

# Quality Improvement Program to Assure the Delivery of Pathology Test Results: A Systemic Intervention in a Large General Hospital

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*A late or missed notification of pathology results could be disastrous for the patient as well as for the medical staff and the institution involved. In this article, the authors describe a systemic intervention implemented and led by nurses to enhance the safety and the efficiency of the notification process. The two-fold intervention includes patient and medical staff education along with developing and implementing a computerized alert system throughout the hospital by a multidisciplinary team. The measurable outcomes were the rate of patient notification and the percentage of physicians reading the pathologist's report through the computerized system. These two outcomes improved significantly after the intervention. This study demonstrates how nurses can play a major role in both patient and staff education and with performing organizational change to strengthen patient safety.*

concern, this improvement process was the initiative of the nurse in charge. An organizational improvement process, led by nurses in a multidisciplinary team, is presented.

According to the Israeli Patients' Rights Act (The Society for Patients' Rights in Israel, 2005), patients have the right to receive all the details relating to their diagnosis within a reasonable time. The Israeli "Testing Tissue or Cell Samples" regulations (Israeli Ministry of Health, 1999) stipulate that the responsibility for delivering and explaining test results rests with the physician. There is very little discussion in the literature about the pathology test results followup process, but the need for a structured process is well recognized (Alexander, Wright, & Thiebaud, 2001; Boohaker, Ward, Uman, & McCarthy, 1996; Hobbs, Jotani, & Valdes, 1997; Keyes, 2000; Ridgeway et al., 2000; Santoro, Blanck, & Smithline, 2001). A recent study looked at how often physicians are unaware of actionable test results of patients after discharge. The study revealed that the surveyed physicians were unaware of almost two-thirds of the potentially actionable test results. The authors concluded that a better designed followup system for test results return is needed to notify physicians as well as patients (Roy et al., 2005).

**A** late or missed pathology test notification could be disastrous for the patient as well as for the medical staff and the institution involved. Ensuring that patients receive the results of pathology tests and return for needed care is a considerable challenge in health care services (Ridgeway, Ginn, Harvill, Hubbs, & Massengil, 2000), especially if the process is not structured or well defined.

In our hospital, the head nurse of the dermatology clinic led a significant organizational change in the

safety standards of patient notification of pathology results. While participating in our nursing quality improvement forum, the head nurse revealed her fear that there may be a chance that patients in the dermatology clinic might not receive their pathology results. Her fears were based on the reality that there was no structured system for assuring the delivery of pathology results to physicians and patients in our hospital. Although the responsibility of delivering the pathology results to patients is considered the physician's primary

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## The Problem

The process of patient notification of pathology results mandates seeing the patient again along with the actual results, to avoid possible misdiagnosis and unnecessary distress to the patient and his family. In our dermatology clinic, patients were instructed to obtain the pathology result from the physician. Due to a lack of a structured and agreed upon method to ensure the delivery of pathology test results, patients were calling the clinic, asking for test results from whomever answered the phone.

A multidisciplinary team was set up, initiated by the head nurse in the dermatology clinic. The team included dermatologists, a pathologist, nurses, the institutional quality team, and representatives from the information systems division. The team's activity led to the development and implementation of institution-wide actions designed to promote the assurance that patients would receive pathology results from their physicians. At the same time, localized improvements in the outpatient clinic helped to increase the awareness of both staff and patients on this subject. The activity of the team, the solutions implemented, and their impact are described.

## Methods

The project was conducted in three stages, with pre and post-intervention surveys approved by the institution's Helsinki Committee. A telephone survey was performed to check the proportion of patients who received pathology results, or inquired about the results in the dermatology clinic. A detailed examination of the reasons why patients did not receive their results was carried out. A registry was established for all patients who had undergone a biopsy at the dermatology clinic during the period of October to December 2001. A total of 186 patients underwent a biopsy at the dermatology clinic during the relevant 3 months.

