Orchard Software’s laboratory information systems provide you with tools to help maintain a highly efficient and productive laboratory despite tightening reimbursements, staffing challenges, and changing healthcare environments. Utilizing process automation, robust interfaces, and rules-based decision-support technology, Orchard’s systems address regulatory issues, improve efficiency, reduce errors, and assist with reimbursements. The design and development of Orchard® Harvest™ LIS, with ongoing input from our diverse user base, includes many powerful, flexible features capable of handling a variety of laboratory workflows and business situations. Harvest LIS is designed to be used for both clinical and environmental test data and contains special case management tools for public health laboratory testing.

**Systems Integration Expertise**
Careful programming and a team of interface specialists make Orchard the clear choice for “best-of-breed” integrated systems. Orchard specializes in seamless integration, which makes host system, EHR/HIS, billing, HIE, and reference laboratory interfaces standard, and linking multiple sites possible. Orchard is an expert in information systems integration and has successfully completed thousands of interfaces for our laboratory customers.

**Provide a Fully Integrated Solution**
With Orchard, instrument and system integration provides an automatic and seamless flow of data, allowing your laboratory to improve patient care by reducing errors, saving time, and speeding up the delivery of results.

**Structured Diagnostic Data Supports Lab Interoperability**
Structured diagnostic data, discrete and codified, is essential to the future of healthcare and the development and utilization of personalized medicine. Orchard’s systems store data in discrete fields that support interoperability between information systems, including EHR integration and enhanced data mining for correlation studies, analytics, regulatory measures, and quality assurance reporting.

**Exchange Structured Data Using Industry Standards**
Orchard’s systems use Logical Observation Identifiers Names and Codes (LOINC) and/or Systematized Nomenclature of Medicine—Clinical Terms (SNOMED CT) in HL7 messages to facilitate the exchange and pooling of results, and to optimize clinical care, outcomes management, and research.

**Advanced System Security**
Orchard’s systems’ security features include the use of Lightweight Directory Access Protocol (LDAP) authentication, extensive flexible password security options, and detailed role-based security setup options that allow for configurability of security settings by user. Additionally, all user actions are tracked to ensure appropriate systems and data access, including a complete audit trail of database changes.

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Data Analytics Support Business Intelligence
Orchard knows that one of the most important functions in any laboratory information system is the ability to use the data contained in the system for various reporting needs and quality assurance initiatives. Orchard’s systems provide the ability to easily and efficiently report information on any field in the database via an easy-to-use graphical user interface built directly into the software.

Orchard’s Data Analytic Tools Provide Valuable Insights
The numerous monitoring and reporting tools made available by Orchard’s data browsing strengths can generate valuable business and laboratory analytics. For example, monitor patient means by analyte to discover shifts between reagent lot numbers, or track specific diagnoses or abnormal test results to manage disease populations. Use performance analytics from Orchard’s data browsers to supplement EHR systems that might not be capable of compiling the information.

Pre-set Administrative Reports Add Value
Orchard’s systems offer an ever-expanding menu of pre-set report formats available for laboratory documentation and tracking. For inspection readiness, use the Test or Order Choice Utilization Reports to determine your test volume. Or select the Provider Utilization Report to track provider statistics, such as variations in ordering patterns. Report access can be configured according to employee security levels to ensure appropriate access.

Reports without Complicated Programming
Having all the data compiled in the LIS in a structured format allows the lab to have its own report writing tool, eliminating the need for separate data mining programs (e.g., Crystal Reports) or additional IT support to develop lab reports. Using the data mining tools, you determine search criteria and view results that match those criteria, compiling data from a multitude of different fields. Report data can be exported into Excel and scheduled to print, fax, or email at the desired time and specified location. Report graphs can be saved as an image file for easier interpretation.

Real-time Analysis of Lab Data
Monitor the status of the testing process in your lab minute by minute. Set up data mining browsers to update in a real-time scenario, allowing you to track the progress of each patient’s sample as it travels through the lab. Use Orchard’s data analytic tools to track provider utilization for variation analysis studies and to help determine best order sets for your patient population.

