as the Bearer token) in the Authorization header. At a high level, retrieving an access token involves:

1. Initiating an authorization grant request (to the authorization server's authorize endpoint URL). This request contains parameters, such as scope, client ID, and redirect_uri.
2. Receiving an authorization code (from the authorization server) at the specified redirect_uri.
3. Submitting the authorization code for an access token (via HTTP POST to the authorization server's token endpoint URL).
4. Receiving an access token (from the authorization server) at the specified redirect_uri.
5. Receiving a new access token using a refresh token (via HTTP POST to the authorization server's token endpoint URL).

Access Tokens

To request an access token, an authorization request must be submitted to the authorize endpoint. Once the user authenticates using the user credentials, they will be asked to authorize access to the application. Then once successfully authorized, the authorization code will be provided to be exchanged for an access token via a POST request to the token endpoint.

The following information will be required in the request for authorization by adding the parameters outlined below to the query component of the authorize endpoint URL, using the “application/x-www-form-urlencoded” format. If successful, the authorization server returns a JSON response with the authorization code.

Authorize endpoint URL: <https://www.sonoraquest.com/oauth/authorize>

Request Parameter	Value
response_type	code (authorization code)
redirect_uri	Client's pre-registered redirect URI
client_id	The client's id from shared credentials
scope	A string that describes the access rights that the client application needs to operate properly. The supported scope values are: <ul style="list-style-type: none">• patient/Patient.read• patient/Observation.read• patient/DiagnosticReport.read• offline_access• launch/patient
aud	The url of the resource server
state	Value used by the client to maintain state between the request and callback. The authorization server includes this value when redirecting the user-agent back to the client.

Example

```
https://staging.sonoraquest.com/oauth/authorize?response_type=code&redirect_uri=[https%3A%2F%2Fredirect.myhealthapp]&client_id=1234567890&scope=patient%2FPatient.read+patient%2FObservation.read+patient%2FDiagnosticReport.read+offline_access+launch%2Fpatient&aud=https%3A%2F%2Fstage.luminatehealth.com%2Ffhir%2Fr4&state=10101010-2424-1111-1234-dda64d84b6b0
```

Response	Value
code	{authorization_code}
state	Value sent back with the callback

Exchange Authorization Code

After obtaining an authorization code, exchange the code for an access token via HTTP POST to the authorization server's token endpoint URL, using content-type application/x-www-form-urlencoded.

An authorization header using HTTP basic authentication is also required, where the user name is the client_id and the password is the client_secret. If successful, the authorization server returns a JSON response with the access token.

Token endpoint URL: <https://app.luminatehealth.com/oauth/token>

Request Parameter	Value
grant_type	authorization_token
code	{authorization_code} received from the authorization server
redirect_uri	One of the client's pre-registered redirect URIs.
client_id	client_id from the credentials

Response	Value
access_token	{access_token}
token_type	bearer
refresh_token	{refresh_token}
expires_in	integer in seconds for the access token.
scope	<ul style="list-style-type: none"> • launch/patient • offline_access • patient/DiagnosticReport.read • patient/Observation.read • patient/Patient.read
patient	{patient_id}

Sample JSON response containing the tokens and scope:

```
{
  "access_token": "{access-token}",
  "token_type": "bearer",
  "refresh_token": "{refresh-token}",
  "expires_in": "{integer}",
  "scope": "launch/patient offline_access patient/DiagnosticReport.read
patient/Observation.read patient/Patient.read",
  "patient": "{patient_id}"
}
```

Refresh Tokens

A refresh token can be used to replace an expired access token without user intervention. The refresh token is only available if `offline_access` was included in the scope of the authorization request. To request a new access token, issue an HTTP POST including the parameters outlined below to the authorization server's token endpoint URL, using content-type `application/x-www-form-urlencoded`.

An authorization header using HTTP basic authentication is also required, where the user name is the `client_id` and the password is the `client_secret`. If successful, the authorization server returns a JSON response with the new access token and refresh token pair.

