

# PenRad™ Technical Bulletin:

## Optimizing Productivity and Revenue in Breast Imaging

Increasingly clinicians are handling more images, data and protocols on a daily basis within their women's imaging program. PenRad's suite of products enhance interpretive reporting, tracking and management of clinical data, ultimately optimizing productivity and revenue.

### A Total Solution for Breast Imaging

PenRad offers a total solution for breast imaging, enhancing practice workflow. Designed flexible and for easy integration, PenRad's client/server SQL enterprise architecture supports all customers ranging from individual imaging facilities to enterprise wide diagnostic clinics. Always maintaining individual statistics, workflow and automation needs for each facility. Products include:

**PenView**, powered by EBM Technologies, is a complete reading workstation for breast imaging. As a flexible, cost-effective software solution, PenView can integrate breast MRI and ultrasound CAD, and MIS reporting, along with PenRad's full suite of patient care workflow solutions. Penview is a web-based, diagnostic, multimodality workstation which handles every aspect of patient image and information management.

**Compass** for breast MRI provides radiologists with the time sensitive information needed to maximize productivity when interpreting and reporting complex studies. Compass makes economic sense as a software only program – costing tens of thousands less than the typical MRI-CAD system. As an integrated solution with PenRad MIS, users can be assured computer generated visualization data can be used for auditing and accreditation purposes.



**PenRad MIS rated #1  
Mammography Information  
System—three consecutive years**



**B-CAD®**, ultrasound CAD, provides advanced decision-making support for lesion analysis based on the ACR BI-RADS®.

**PenRad MIS** significantly improves professional productivity, quality and revenue in mammography reporting workflow. PenRad MIS automates tasks, and eliminates duplication, secondary data input and transcription.

PenRad MIS produces narrative reports for all breast procedures and DEXA studies. PenRad MIS generates complete sentences and paragraphs with proper grammar from its graphical interface by tapping on keywords allowing various levels of detail without navigating through series of cascading drop down menus. The narrative report warns radiologists of inconsistencies and ranks order of findings based on level of severity. With our PenProfiler system, radiologists confirm findings instantaneously with over a million abnormalities as a clinical support tool.

When PenRad MIS is used by the radiologist, synchronization with a softcopy workstation allows access to prior reports and a visual recap of the patient's history and risk factors. PenRad MIS' auto-clone technology duplicates priors allowing one tap reports. Radiologists can use their own macros and supplement reports via voice recognition or transfer cases for transcription and review. PenRad MIS facilitates report

distribution through the HL7 engine to the RIS and/or via paper and fax distribution immediately.

**PenAutoReader** semi-automatically processes exams by utilizing adaptive learning and pattern recognition technology to eliminate the need for manual data input and extracting key data phrases for each exam type by each radiologist directly from the text of the narrative report. This automates exam tracking and provides a copy of the narrative report in the database for reports not generated within the system via voice recognition or transcription.

**PenTrac** automates tracking and management of patient exams, recalls and reminders letter generation, statistics and MQSA reports, unresolved exams, pathology correlation, and electronic or paper history worksheets, saving time and money. Available as a hosted web service or it can be installed locally. Additionally, PenTrac has an easy upgrade path to full PenRad MIS for comprehensive reporting.

PenRad's **HL7 engine** automatically maintains patient demographics, appointments and order information, eliminating the need for manual entry. Results and status change are returned to EMR.

**PenConnect**, patient communication solution, can reduce mailing and handling costs by 60% for exam, and recall/reminder letters by providing instant exam results by voice message and/or secure email. PenConnect can also reduce patient anxiety. Automatic printed letter generation occurs if there is no response to electronic distribution.

Whether integrating with existing infrastructure or providing a complete solution, PenRad partners with customers to optimize efficiency and productivity.



## PenRad Optimizes Workflow in Breast Imaging

### The Most Advanced Technology Available

- **Client/Server technology:** LAN/WAN enterprise capability, Citrix, terminal services, web, off-line (mobile imaging)
- **SQL Server:** MS SQL relational, robust, automatic re-index, logs and backup
- **MS Word:** document format flexibility for patient letters and exams including customization of font and images
- **Crystal administrative reports:** advanced statistical reports allow print and export (i.e. Excel, tab, PDF, etc.)
- **System interfaces:** compatible with HIS/RIS systems, DICOM and softcopy