Perform Detailed Queries to Increase Productivity & Quality
Use Orchard’s data mining tools to write detailed queries and save criteria for recurring reports. For example, use the Result Browser to monitor a technologist’s or phlebotomist’s productivity or to determine the frequency of each order choice or test. Use the pivot table functionality to see trends and patterns at a glance or format the data into a pie or line graph with one click.

View examples of Orchard’s administrative reports at www.orchardsoft.com/AdminReports
**Medical Necessity Checking Made Easy**

With Orchard’s systems, maintaining your medical necessity checking is simple. The master ICD dictionary and National Coverage Determinations (NCDs) are available on Orchard’s website, and CodeMap® is included with support. Orchard’s systems automatically screen for valid diagnosis codes, testing frequency, and experimental procedures during order entry, flagging potential reimbursement issues and printing an ABN when required.

**Simplify Order Routing**

Order entry can involve multiple locations for ordering, collecting, processing, and testing. Configure Orchard’s systems to automatically split and route orders during order entry based on your criteria, making test ordering and billing more accurate.

**Use Rules to Document Problem Orders & Deliver Invoices**

The Reimbursement Problem Report documents all orders with medical necessity, frequency, and research reimbursement issues, which allows you to ensure claims are correct before submission and proactively address concerns with your providers. To streamline the billing process, users can create order entry rules that can fax and email invoices and requisitions as needed.

During the order entry process, Harvest LIS is hard at work behind the scenes making sure everything is working to allow your orders to be placed quickly and efficiently. Diagnosis codes are screened to ensure compliance, and the system will automatically prompt the user for an ABN acknowledgment upon a failed screen.
**Rules-based Decision-support Technology**

Orchard’s advanced configurable rules improve workflow efficiency and error-proofing by aiding in decision-making throughout the total testing process. This ensures the consistent execution of procedures and increases the productivity of your laboratory.

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**Cross-panel Rules Algorithm for Thyroid Testing**

Orchard’s systems’ cross-panel rules allow automation of reflex testing to help ensure that only necessary tests are performed.

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**Rules Facilitate Accurate Processing of Lab Orders**

Use order entry rules to manage test orders. Split an order into two or more orders based on sample handling requirements, tube types, sample types, testing locations, etc., or when orders need to be deferred because of a batch testing schedule to ensure that no tests are missed and specimen storage requirements are met.

**Automatic Label Printing Rules Increase Patient Safety**

Bar code label rules can help streamline the processing area of the laboratory by automatically printing labels when certain tests are reflexed or by printing master labels for batch scanning of laboratory requisitions. Additionally, Orchard’s systems implement the Clinical & Laboratory Standards Institute (CLSI) recommended label printing format—AUTO12-A—to comply with industry standards and to reduce errors associated with the lack of bar code label standardization in laboratories.

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**Enhance Test Utilization**

As monitoring of test utilization becomes more important, Orchard’s systems’ decision-support rules allow users to work closely with ordering providers to eliminate obsolete testing, avoid unnecessary test combinations, and eliminate non-value added tests, contributing to overall improvements in the quality of patient care.

**Develop Sequential Test Protocols with Cross-panel Rules**

Cross-panel rules allow rule conditions to be based on results from multiple tests within a panel or order, thereby simultaneously supporting low and high testing cascades that promote the most efficient testing sequences for providers and their patients. This ensures that only necessary testing is performed, eliminating waste and saving healthcare dollars.

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*Adapted from “Thyroid Cascade Testing,” 2007. LabCorp, Inc.
Result Auto-verification Maximizes Efficiency

Improve productivity by using Orchard's result evaluation rules to set up auto-verification of "normal" results, freeing up valuable tech time to concentrate on other intensive job duties and allowing you to increase productivity without adding FTEs. Depending on your lab menu and patient population, 40% to 80% of results can qualify for auto-verification.

