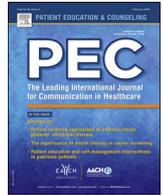




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Short communication

# “We’ll call you when the results are in”: Preferences for how medical test results are delivered

Michael D. Dooley, Shay Burreal, Kate Sweeny\*

Department of Psychology, University of California, Riverside, Riverside, CA, USA

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### ABSTRACT

**Objective:** Whether healthy or sick, adults undergo frequent medical testing; however, no guidelines currently exist as to how patients are informed of their medical test results. This short report provides an initial look at how healthcare professionals deliver medical test results and patient preferences regarding these procedures.

**Methods:** We specifically focus on two options for delivery of results: (1) *open-ended timing*, in which patients are contacted without warning when test results become available; or (2) *closed-ended timing*, in which patients are provided with a specific day and time when they will learn their test results. Participants who underwent a recent medical test indicated which delivery method their healthcare professional provided and their preferred method.

**Results:** Findings demonstrate a large discrepancy between actual and preferred timing, stemming from a general trend towards providing open-ended timing, whereas patient preferences were evenly split between the two options.

**Conclusion:** This study provides a first step in understanding the merits of two options for delivering medical test results to patients and suggests an opportunity to improve patient care.

**Practice implications:** The findings from this study provide first steps toward the development of guidelines for delivering test results in ways that maximize the quality of patient care.

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## 1. Introduction

Adults undergo frequent medical testing. A 2012 study found that patients undergo approximately one imaging procedure per year on average [1], and adults over 50 years of age who are adherent to recommendations undergo regular cancer screenings. Further tests may be required to follow up abnormal screening results, diagnose illness, or monitor chronic conditions. Leaving aside concerns about over-testing and rising costs of care, many medical tests carry with them a secondary risk to patients: distress that accompanies the wait for results. The present study examines one feature of healthcare, the procedure by which test results are delivered, that may influence the extent to which patients experience distress as they await the results of medical tests.

Many patients report that the uncertainty and fear inherent to diagnostic procedures are more distressing than the diagnosis itself [2–4], and studies have documented high levels of anxiety and depression during the wait for biopsy results [2,5–7]. Studies of distress during the wait for genetic tests and in vitro fertilization

results have similarly concluded that this uncertainty is highly distressing for many patients [8–10]. Although little work to date has examined distress associated with more routine tests, the internet has rushed to fill this empirical gap with websites, blog posts, and message boards devoted to helping those who are suffering while awaiting test results [11–14] (e.g., [11–14]). Thus, considerable empirical and anecdotal evidence points to the delivery of medical test results as a window of opportunity in which to improve patient care.

Currently, no formal policies exist in the United States (or to our knowledge, any other country) as to how patients should be informed of their medical test results, aside from privacy protections [15,16]. Of concern to this study are two broad options for the delivery of results: (1) *open-ended timing*, in which patients are contacted without warning when test results become available and the clinician’s time allows; or (2) *closed-ended timing*, in which patients are provided with a specific day and time when they will learn their test results. These options differ in two key ways. First, patients are likely to receive their test results sooner on average when physicians use open-ended timing because closed-ended timing requires that the “appointment” for test result delivery (whether in person, on the phone, or online) be scheduled at a time

\* Corresponding author at: 900 University Ave Riverside, CA 92521, USA.  
E-mail address: [ksweeny@ucr.edu](mailto:ksweeny@ucr.edu) (K. Sweeny).

when the clinician is reasonably certain that the results will be ready. Of course, open-ended timing carries with it the risk that clinicians will forget to follow up, but open-ended timing is likely to be shorter in duration assuming a reasonable standard of patient care. Patient narratives confirm a desire to learn test results as quickly as possible [2,17].

Second, closed-ended timing allows patients to prepare themselves for the event of learning their test results. Considerable evidence shows that pessimistic thoughts spike just prior to receiving personally-relevant feedback [18,19], and this process of “bracing for the worst” provides an effective buffer from the blow of bad news [20,21]. However, timing these efforts appropriately is crucial because extended periods of pessimism are detrimental for well-being [21,22]. Knowledge about the duration of a wait also reduces stress during the wait [23]. Put simply, closed-ended timing removes one source of uncertainty from an otherwise distressingly uncertain healthcare experience.