### Comprehensive Breast Center Information System

- **Captures patient data once:** no need re-enter patient information
- **Bar-Code awareness:** instant errorless identification by exam accession and patient MRN
- **Paperless files:** online repository for prior exams, history, risk and correspondence
- **Interactive patient interviews:** eliminates errors and saves patients time, or update with wireless or kiosk tablet
- **Captures referral information:** simplifies management of referral patterns for enhanced marketing
- **Information system:** tracks all data automatically, common access for exam results and patient information
- **Medical auditing:** statistical data by personnel and/or by location for MQSA audits and more
- **Complements workflow:** increases efficiency and productivity for radiologists and technologists
- **Increases productivity:** focuses staff on efficient patient throughput and service versus clerical tasks
- **Tap-not-type technology:** allows collection of data with sliders and narrative reports from just a few key words

### Reliable Support and Upgrades Protect Against Obsolescence

- **24/7 Connection:** instant online support with access to a application specialist at no charge
- **No hidden costs:** all PenRad software upgrades are covered in license agreement
- **Best in KLAS MIS:** As *Best in KLAS* for MIS leader for three consecutive years, PenRad is the industry leader in MIS

Solutions for productivity and revenue optimization in radiology workflow

Learn more: [penrad.com](http://penrad.com) | [sales@penrad.com](mailto:sales@penrad.com) | 763.475.3388

## Narrative Report Generation for Improved Efficiency and Turnaround

- **Narrative reports generation:** automatic, complete grammar and correct sentence/paragraph generation based on keywords
- **Auto-Clone technology:** automatically clones findings between various exam types for tracking
- **One-button negatives:** automatically clones report as previous with findings, tissue, etc.
- **Auto lesion location:** auto calculation of depth, clock & quadrant on graphical screen
- **Voice control and command:** provides audible patient info, control and feedback for report generation
- **Report generation imaging:** Mammo, US, MRI, BSGI, PET, PEM, Brachy, Specimen, Localization
- **Report generation biopsies:** Aspiration, FNA, Stereo, US, BSGI, MRI
- **Report generation other exams:** Cryoablation, Ductogram, Sentinel node, Dexa, CBE, Consultation
- **Voice integration:** allows free-text addition or complete report with various VR products
- **Dexa comparison:** automatically calculates year to year changes
- **Preliminary and final report:** facilitates distribution of preliminary and final reports by HL7, fax and email
- **Amendments:** unlimited and facilitates multiple radiologists, and amendment patient letters
- **2nd and multiple reads:** supports resident and multiple staff reads with agree/disagree capabilities
- **Capture images within report:** unique system allows attachment of ROI and descriptors into report
- **Referring preferences:** automatically filters exams based on preferred radiologist or not preferred
- **Full screen templates:** no drop downs, increases efficiency, allows defaults by radiologist
- **Graphic report presentation:** visual indicators for referring physicians, staff and surgeons
- **Risk assessment statements:** automatic and conditional for 5-year, lifetime risk models and breast density
- **Patient consent:** by radiologist and exam type, facilitates custom specific JACO information
- **Built-in spell check:** pre-reads exam for added free text or exams and custom letters
- **Common voice from radiology:** benefits referring physicians for concise reports and recommendations
- **Inconsistency checking:** checks findings, recommendations and recall as well as clinical information
- **Unresolved case reminder:** verifies during current exam interpretation of any outstanding recommendations

## Assessment and Clinical Support Tools

- **Hughes risk assessment:** integration with BRCAPRO, MMRPRO, CLAUS, GAIL and MYRIAD models
- **Risk assessment:** leading built-in real-time assessment calculations
- **Clinical abnormality profiler:** returns pathology on similar morphology from local and national databases
- **NMD and NQNBC survey:** prepares NMD and NQNBC Center of Excellence statistics for submittal

## Correspondence

- **Navigator system:** tracks patients and contacts through various procedures and treatments
- **Patient task reminder:** reminds staff of daily/weekly follow-up tasks
- **Faxing system:** faxes cover letter summary as batch or real-time on exam approve
- **Phone results system:** allows patient to hear results immediately with choice of receiving letter
- **Patient reminder by phone:** calls patient to remind of appointment saving mailing expense
- **Physician email:** physician can receive exam results verses fax or not part of enterprise RIS
- **Patient correspondences:** multi-language to improve communication for exam, recall and reminders
- **Patient history sheet review:** displays prior info in multi-language to improve communication with patient
- **Patient wireless or kiosk:** allows patient review and capture history on tablet with browser
- **No-patient-left-behind:** automatic process that generates recall reminders and past-due letters
- **Unresolved exams:** prepares correspondence for cases without resolution
- **Windowed envelope format:** personalized, accurate mailings or compatible with print and fold units
- **Dynamic letter templates:** unlimited and automatic with bookmarks producing a customized appearance