Automate QC with Rules

The rules available in Harvest LIS to set up and monitor quality control are time-saving and enable thorough preparedness for inspection of your laboratory’s QC. Rules are available to automatically order QC when a test is ordered; to auto-verify acceptable QC; or to stop test approval until QC is ordered or approved, ensuring that no patient test results are approved without proper QC.

Rules Enable Multiple Result Delivery Options

Eliminate time-consuming, error-prone manual steps by using Orchard’s systems’ rules for result delivery. You can automate the delivery of reports based on many conditions, including the provider, order location, draw location, test location, reporting group, or order priority.

Streamline Billing with CPT Code Rules

Having a billing interface in place can improve coding accuracy and therefore increase reimbursements. Design CPT code rules to automatically consolidate or change billing codes when testing conditions require it. For example, users can add required billing modifiers or change a CPT code from a screening code to a diagnostic code based on ICD and insurance carrier.

Use Rules to Schedule Messages that Improve Workflow

Eliminate “sticky notes” with Orchard’s systems’ Message Center—a simple and extremely useful tool that can be utilized to enhance laboratory workflow and facilitate communication. For example, reminder messages can be scheduled for specific workstations interfaced to analyzers on the day and time of a scheduled maintenance or on a linearity testing due date, making it easier for technologists to remember important “to-do” items.

Rule setup is intuitive and convenient, with all available conditions and actions displayed in an easy-to-use graphical user interface.

Of the many database tables available in Harvest LIS, a large number are devoted to rules-based decision making.
Optimize Workflow Management
Orchard’s systems’ audit trail, statuses, and sample tracking features provide laboratories the tools to organize and track laboratory samples and specimens throughout the testing process and into storage, making it easy for laboratorians to locate specimens during testing as well as facilitating quick retrieval of stored samples.

Storage Audit Trail Integrated into Patient Record
Patient files contain a Sample Storage History button that displays the complete history—from creation, through each transfer, to disposal. When determining if you have a viable sample for an add-on test, you can quickly look at the history for that patient without searching through the sample storage rack.

Organize Your Workflow Process
From order entry to result delivery, through accessioning, quality control, and sample storage, you can configure every detail of the process to your laboratory’s specific needs and track them with Orchard’s user action and change logs. Orchard’s systems employ modifiable statuses to categorize samples by department, analyzer, review status, etc., and you can automatically route samples to an updated status based on bar code, parsed results, or result approval.

Review Results Process
In order to organize the review of large volumes of patient orders, Orchard’s systems provide dynamic pending worklists that can be configured to user preference. Easily view “overdue” results and visualize turnaround times with optional columns and color views.

Streamline Transfer of Samples to Storage
The sample tracking tool organizes and tracks the storage of laboratory samples and specimens to facilitate quicker, easier retrieval. At the time of order entry, sample storage is integrated into your system, making retrieval easy. Rather than searching through tubes or slides to review dates, you can easily track expired items in the sample tracking system, and the system can alert users when items have reached their expiration.

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**Workflow with an LIS**

**Provider’s Requisition**

- Patient demographics are automatically received from the EHR or PMS; orders are placed in the LIS; diagnosis codes are confirmed.

**Order Preparation**

- Orders in the LIS are accessioned and incomplete orders are flagged for review. Based on insurance and lab preferences, tests are automatically routed to the appropriate testing location or outside lab.

**Sample Collection**

- Collection requirements and test and patient information is available on the bar code label. ABNs are printed as necessary.

**Testing**

- Bar coded specimens containing patient and testing information are placed on analyzers for sampling. Appropriate QC is assured before reporting results.

**Result Delivery**

- Results from analyzers and reference labs are compiled into a single report and sent to the EHR or faxed, emailed, or web-delivered to the appropriate provider(s).

**Billing**

- Upon approval of results, billing information is automatically sent to the billing system or PMS electronically.

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Streamline lab processes from ordering through reporting with the advanced capabilities in Orchard’s lab systems.
Quality Control

With Harvest LIS, sophisticated quality control features make QC management quick, efficient, and easy. Configurable Westgard Rules and extensive support for qualitative and quantitative QC help you get the most from your quality control data and perform well on inspection.