Contact was made with 101 patients (54%) by phone only. Of these, 80 patients (81%) agreed to answer the questions. It is worth mentioning that during the study period it was not

**Institutional intervention focused at increasing the physicians' awareness and accountability in this process.**

common to use cellular phone numbers to contact patients. That could improve the ability to make contact with patients.

The baseline rate for receiving pathology results through notification by clinic staff or by patients inquiring was 90%. The remaining 10% (8/80) had not received their results. In five cases, the results were normal. In the other three cases, there was significant pathology, such as melanoma. This confirmed the head nurse's suspicions that patients may not be receiving their pathology test results. Even one patient, for example, who is not informed of a result which confirms significant pathology is unacceptable.

There were various reasons why patients did not inquire about their pathology results. Some patients thought the clinic would contact them if the results were abnormal, while others did not know how to obtain results. Other reasons were forgetfulness and lack of importance attributed to the results. The survey confirmed that in the current situation, in which there is a lack of structured system to notify and ensure physicians' readings, patients with significant pathology may not get the results of their tests. In this situation, physicians might not fulfill their professional commitments to their patients.

## Intervention

Based on the findings of the initial survey, a team was formed to find ways of improving the process of

providing patients with pathology results. The strategies included increasing medical staff awareness to the possibility of missing a meaningful pathology result as well as the legal, ethical, and health implications. Another aspect was to promote the staff awareness to patient's involvement in the process.

Changes at the local departmental level included presenting survey results at a staff meeting of the department physicians. A departmental standard was formulated, by which all patients who undergo a biopsy would receive the pathology results within 3 weeks post procedure.

Post biopsy procedure, the patient received a full explanation from the nurse regarding where, how, and from whom pathology results should be obtained. This was accepted by the appointed physician. As the patient left the clinic, a followup appointment was scheduled for 3 weeks. The patient was also given a leaflet with detailed explanation on how and when to get the pathology test results with emphasis on the criticalness of getting the answer in time. These actions were aimed to encourage patients to take greater responsibility for their own care. The patients were instructed to schedule an appointment with their physicians to receive the pathology results before they leave the clinic. It was clarified to the patients that pathology results cannot be given by phone.

Institutional intervention focused at increasing the physicians' awareness and accountability in this process. The organizational changes included the development of a computerized system to support the delivery of pathology results throughout the entire hospital clinical wards regarding all kinds of pathology results. Both Hadassah hospitals introduced a computerized alert system to notify physicians about pathology results. The system

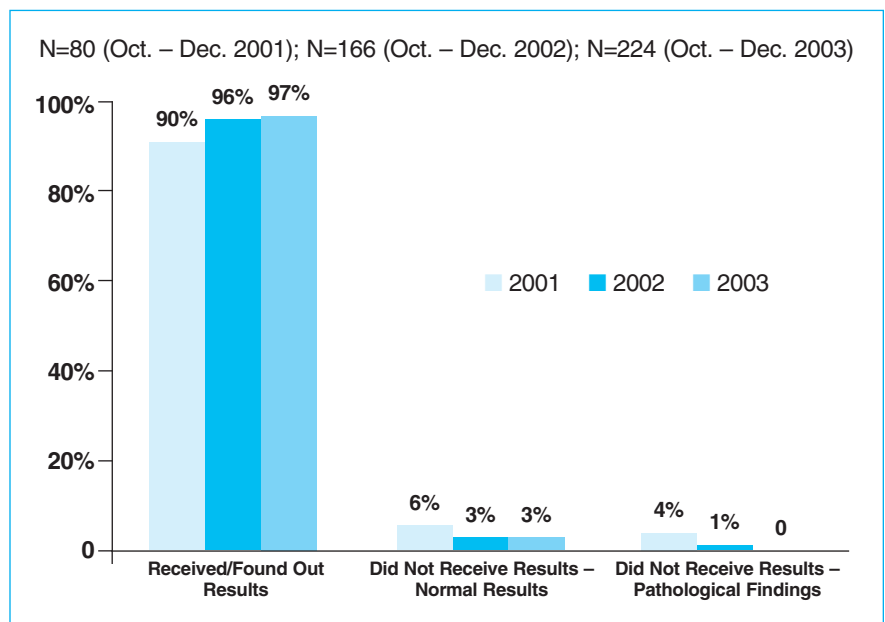
enables physicians to receive all test results in a list by patient or a list of all replies by the clinical wards and clinics sent to the hospital administration. Using this system made it possible to determine the period for which the information is requested. In the new system there is a computerized verification that allows physicians to read the test results. A hierarchical control process assures that if any of the results are not read within 2 weeks by the physician who ordered the test, the department medical manager will be notified via the system. After the notification, the physician has the obligation to assure that the right actions for patient safety will be taken. In addition, the hospital medical director receives reports showing the percentage of pathology results read every half a year. This report reflects percentage of pathology test results read at both hospital clinical wards (from all clinical areas) and physician levels. This provides the medical administration with an effective managerial tool at each level. A followup of the percentage of pathology results read by physicians during the 2 years of the computerized alert system implementation was done. The followup data pointed at several clinical wards in which the implementation of the new processes was poor. It could also identify which physicians had a poor compliance with the new processes.