## Flexible Integration

- **AutoNext SoftCopy control:** initiates the display of next study and caching for increased productivity
- **Dynamic work-list status:** displays work in progress, filters by exam type, status and assigned cases
- **Synchronization integration:** bi-directional patient/exam with PenRad MIS and SoftCopy
- **DICOM SR generation:** creates SR for PACS from narrative report
- **Voice recognition:** application login with various third party engines and with Windows Speech

- **DICOM work-list provider:** provides DWL to current orders or access to priors. (HL7 to DWL)
- **CAD SR integration:** inherits breast density and abnormalities from mammography CAD
- **PenFetch image transfer:** automatic system, finds & selects priors and routes by exam type to workstation(s)
- **Pre-fetch and routing:** initiates on time schedule or on demand image transfer to various locations
- **Alternator correlation system:** identifies and tracks film location for interpretation
- **Misplaced film tracking system:** records location during interpretation for locating previous years studies
- **Pathology correlation module:** screening and diagnostic statistics, along with pathologist report attachment
- **Integration with Compass for Breast MRI:** direct view and import ROI images into narrative report
- **Integration with CADstream MRI-CAD:** inherits abnormalities descriptors, location and size -- displays CAD report
- **Integrated US B-CAD system:** built-in US viewer, imports CAD results and images into report, allows technologist to analyze collected images and process results to radiologist to increase productivity
- **HL7 2-way:** real-time or batch, process ADT, orders and results, builds patient and physicians from orders, supports preliminary, finals and amendments, status change, supports various result formats. Process scheduling messages. Can create orders within PenRad MIS. Offers location specific work-list by facility. From HL7 orders a DICOM work-list can be provided by modality.
- **PenAutoReader technology:** automatically extracts high level tracking data from free text exams via HL7. An option for facilities that use VR, transcription or prefer free form narrative reports while having the access to all the other features provided in PenRad MIS.

### Integrated Appointment Scheduling:

- **One-glance presentations:** instant view of all rooms, procedures or patients
- **Daily quick view screen:** each room for any day, month, or year
- **Letter display screen:** prints appointment reminders and no-shows, and daily schedules
- **Procedure information:** prints exam specific instructions
- **Directional information:** prints specific directions to each room
- **Schedule list:** prints daily schedule with film pick list
- **Custom format:** customized for each site with multiple schedules
- **Optimizes utilization:** instantly defines all information at-a-glance

### Analog and Digital QA/QC

- **One-glance display:** displays operational status of each system and piece of equipment
- **Auto-remind function:** instant status visualization of entire facility by device schedule
- **Independent reminder schedule:** displays cassettes and repeat analysis
- **Curriculum vitae:** display of education credits
- **Variance-alert:** crossover, density and phantom values
- **Complete module:** tracks multiple imaging and reading areas

### Reading Solutions

**PenView SoftCopy:** Complete IHE compliant review workstation with dynamic hanging protocols by radiologist and by exam type and tissue, automatic sequencing based on comparisons, SR and GSPS, CAD overlay, various mouse driven imaging tools, measuring and annotation capabilities, key image, drag and drop technology for images, attach voice to image, displays MG, US, MRI, Dexa, NM, CT, DR, SC, SR. As a web-based viewer, PenView allows real-time chat and drawing between technologists and physicians everywhere. Allows clipping of regions of interest to appear in reports, imaging gallery and library, and for application of CAD.

**Compass for Breast MRI:** As an intuitive computer-aided software only solution, Compass automates analysis of studies for improved workflow in breast MRI. Compass automatically processes studies as soon as they are received from the MRI scanner, allowing studies to be read in just a few minutes. Compass delivers no "failures to process" and with an easy to use user interface requires no on-site "super user." Real-time dynamic threshold setting and peak series adjustment allows for no downtime while study is reprocessed. Compass is easy to install and can be loaded on any PC meeting minimum specifications. When integrated with PenRad MIS, Compass data can automatically be used for breast MRI reporting, tracking and practice statistics.

**Optimize your Breast Center with PenRad—  
attend at a 'live' demo.  
Visit [penrad.com](http://penrad.com) for details.**

7/28/2011 730-23-00009 AA ©2011 PenRad Technologies, Inc.