Levey-Jennings Graphs Make QC Monitoring Easy

Orchard’s systems’ quality control includes easy-to-maintain, comprehensive Levey-Jennings graphs that organize and simplify management of your laboratory’s QC. Create supervisory review comments and insert them at an individual data point or date range. Save valuable time by reviewing Levey-Jennings graphs of multiple levels or multiple graphs on one screen.

Smart QC Graphs

On your Levey-Jennings graphs, if you update a mean in the middle of a lot number, the historical QC data is not affected. The graph correctly represents the QC data based on the applicable mean at the time of run. You can add peer means and SDs to the QC graphs for comparison. Also, the system can suppress out-of-range results, removing them from the mean and SD calculations, and unsuppress them as needed.

Link QC Assay Sheets

Right in the QC file, you can scan and link the QC assay sheets so that when the inspector reviews your QC in Harvest LIS, the assay values are readily available.

Immediate Electronic Access to QC Records

Eliminate bulky, hard copy QC files by using Orchard’s systems to electronically store your qualitative and quantitative QC data, making it easy to retrieve current and expired QC records for review.

Display Parallel QC Studies for Inspectors

Meet the requirement for overlapping QC lot numbers with ease—you can display both lots simultaneously on the same Levey-Jennings graph for your inspector’s review.
QC Rules Ensure Compliance

QC auto-scheduling ensures that you never have to worry about missing a QC frequency requirement (e.g., running Protime QC every eight hours). Orchard’s systems can manage QC for infrequently ordered tests so that when they are ordered, the system automatically orders the associated QC. To further ensure compliance, rules can be put in place that prevent release of results without acceptable QC.

QC can be preconfigured to run on a set schedule, requiring little FTE support, thus increasing efficiency.

Right in the QC file, you can scan and link the QC assay sheets so that when the inspector reviews your QC in Harvest LIS, the assay values are readily available as well.

In addition to scheduling the QC to run automatically, you can schedule QC reports to run at predetermined intervals. The reports can be set to print or export as desired.

Users can enter comments directly within the QC file, keeping everything in one place and viewable on one screen.

QC rules allow auto-scheduling of appropriate QC and can prevent the release of results if acceptable QC results have not been obtained, automating fulfillment of regulatory requirements and helping to ensure accurate patient results are reported.
Analyzer Support Tools Reduce the Need for Middleware
Instrument interfaces are essential to the laboratory’s collection of data. Orchard offers a multitude of helpful ways to monitor and support analyzer interface processes, including maintenance reminders, assistance in documentation of maintenance, tracking of interface transmissions, and a live dashboard to view interface statuses.

Multitude of Instrument Interfaces
With more than 1,500 installations across the country, Orchard offers a wide variety of instrument interfaces for multiple laboratory disciplines, including many unique ones. If a new instrument interface is needed, Orchard will write it.

Conveniently Graph Linearity & Calibration Verification Values
Create and store inspection-ready linear regression graphs of your analyzers’ initial linearity study or calibration verifications, depicting slope, y-intercept, and coefficient of variation. In the linearity graph, users can set up levels, number of runs, and omit outliers as needed. Intuitive filters are available to ease tracking of numerous linearity graphs.

Instrument Maintenance Files
Set up instrument maintenance files to automatically alert users to required maintenance for each laboratory analyzer, creating an electronic record of the performed maintenance, readily accessible for inspection. You can even set automatic default criteria with a custom choice list for desired maintenance tasks.

Use Dashboard Display for Interface Status
Conveniently located within your application window is a configurable dashboard display that indicates the current status of each analyzer interface. Through this dashboard, users are immediately informed about any interface issues and can address them in a timely manner.

