



the diagnosis checklist

Success Story

Maria Fareri Children's Hospital

Maria Fareri Children's Hospital (MFCH) is a major teaching facility associated with Westchester Medical Center, an academic health affiliate of New York Medical College. With a dedicated staff of more than 150 pediatric specialists involved in research, developing tomorrow's treatments and in training the children's health care providers of tomorrow, MFCH is leading the way in incorporating innovation into their programs. MFCH provides a state-of-the-art environment for clinical, educational, and research activities. MFCH is a full-service children's hospital with complete pediatric subspecialty representation. Family-centered care is at the core of their mission and all Children's Hospital students, residents in the pediatric residency program at New York Medical College at Westchester Medical Center and other trainees learn that the active involvement of families in the healing process — whatever the illness — is an important part of helping children recover and stay well.

Enhancing Diagnostic Skills

The ability to access, appraise, and use information is critical in contemporary medicine. At MFCH the pediatric residents are honing their diagnosing skills under the guidance of the chiefs and program directors. A key element is the ability to create a differential diagnosis list, especially for those patients that are less than routine. Diagnostic reasoning is complex, requiring the clinician to distinguish between subtle differences in presentation of diseases and pattern recognition. A common pitfall in diagnosis is premature closure, a phenomenon where a physician considers a patient's symptoms to be evidence of one specific diagnosis and then stops considering other reasonable possibilities, leading in practice to possible delayed or mis-diagnosis. Providing tools and support to enhance those critical thinking skills can be a valuable component in their development and allowing them to consider other possibilities.

"Isabel allows one to expand the list of possibilities and provides access to information to pursue alternatives in a data driven manner. It is also a powerful recall tool as it reignites information that one has learned at one time but cannot access in one's brain. The ability to review possible alternative diagnosis provides a platform for Residents to learn and hone their diagnosis skills."



Matthew J. Kapklein, MD, MPH

Program Director, Pediatric Residency Program at New York Medical College at Westchester Medical Center and in Maria Fareri Children's Hospital

Benefits of Isabel at MFCH

In those cases where the patient is not responding to treatment or things are not adding up, Isabel provides a platform for the residents to consider alternative possibilities and quickly research them and consult with peers and specialists. Isabel also provides a framework during case presentations for broadening the differential and discussion about why or why not some suggestions should be added to the differential list, another great learning opportunity for residents.



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MFCH Patient Case Example

Dr. Matthew Kapklein, Program Director of the Pediatric Residency Program at MFCH describes a case where Isabel played a key role in expanding the differential. He was starting his on call rotation in the PICU and one of the patients, a 2 month old with a diagnosis of ARDS caused him some concern as the baby had a history of multiple intubations. He was uncomfortable with the baby's presentation as a bit "off" and felt further consideration was needed. He entered the clinical features ARDS and hypertriglyceridemia into Isabel and two diagnoses appeared that had not been considered. After careful review, he was able to rule out one of them and so one remained for investigation - Hemophagocytic Lymphohistiocytosis. He consulted hematologists and they felt that Hemophagocytic Lymphohistiocytosis was unlikely, but he decided to not rule it out and ordered a bone marrow aspirate and biopsy. The result of this biopsy provided the needed data to confirm Hemophagocytic Lymphohistiocytosis as the final diagnosis and they began appropriate treatment accordingly.

The screenshot displays the Isabel Healthcare interface, which is divided into two main panels: "enter clinical features" and "possible diagnoses".

enter clinical features panel:

- age***: infant (29d-1yr)
- gender**: ☐ female ☒ male
- Refine search:**
 - travel history:** North America
 - show me:**
 - ☒ diagnoses
 - ☐ causative drugs
 - ☐ bioterrorist agents
- Enter abnormal clinical features, no numbers:**
 - ards
 - hypertriglyceridemia
- + add a clinical feature**
- get checklist** (button)
- clear search** (link)
- Isabel is not meant to replace your clinical judgment.

possible diagnoses panel:

- show 10** (selected) **show all** **don't miss**
- | Diagnosis | Icons | System | Check |
|--------------------------------------|-------|-------------|--------------------------|
| ARDS | | ? RESP | <input type="checkbox"/> |
| + Neuroacanthocytosis | | ? NEURO | <input type="checkbox"/> |
| TTP | | ? HEMAT | <input type="checkbox"/> |
| + Hemophagocytic Lymphohistiocytosis | | ? NEOPL | <input type="checkbox"/> |
| Familial Chylomicronemia Syndrome | | ? METAB | <input type="checkbox"/> |
| Herpes Simplex Virus Infection | | ? INFECTION | <input type="checkbox"/> |
| Influenza | | ? INFECTION | <input type="checkbox"/> |
| + Liver Neoplasms | | ? NEOPL | <input type="checkbox"/> |
| Pulmonary Tuberculosis | | ? RESP | <input type="checkbox"/> |
| Blast Injury | | ? TRAUMA | <input type="checkbox"/> |
- view all** (link)
- Update EMR** (button)
- Click diagnosis for evidence-based content.**
- feedback:** **submit** (button)

Conclusion

In an era where medical information is readily available to residents, providing them with trusted resources that can positively affect their ability to construct critical pieces like a differential is paramount. Isabel can impact both the quality and timeliness of differential diagnosis generation in clinical learners.

To find out how to bring Isabel to your health organization, connect with us at don.bauman@isabelhealthcare.com or 734.276.1322

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ISABEL SUCCESS STORY

MACNEAL HOSPITAL

MacNeal Hospital has been using the Isabel diagnosis checklist tool since 2008 with their 500 clinician users. As a 427-bed fully accredited teaching hospital, MacNeal Hospital serves the healthcare needs of more than one million people in suburbs of Chicago, Illinois.

WHY MACNEAL HOSPITAL CHOSE ISABEL HEALTHCARE

The MacNeal Hospital clinicians and Dr. Charles Bareis first discovered the Isabel Healthcare diagnosis checklist tool when their physician book club read the book "How Doctors Think" by Jerome Groopman, MD. Reading and discussing the book caused the group of doctors to think about what they could do differently with patients to improve care.

Misdiagnosis is not a typical topic discussed among physicians, and as Dr. Bareis noted, "Doctors do not make a practice of talking about the diagnoses they missed." However, in this group, they began to talk about it, and they came to a common understanding that they needed a level of humility to improve care quality and possibly make some breakthrough improvements for their patients.

INITIAL MACNEAL HOSPITAL CHALLENGES

MacNeal Hospital sought a solution for diagnosis that would be electronically-based, innovative and with a high reliability. With the goal of moving away from print-based research, the MacNeal team wanted their teaching hospital to have the best and most innovative resources to teach their new doctors and they wanted those tools to permeate the hospital.

When they had begun using Isabel, Dr. Bareis was responsible for MacNeal Hospital's Library Services department. The team aimed to migrate to electronic research materials, and Isabel was the computer-based diagnosis tool they chose for their physicians. Before installing the Isabel tool, the staff relied partially on The Internet/Google or electronic clinical resources for their diagnosis and medical research.

The doctors had frank discussion among themselves regarding cases they were involved in which had missed or delayed diagnosis, and they felt it was advantageous to use Isabel for diagnosis throughout the hospital. No other tools were considered to have the capabilities of Isabel, so they decided to implement Isabel for all 500 physicians.



Dr. Bareis noted that their physicians and staff need Isabel, “primarily because no one can keep all the information in their heads.” Relying on Isabel for the most current diagnoses and clinical information has strengthened their clinical care, giving reassurance to physician, patients and their families.

MACNEAL HOSPITAL PATIENT CASE EXAMPLE

An older retired attorney presented with weight loss, hypotension, and persistent hypothermia. His thyroid and adrenal function were normal. The patient seemed to have a case of the “dwindles.” The MacNeal physician consulted Isabel for diagnostic assistance. Neuromuscular disease appeared on the Isabel checklist as a possible diagnosis.

The patient had been previously diagnosed with hereditary proximal myopathy. When the physician researched hereditary proximal myopathy, he discovered that a patient could become hypothermic. This symptom is rare, and in fact, a neurology consultant missed this point; however the physician was able to determine the cause.