Token endpoint URL: <https://app.luminatehealth.com/oauth/token>

Request Parameter	Value
grant_type	refresh_token
refresh_token	{refresh_token}

Response	Value
access_token	{access_token}
token_type	bearer
refresh_token	{refresh_token}
expires_in	integer in seconds for the access token.
scope	<ul style="list-style-type: none">• launch/patient• offline_access• patient/DiagnosticReport.read• patient/Observation.read• patient/Patient.read
patient	{patient_id}

Resources

The following table describes the FHIR resources supported by the Sonora Quest FHIR API. All resources are read-only, application/json format, and available via GET.

Element	Resource
Patient Name	Patient
Sex	Patient
Date of Birth	Patient
Laboratory Tests	LabResults
Laboratory Values/Results	LabResults (Observations)

Patient

The patient_id will be returned in along with the token. The GET request will pass in the id of the patient as a parameter to return demographics for a specific patient using the patient's identifier.

GET https://app.luminatehealth.com/fhir/r4/Patient?_id=300

Response Fields

The following fields may appear in a JSON response for the Patient resource.

field	description	type
id	patient identifier	string
name	family and given name	string
gender	the patient's gender	string
birthdate	date of birth	date
identifier	other identifiers	string

```
{
  "resourceType": "Bundle",
  "type": "searchset",
  "entry": [
    {
      "fullUrl": "https://app.luminatehealth.com/fhir/r4/Patient/300",
      "resource": {
        "resourceType": "Patient",
        "id": "300",
        "identifier": [
          {
            "type": {
              "coding": [
                {

```



```

        "system": "lh",
        "code": "EMPID",
        "display": "EMPID"
      }
    ]
  },
  "system": "lh",
  "value": "empid-abc-300"
}
],
"name": [
  {
    "family": "Tinsley",
    "given": [
      "Daisy"
    ]
  }
],
"gender": "female",
"birthDate": "1982-03-26"
}
}
]
}
}

```

Lab Results

The lab results for a specific patient can be retrieved with the `patient_id` that is provided in the response along with the token. The GET request will pass in the id of the patient as a parameter to return information on the lab result diagnostic reports and observations for a specific patient using the patient's identifier.

GET <https://app.luminatehealth.com/fhir/r4/DiagnosticReport?patient=300>

GET <https://app.luminatehealth.com/fhir/r4/Observation?patient=300>

Response Fields

The following fields may appear in a JSON response for the Lab Results resource.

Field	Description	Type
id	resource identifier	string
status	status of the lab result	string
category	type of observation	string
code	date of birth	date
subject	the patient associated with the results	string
performer	ordering provider	string
effectiveDateTime	collection date	date
issued	report date	date

result	Lab result reference to observations	string
valueQuantity	value of the observation	value, units
referenceRange	reference range of the observation	low, high, text

Sample response from Diagnostic Report:

```
{
  "resourceType": "Bundle",
  "type": "searchset",
  "entry": [
    {
      "fullUrl":
"https://app.luminatehealth.com/fhir/r4/DiagnosticReport/3000",
      "resource": {
        "resourceType": "DiagnosticReport",
        "id": "3000",
        "status": "final",
        "category": [
          {
            "coding": [
              {
                "system":
"https://www.hl7.org/fhir/codesystem-observation-category.html",
                "code": "laboratory",
                "display": "Laboratory"
              }
            ]
          }
        ],
        "code": {
          "coding": [
            {
              "system": "http://hl7.org/v2"
            }
          ]
        },
        "subject": {
          "reference": "Patient/300",
          "display": "Daisy Tinsley"
        },
        "effectiveDateTime": "2017-03-18T00:00:00+00:00",
        "issued": "2017-03-17T00:00:00.000+00:00",
        "performer": [
          {
            "display": "Physician Test"
          }
        ],
        "result": [
          {
            "reference": "Observation/30000",
            "display": "CHOLESTEROL, TOTAL"
          },
          {
            "reference": "Observation/30001",