A new pathology test form was designed which stressed the physician's legal responsibility. This new form contained the details of the physician who referred the patient and the contact details of the patient's primary physician in order to notify him as needed.

## Results

*The samples.* In 2002, after the new procedures were implemented, a second survey was performed and included a total of 207 patients who underwent skin biopsy. Of these, 166 patients (80%) agreed to answer the questions and four refused (2%). We were unable to contact 37 (18%) patients. The percentage of results

**Figure 1.**  
**Breakdown by How Patients Received Test Results**



with significant pathology in the total population was 9%. Eighteen percent of the patients (37 of 207) who could not be contacted had no significant pathology.

In 2003, 250 patients underwent biopsy in the dermatology clinic during the 3 months surveyed. Contact was made with 226 (90%). Of these, 224 patients (89%) agreed to answer the questions, 2 refused (1%), and 24 (10%) could not be contacted. Of the patients who could not be contacted, 10% (2) had no significant pathology. Out of 250 tests, 8% had significant pathology.

*Patient receipt of pathology test results.* The proportion of patients who received pathology results in 2002 improved to 96% (159/166) compared to 90% (72/80) in the initial survey in 2001. This improvement in the rate of receipt of the pathology results continued the following year to 97% (217/224). During this phase, the physicians began using the computer program to read results. In the 2002 survey, which included 166 participants, 4% (7) of the patients did not receive their results. The reasons the patients didn't receive their pathology test results were: (a) the physicians did not contact the patients

regarding the results; and (b) patients didn't ask for the results on their initiative because of the following reasons:

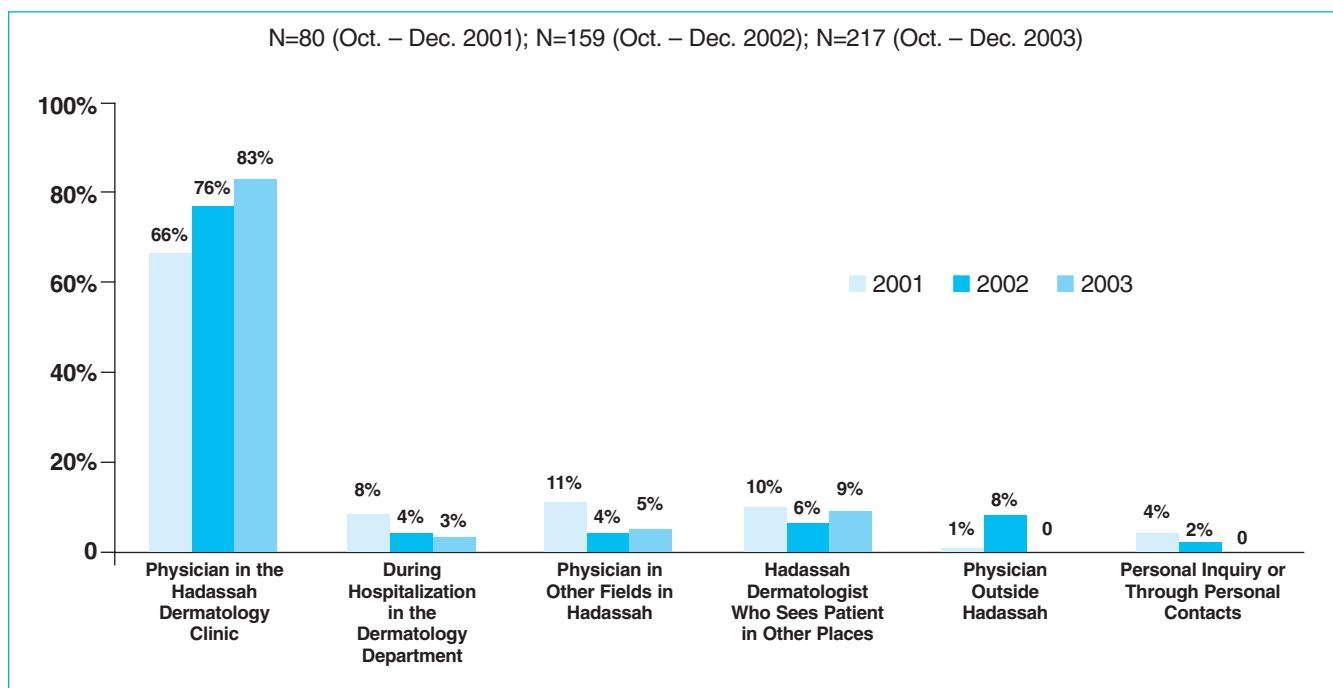
**2002** (7 patients/4%) Six patients didn't have the time to ask for their test results, and one said he thought it was not important.

**2003** (7 patients/3%) In three cases, patients said the physicians told them that there was no need to return to obtain their results. One said the physician didn't instruct her to return. Another patient said she takes care of herself, one said he didn't have time, and one said he was waiting for the answer to arrive by mail.

In 3% (5), the results were normal and 1% (2) had a diagnosis of significant pathology. In the 2003 survey, which included 224 participants, out of the 3% (7) of the patients who did not receive their results, none had a diagnosis of significant pathology.

The results reflect an improvement in the proportion of patients who received their pathology results during the 3 years. There was also a significant decrease in the proportion of patients who did not

**Figure 2.**  
**Breakdown by Source of Pathology Reply to Patients**



receive their pathology results where there was a diagnosis of significant pathology. The improvement is statistically significant ( $p < 0.05$ ). These changes can be seen in Figure 1.

The rise in the number of people sampled observed in the last two surveys can be explained by a consistent increase in the clinic activity these years and can also be linked to the improvement contacting patients by cellular phones. Contact through phone in the first audit was not full, because it was difficult to reach the people at home. It improved considerably later due to the increased use of cellular phones (which was uncommon in the first audit).

In addition, Figure 2 shows the increase in the percentage of patients who directly contacted the Hadassah dermatology clinic services to obtain their pathology test results. This was accompanied by a decrease in the percentage of patients who obtained their results through personal relationship with the medical staff by what is referred as “corridor consultations” (Pullen, Lonie, Lyle, Cam, & Dougherty, 1995)

or “hallway medicine” (Peleg, Peleg, Porath, & Horowitz, 1999). This improvement is statistically significant ( $p < 0.01$ ).