The final outcome was that nothing could be done to help this patient in the end stages of his life; however, the physician reported that reaching the correct diagnosis gave the patient’s family great relief to understand the condition so they could treat the symptoms and not worry about other causes.

BENEFITS OF ISABEL AT MACNEAL HOSPITAL

Training New Staff: Isabel helps MacNeal Hospital train its new staff, as they use the Isabel diagnosis checklist to guide new residents and mentor new physicians on their rounds.

Reassurance: Many of the 500 physicians actively use Isabel during their patient consults, and they note that Isabel is an instrumental tool that helps reassure the physician as well as the patient and patient’s family of the diagnosis they reached.

Validation Against Malpractice: Located in Cook County, MacNeal Hospital is in the midst of a misdiagnosis litigation “hot spot.” The MacNeal team finds Isabel helpful from a validation perspective for their patient cases, and physicians often print the results from Isabel to place in patient records.

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Rosalind Franklin University
Medical Student Improves
Diagnosis Skills with Isabel



**"Isabel helps our
students actively pull out
the clinical information
to make better decisions."**

Jim Carlson, RFUMS

ISABEL SUCCESS STORY

Rosalind Franklin University of Medicine and Science

Rosalind Franklin University of Medicine and Science (RFUMS) in North Chicago, Illinois is a national leader in inter-professional medical and healthcare education. The Chicago Medical School at RFUMS offers a doctor of medicine, graduating 190 students each year has used Isabel Healthcare's diagnosis decision support tool "Isabel" as part of its medical curriculum since 2007.

Faculty noticed that students frequently tend to use familiar, though potentially less credible clinical resources such as Google or Wikipedia to inform their learning and clinical decisions. As a result of these observations, the administration decided to look for a tool that could be used to provide trustworthy, and accurate medical information as well as lend support to their curriculum in safety, prevention and professionalism. RFUMS has found Isabel to be a helpful addition to their curriculum and training.

DIAGNOSIS CHALLENGES

Developing student clinical reasoning skill is an essential component of medical training. Since electronic informatics tools are regularly used to help physician's refine their diagnostic accuracy in clinical settings, RFUMS sought to find a tool to help their students learn the diagnostic reasoning process, refine their diagnostic accuracy, and learn about the causes of diagnostic error, including premature closure. Due to their relative inexperience, students are more prone to premature closure, a phenomenon where a physician considers a patient's symptoms to be evidence of one specific diagnosis and then stops considering other reasonable possibilities. While more common in student populations, diagnostic errors occur in practicing professionals and are often the result of a physician not considering other likely options.

SOLUTION WITH ISABEL

RFUMS now includes use of Isabel in various parts of their curriculum, specifically as students learn how to interview a patient develop and initial differential diagnosis. At RFUMS, Isabel is a mandatory component of training for the University's Chicago Medical School students. In addition, all RFUMS students and faculty, including the College of Health Professions and the Dr. William M. Scholl College of Podiatric Medicine, have access to it for the purpose of educational instruction and learning.



According to John Tomkowiak, M.D., M.O.L, Associate Dean for Curriculum and Jim Carlson, MS, PA-C, Director of Interprofessional Simulation at RFUMS, one of the hardest skills to teach medical students is the ability to reason and recognize ones own limitations – it is this skill that differentiates the average clinician from the excellent one.

“Educators have consistently looked for approaches to not only teach this essential skill, but to assess it. With the new Isabel system, we can do both,” he said. Dr. Tomkowiak noted that computer technology is rapidly gaining momentum in hospitals and medical practices around the country. Having students learn and understand its benefits and limitations will allow them to be better prepared to practice when they are on their own, he said.

USING ISABEL IN THE RFUMS CURRICULUM

To evaluate their students, RFUMS measures the impact of using Isabel on the quality of their differential checklist before and after use of the system. Second year medical students use Isabel during the patient interview process in order to help guide them in initial data gathering (history and physical) while the fourth year students use Isabel to improve the quality and accuracy of their differentials after taking a history.