```

```

        "display": "Triglycerides"
      },
      {
        "reference": "Observation/30002",
        "display": "LDL"
      },
      {
        "reference": "Observation/30003",
        "display": "HDL"
      },
      {
        "reference": "Observation/30004",
        "display": "Blood Glucose"
      }
    ]
  },
  {
    "fullUrl":
    "https://app.luminatehealth.com/fhir/r4/DiagnosticReport/3001",
    "resource": {
      "resourceType": "DiagnosticReport",
      "id": "3001",
      "status": "final",
      "category": [
        {
          "coding": [
            {
              "system": "system",
              "code": "laboratory",
              "display": "Laboratory"
            }
          ]
        }
      ],
      "code": {
        "coding": [
          {
            "system": "http://hl7.org/v2"
          }
        ]
      },
      "subject": {
        "reference": "Patient/300",
        "display": "Daisy Tinsley"
      },
      "effectiveDateTime": "2017-03-18T00:00:00+00:00",
      "issued": "2017-03-17T00:00:00.000+00:00",
      "performer": [
        {
          "display": "Physician Test"
        }
      ],
      "result": [
        {
          "reference": "Observation/30005",
          "display": "TSH"
        }
      ]
    }
  }
]

```

```

    }
  ]
},
{
  "fullUrl":
  "https://app.luminatehealth.com/fhir/r4/DiagnosticReport/3002",
  "resource": {
    "resourceType": "DiagnosticReport",
    "id": "3002",
    "status": "final",
    "category": [
      {
        "coding": [
          {
            "system": "system",
            "code": "laboratory",
            "display": "Laboratory"
          }
        ]
      }
    ],
    "code": {
      "coding": [
        {
          "system": "http://hl7.org/v2"
        }
      ]
    },
    "subject": {
      "reference": "Patient/300",
      "display": "Daisy Tinsley"
    },
    "effectiveDateTime": "2017-03-18T00:00:00+00:00",
    "issued": "2017-03-17T00:00:00.000+00:00",
    "performer": [
      {
        "display": "Physician Test"
      }
    ],
    "result": [
      {
        "reference": "Observation/30006",
        "display": "T4"
      }
    ]
  }
}
]
}

```

Sample response from Observations:

```
{
  "resourceType": "Bundle",
  "type": "searchset",
  "entry": [
    {
      "fullUrl":
"https://app.luminatehealth.com/fhir/r4/Observation/30004",
      "resource": {
        "resourceType": "Observation",
        "id": "30004",
        "status": "final",
        "category": [
          {
            "coding": [
              {
                "system": "http://hl7.org/fhir/observation-
category",
                "code": "laboratory",
                "display": "laboratory"
              }
            ]
          }
        ],
        "code": {
          "text": "Blood Glucose"
        },
        "subject": {
          "reference": "Patient/300"
        },
        "effectiveDateTime": "2017-03-18T00:00:00+00:00",
        "valueQuantity": {
          "value": 60.0,
          "unit": "mg/dl",
          "system": "http://unitsofmeasure.org",
          "code": "mg/dl"
        }
      },

```

```

        "referenceRange": [
          {
            "low": {
              "value": 61.0
            },
            "high": {
              "value": 100.0
            },
            "text": "61-100"
          }
        ]
      },
    ],
    {
      "fullUrl":
"https://app.luminatehealth.com/fhir/r4/Observation/30003",
      "resource": {
        "resourceType": "Observation",
        "id": "30003",
        "status": "final",
        "category": [
          {
            "coding": [
              {
                "system": "http://hl7.org/fhir/observation-
category",
                "code": "laboratory",
                "display": "laboratory"
              }
            ]
          }
        ],
        "code": {
          "text": "HDL"
        },
        "subject": {
          "reference": "Patient/300"
        }
      },
    },
  ],
}