Monitor Analyzer Transmissions
To assist labs in maintaining their interfaces, the system tracks each analyzer transmission into the LIS. This can be used as a valuable troubleshooting tool. Also, interface transmissions can be reprocessed if there was a temporary break in communication.
Create Configurable Load Lists
Create instrument load lists with configurable columns that you can print or export by clicking selected patients with the desired test ordered into the carousel order—ready for placement on the analyzer. This documents carousel position and keeps an organized list of patients in each batch.

Electronically Upload Proficiency Testing
Orchard’s systems are capable of exporting proficiency testing (PT) results and transmitting directly to the proficiency testing provider, saving time and eliminating the possibility of clerical errors from manually-typed PT data.
Patient Records
Create a paperless lab with Orchard’s systems. Patient records are electronically filed, easy to access, and readily available to view, print, fax, email, or web deliver. Eliminate the frustrating, time-consuming task of manually locating and faxing lost or historic patient reports.

Historical Results at Your Fingertips
Orchard’s systems simplify searching for historical patient information because all patient data is electronically stored in a consolidated patient record easily retrieved with a variety of search criteria. Using Orchard’s systems’ electronic outreach options, you can give your providers their own direct and secure access to patient records from any web-enabled PC, eliminating phone requests for historical data.

Easily Track Patients with Outstanding Lab Orders
To facilitate a patient-centered care approach, printing of letters to notify patients of their overdue lab tests can be automated, creating mail-ready letters. This process saves time and helps ensure necessary tests are not overlooked, potentially delaying patient treatment.

Scanned Documents & Image Support
Links are available throughout the software—from scanning in paper requisitions and ABNs, to linking QC assay sheets and package inserts to QC files, or linking scanned diplomas to specific personnel—making systematic storage of documents easy. Orchard’s systems also allow you to annotate linked images and add descriptive text on reports, enabling easier interpretation of the results.

Auto-archiving Scheduled at your Convenience
Archive procedures are intrinsic within Harvest LIS and can be scheduled to take place at your convenience. Archived records remain within the patient’s historical file and are easily accessed by right-clicking.

The Results Explorer tab displays a comprehensive history of the patient’s orders and results in a single window. Here, results can be viewed, redelivered, edited, graphed, and much more.

The Patient Info tab displays all pertinent information for each patient. All demographic information, previous orders, recurring orders, alerts, comments, attached documents, and more are viewable from this tab.

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Multiple Reporting Options
Because both the diagnostic data provided in a graph format and the import of discrete data are of significant value, Orchard's products are capable of sending both discrete data and a PDF report. Numerous configurable options are available that allow the use of graphics to assist the clinician with a speedier diagnosis.

Configurable Patient Report Layout Template
Orchard’s systems offer various standard patient report formats, as well as the tools to allow you to create multiple custom report formats for your facility or for individual providers. Configurable reports can be created to meet the needs of individual providers or facilities so that each provider can have their own report format. Users can add logos, graphics, and colors to brand reports for a specific facility.

Enhance Reports with Graphics
Incorporate color graphs to visually document result trends, highlight abnormal and critical values, and enhance patient education. Depending on your report settings, you can also include age- and gender-based reference ranges, as well as patient, order, or individual test-level comments.

Track Patient Progress with Result History Graphs
The system can present historical results in a graphical format that clearly shows a patient’s progress and facilitates decision-making. Simply hover the mouse over a specific data point on the graph for detailed run-time information, or type in pertinent comments prior to printing the graph.

View examples of Orchard’s patient reports at www.orchardsoft.com/PatientReports

The built-in Image Editor in Harvest LIS allows users to customize the format of their reports. The Image Editor allows the user to drag and drop fields, draw lines, add images and/or text, and much more.

Easily track a patient’s progress with result history graphs. Colors can be used to point out specific areas of importance and enhance ease of viewing.
Automate Result Delivery to Provider Preferences
Orchard’s rules-based result delivery technology provides the flexibility to set up auto-delivered reports and courtesy copies in the format each provider prefers. You can create global schedules for automatic result delivery, as well as printer-specific schedules, if desired. Use the Result Delivery Log to verify or track report deliveries, creating clear documentation that confirms delivery.