*The reasons why patients failed to inquire their pathology test results.* Various reasons emerged in both surveys as to why patients did not inquire about their pathology test results. Some reasons reflect the patients’ misconception of their own responsibility for receiving the results, while others relate to poor communication. For example, some patients responded that the physician said that there was no need for a further visit. Other patients thought that the reply would be sent to them, and one patient said she was not told to return for a followup visit. Another patient noted that “Her health problem is over and therefore the result is irrelevant.” Finally, some patients simply claimed to “have no time” to inquire about their pathology test results.

*Physicians reading rate of pathology test results.* The computerized alert system has been in place for 2 years. Since implementing the institutional intervention, there are certain distinct changes in the physicians’

approach to their patients’ pathology results. Each physician logging on to the computer with a personal code automatically receives a screen showing all of the pathology results he/she has ordered. In this way, the physician can decide whether to contact the patients who didn’t come for their followup, or determine that the result does not warrant any further intervention.

Since implementation, the percentage of physicians reading pathology results within 14 and 28 days reached 65% and 69%, respectively. The remaining pathology results are read by the physicians through other traditional channels (for example, physicians reading results retrieved by nurses or medical secretaries). This is still a weak point in the process and reflects the need for continuous assimilation of the new computerized system among the physician population. The intervention in the case of this dermatology clinic supports the idea that as more of the new process is implemented, the more patients will be notified about significant pathology.

## Discussion

The literature reveals common administrative and organizational factors disrupting the process of results delivery. Among these factors are turnover and rotation of physicians, lack of formal channels of communication between the pathology laboratory and the physicians, faulty or absent documentation by physicians of tests ordered, and difficulty reaching patients (Alexander et al., 2001; Boohaker et al., 1996; Dwyer, 2002; Hobbs et al., 1997). These factors indicated the need for the general and local interventions.

The computer alerting system enhanced the followup of pathology results, as demonstrated by the rise in percentage of patient notifications. Others have described computerized alert systems of laboratory results in settings such as emergency departments (Greenes, Fleisher & Kohane, 2000) or for either hospitalized or ambulatory patients (Iordache, Orso, & Zelingher, 2001). While the benefits (as patient notification and proper treatment) in predicting and controlling epidemic outbreaks in hospital were clearly outlined (Wright et al., 2004), none were mentioned in the area of outcomes of biopsies in dermatology. The risk of missing potential malignancies cannot be overlooked, therefore presenting time limitation to the process. A computer alerting system helps the physician regain control on the overall pathology test sent by him/her. In this way, he/she can identify in time a pathological result and act accordingly to prevent patient harm.

Convincing physicians to use the computerized alert system was an essential step. According to the theory of diffusion of innovations, 80% adoption may be close to optimum. The "laggards" may adopt later or never adopt the innovation. Individuals are more likely to adopt an innovation if they think it can help them (Berwick, 2003). Before the intervention, the nursing staff used their personal computer code to enter specific test results and present it to the pertinent physician. In this way the responsibility to get

the pathology test results shifted sometimes from physicians to nurses. In implementing the intervention, physicians were required to change their habitual patterns and take full responsibility of all their pathology tests and read the pathology results in a direct and complete way.

The need to properly educate the patients undergoing a biopsy was also addressed in the process. Teaching patients to take responsibility for their own health is a key factor in the delivery of pathology test results. Patients must be thoroughly encouraged to initiate and to inquire about their test results. Greater patient involvement means a lower risk of delaying or missing this critical information (Henderson, 2003). Looking into the patients' source of reply, we found a positive trend in the percentage of patients accepting their results from the initial dermatologist in the clinic. These results reflect an improvement of both the physicians' customs and the patients' care-seeking behavior.

In the future, we plan to upgrade the computer program which will enable the physicians to verify that their patients returned to the clinic after undergoing the biopsy. We believe that taking action to maintain a high level of awareness among the medical staff is a necessary step.

In summary, this article reflects an effort carried out by nurses who led a multidisciplinary team to establish the safety system for delivering pathology test results. ■

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