```

```

    "effectiveDateTime": "2017-03-18T00:00:00+00:00",
    "valueQuantity": {
      "value": 53.5,
      "unit": "mg/dl",
      "system": "http://unitsofmeasure.org",
      "code": "mg/dl"
    },
    "referenceRange": [
      {
        "low": {
          "value": 35.0
        },
        "high": {
          "value": 59.0
        },
        "text": "35-59"
      }
    ]
  },
  {
    "fullUrl":
    "https://app.luminatehealth.com/fhir/r4/Observation/30002",
    "resource": {
      "resourceType": "Observation",
      "id": "30002",
      "status": "final",
      "category": [
        {
          "coding": [
            {
              "system": "http://hl7.org/fhir/observation-
category",
              "code": "laboratory",
              "display": "laboratory"
            }
          ]
        }
      ]
    }
  }

```

```

    ],
    "code": {
      "text": "LDL"
    },
    "subject": {
      "reference": "Patient/300"
    },
    "effectiveDateTime": "2017-03-18T00:00:00+00:00",
    "valueQuantity": {
      "value": 113.3,
      "unit": "mg/dl",
      "system": "http://unitsofmeasure.org",
      "code": "mg/dl"
    },
    "referenceRange": [
      {
        "low": {
          "value": 50.0
        },
        "high": {
          "value": 178.0
        },
        "text": "50-178"
      }
    ]
  },
  {
    "fullUrl":
    "https://app.luminatehealth.com/fhir/r4/Observation/30005",
    "resource": {
      "resourceType": "Observation",
      "id": "30005",
      "status": "final",
      "category": [
        {
          "coding": [
            {

```



```

        "system": "http://hl7.org/fhir/observation-
category",
        "code": "laboratory",
        "display": "laboratory"
    }
  ]
}
],
"code": {
  "text": "TSH"
},
"subject": {
  "reference": "Patient/300"
},
"effectiveDateTime": "2017-03-18T00:00:00+00:00",
"valueQuantity": {
  "value": 3.915,
  "unit": "µU/mL",
  "system": "http://unitsofmeasure.org",
  "code": "µU/mL"
},
"referenceRange": [
  {
    "low": {
      "value": 0.35
    },
    "high": {
      "value": 5.5
    },
    "text": "0.350-5.500"
  }
]
}
},
{
  "fullUrl":
"https://app.luminatehealth.com/fhir/r4/Observation/30006",
  "resource": {

```

```

"resourceType": "Observation",
"id": "30006",
"status": "final",
"category": [
  {
    "coding": [
      {
        "system": "http://hl7.org/fhir/observation-
category",
        "code": "laboratory",
        "display": "laboratory"
      }
    ]
  }
],
"code": {
  "text": "T4"
},
"subject": {
  "reference": "Patient/300"
},
"effectiveDateTime": "2017-03-18T00:00:00+00:00",
"valueQuantity": {
  "value": 9.8,
  "unit": "µg/dL",
  "system": "http://unitsofmeasure.org",
  "code": "µg/dL"
},
"referenceRange": [
  {
    "low": {
      "value": 4.5
    },
    "high": {
      "value": 12.0
    },
    "text": "4.5-12"
  }
]

```

```

        ]
    }
},
{
    "fullUrl":
"https://app.luminatehealth.com/fhir/r4/Observation/30000",
    "resource": {
        "resourceType": "Observation",
        "id": "30000",
        "status": "final",
        "category": [
            {
                "coding": [
                    {
                        "system": "http://hl7.org/fhir/observation-
category",
                        "code": "laboratory",
                        "display": "laboratory"
                    }
                ]
            }
        ],
        "code": {
            "text": "CHOLESTEROL, TOTAL"
        },
        "subject": {
            "reference": "Patient/300"
        },
        "effectiveDateTime": "2017-03-18T00:00:00+00:00",
        "valueQuantity": {
            "value": 184.0,
            "unit": "mg/dl",
            "system": "http://unitsofmeasure.org",
            "code": "mg/dl"
        },
        "referenceRange": [
            {
                "high": {

```



```
    },
    "referenceRange": [
      {
        "low": {
          "value": 10.0
        },
        "high": {
          "value": 250.0
        },
        "text": "10-250"
      }
    ]
  }
}
```

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