Orchard Harvest Webstation
Orchard® Harvest™ Webstation, used as a module with Harvest LIS, gives web access to users within a single business entity, with a focus on low cost for implementation and general simplicity. It is designed to help laboratories serve providers who need access to place orders and retrieve patient results via the Internet.

Intuitive Electronic Worksheets
Orchard’s systems’ electronic microbiology worksheets are intuitive and easy to use, and they save time and simplify data management. Microbiologists can quickly and easily record observations and create and approve results. Once you place the original microbiology order, you can add additional tests or order choices directly from the electronic worksheet without the need to repeat the order entry process.

Analyzer Interfaces Eliminate Transcription Errors
With interfaces between Orchard’s systems and your microbiology analyzers, data flows electronically, eliminating transcription errors and saving time.

Bar Code Scanning Saves Time
To improve efficiency, use the bar code scanning feature to locate and open the correct electronic worksheet for editing. You can also access the batch results function to quickly add standard documentation to multiple microbiology order choices for one or more patients.

Configurable Result Delivery Options
Enhance the value of your laboratory to providers with Orchard’s configurable result delivery options. Upon approval in the lab, reports can be printed, faxed, emailed, web delivered, or sent to a host system to meet providers’ individual needs, allowing you to communicate results in a timely and sophisticated manner.
Batch Processing
For laboratories that use batch order entry, Harvest LIS allows users a manual or import batch entry option to facilitate the entry of multiple orders (e.g., de-identified patients for clinical trials). Users can create and save criteria for different batch orders.

Microbiology Uses Rules-based Technology
Write rules for automatic interpretation of manual susceptibilities, MICs, and CLSI-deduced drugs based on lab-defined criteria. Use reflex rules to add additional microbiology tests to the electronic worksheet based on the results of other testing. Write microbiology threshold rules, document Kirby-Bauer zone sizes, and provide interpretations based on organism, antibiotic type, and source. Automate release of negative blood cultures to improve efficiency and expedite appropriate patient treatments.

Automated Billing
You can configure Orchard’s Microbiology Module to bill automatically, including IDs and sensitivities, allowing you to ensure capture of this important source of revenue. You can set up the billing interface so that only completed testing is sent to the billing department, assuring that billing is accurate and meets compliance guidelines.

Easy Reporting for Quality Assessment or Outside Agency Review
Use Orchard’s systems’ Result Browser to generate pertinent reports required for quality assessment, infection control committees, and public health departments. A built-in Antibiogram Report that is fully CLSI compliant allows you to easily retrieve this essential information.

Support for Antimicrobial Stewardship
Orchard’s systems provide advanced tools to support your facility’s antimicrobial stewardship efforts, including antibiograms, ad hoc reporting, and epidemiology reports.

ELR/LRI for Public Health Reporting
Orchard’s systems stay up to date on HL7 interfacing requirements, including the use of standards-based information architecture, such as LOINC and SNOMED CT, to facilitate Electronic Laboratory Reporting (ELR) and the Laboratory Results Interface (LRI) initiative to electronically report test results to health departments, state surveillance systems, and the CDC for surveillance purposes.

Support Emergency Preparedness & Response
Public health laboratories can easily email reports for individual patients or order choices to send specific Laboratory Response Network for Biological Terrorism (LRN-B) results to the Medical Review Officer for the county and state, aiding in emergency preparedness and response initiatives.
Orchard’s Valuable White Papers

Orchard understands the important role of laboratories and provides the strategic partnership that successful labs can depend on to meet their patient care goals. Orchard offers a white paper series to keep you informed about the lab’s role in the changing healthcare environment, with topics such as point-of-care testing, analytics, test utilization, and molecular diagnostics.

www.orchardsoft.com/whitepapers/

From the seeds sown in our first installation in 1993, Orchard Software continues to grow and develop a comprehensive suite of lab information system solutions that empower the lab. Simply said, we are the best, and that is why laboratories of all shapes and sizes are harvesting the power of Orchard.

Orchard Software

Harvest the Power