RESULTS

The medical school created and launched its own internal study of the usage of Isabel. RFUMS found in their observations and study that Isabel helps students collect important historical and physical information as well as develop a more accurate list of differential diagnoses. As one student commented, “Isabel gets you thinking about what you are supposed to be thinking about.”

The RFUMS administration believes that Isabel is a valuable education tool for their environment specifically because it provides active versus a passive participation in the learning process. “Isabel helps our students actively pull out the clinical information to make better decisions,” stated Mr. Carlson.

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ISABEL SUCCESS STORY

Lakewood Family Medicine

To support their clinical decisions, physicians and nurse practitioners at Lakewood Family Medicine in Holland, Michigan rely on Isabel Healthcare's diagnosis tool, Isabel, to access evidence-based patient data and potential diagnoses since January 2010.

DIAGNOSTIC CHALLENGES

Prior to using Isabel, the doctors tried other tools including Epocrates and UpToDate to assist with patient diagnosis. They found that Epocrates occupied too much of their system's memory while UpToDate had limitations of only being able to enter one symptom. Subsequently, the doctors lacked access to information from a single reference source and depended heavily on consults to diagnose patients. Turning to Isabel, doctors discovered that Isabel provided the critical information they were missing and have improved their speed in time-to-diagnosis.

SOLUTION WITH ISABEL

Dr. Tim Smith, practitioner with Lakewood Family Medicine, learned about Isabel Healthcare and decided to implement the technology. Isabel has empowered doctors at Lakewood Family Medicine with information to accurately diagnose patients.

Isabel's diagnosis decision support tool has enabled more focused referrals, more appropriately ordered tests and fewer consults. Doctors at Lakewood Family Medicine noticed that there is less need to informally consult colleagues saving time and enhancing the patient experience.



"Isabel provides an avenue to refresh the memory and prompt diagnostic thinking. With one click, Isabel delivers relevant clinical content to educate our doctors and speed the time to diagnosis."

Dr. Tim Smith, Lakewood Family Medicine



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LAKEWOOD FAMILY MEDICINE'S RESULTS WITH ISABEL

Since using Isabel in their practice, Lakewood Family Medicine physicians successfully diagnosed numerous patients with the help of the Isabel tool. Two cases proved to be particularly challenging for the doctors to diagnose – and with Isabel, they found the right diagnosis and profoundly impacted the lives of two patients.

Patient Case #1: A 40 year old female from Michigan had with a four year history of myalgia, paresthesia, fever and fatigue. After her examination, consults were made to both infectious disease and rheumatology, and the results were inconclusive. The patient's lab results did not indicate Lyme's disease, so doctors had previously ruled out this diagnosis. Upon entering her symptoms into the Isabel diagnosis system, Lyme's disease came up high on the differential result list. Doctors re-examined her using an alternate test and subsequently diagnosed her with Lyme's disease. The patient is now receiving appropriate care from a specialist in New York to treat her condition.

Patient Case #2: A 14 year old male with a four year history of recurring fever and persistent joint pain sought treatment at Lakewood Family Medicine. His severe pain limited his ability to engage in physical activity. An initial diagnosis of Ankylosing Spondylitis was made, and he was referred to a rheumatologist. Because he was misdiagnosed that treatment plan failed, and he was referred back to his practitioner at Lakewood Family Medicine. The physician entered the symptoms and demographics into Isabel which indicated that Lyme's disease was a likely diagnosis. With that information, the doctors ordered lab tests and were soon able to make a correct diagnosis of Lyme's Disease. The patient began and responded well during a four-week treatment plan – a significant improvement over the four-year battle of symptoms. The patient was now able to ride his bike for six miles and spend an hour on batting practice – which are activities he could not do over the last four years.

ABOUT LAKEWOOD FAMILY MEDICINE

Based in Holland, Michigan, Lakewood Family Medicine is a family medicine practice and board certified by the American Board of Family Practice. Affiliated with Holland Hospital, there are 11 physicians and five nurse practitioners on staff who see approximately 250 patients each day.

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