Currently, we know of no research specifically examining these contrasting approaches to delivering medical test results. The first step towards understanding the merits of communicating open-versus closed-ended timing is to examine patient preferences. Patients who are more satisfied with the care they receive are more likely to adhere to treatment recommendations (e.g., [24,25]), and patients are more likely to adhere to the recommendations of clinicians who communicate effectively with them [26]. Non-adherence has significant negative consequences, including higher health costs, poorer health, secondary illnesses, and more frequent hospitalizations and emergency department visits [27]. Furthermore, distress resulting from suboptimal communication likely has direct health implications via the impact of stress on cardiovascular function, sleep, and inflammatory processes. Therefore, the current study provides an initial look at how healthcare professionals deliver medical test results and patient preferences regarding these procedures.

## 2. Method

### 2.1. Participants

Participants ( $N=180$ ) were recruited and paid \$1.00 for participation using Amazon’s Mechanical Turk (mTurk) site, which connects researchers with willing participants for online surveys. MTurk samples have been found to be comparably reliable to samples acquired from other sources [28]. MTurk workers were eligible to participate if they were currently awaiting the result from a recent medical test. Participants completed several screening items prior to completing the questionnaire to ensure eligibility. See Table 1 for sample characteristics.

### 2.2. Measures

After reporting the type of medical test result they were awaiting (Table 1), participants responded to the following prompt: “Think back to the day you underwent the medical test. Which of the following best describes the information you received regarding when you would learn the results of the test?” Participants then indicated whether the information indicated *open-ended timing* (the doctor or nurse would contact them when the results were available, but no specific time was indicated) or *closed-ended* (the doctor or nurse indicated a specific day and/or time when they would receive their results). Next participants indicated which of those options would have been their preference, had they been given a choice. Finally, we assessed the nature of the medical test with the following prompt:

Thinking ahead to your test results, you might learn one of two things: either everything is fine, or something requires treatment

**Table 1**  
Sample characteristics.

Demographic variable	( $n = 180$ )
% female	64%
Mean age	35.17
Education	
Did not complete high school	2%
Completed high school only	37%
Completed college	62%
Race/ethnicity	
White/Caucasian	79%
Asian	7%
Black/African-American	6%
Hispanic/Latino	4%
Other/unknown	6%
Type of medical test	
Scan (MRI, CT, ultrasound, X-ray)	28%
Blood work	14%
Mammogram	12%
Biopsy	6%
Genetic test	3%
Other	7%

or follow-up testing. Considering these two possibilities, how likely do you think it is that your test will show that everything is fine (nothing requires treatment or follow-up)? Please indicate the likelihood on a scale from 0% (*something is definitely wrong*) to 100% (*everything is definitely fine*).

## 3. Results

The vast majority of healthcare professionals used open-ended timing (93%), with only 12 participants receiving specific information about when they would receive results (Table 2). In contrast, participants were evenly split in their preferences: 50% preferred closed-ended and 50% open-ended timing. Comparing participants’ preferences to their experience, only 55% of participants would be receiving their test results in the way they preferred.

We conducted logistic regression analyses to determine whether the nature of the medical test predicted how patients would be receiving their test results or their preferences. In fact, patients who estimated a greater chance of a problematic test result (suggesting that the test was not simply routine) were more likely to get their results with closed-ended timing,  $\beta = 0.02$ ,  $p = 0.04$ . However, participants’ timing preferences did not vary depending on the nature of the test,  $\beta < 0.001$ ,  $p = 0.99$ .

## 4. Discussion and conclusion

### 4.1. Discussion

The goal of this study was to provide an initial look at how healthcare professionals deliver medical test results and patient preferences regarding these procedures. Our findings indicate that

**Table 2**  
Frequency of closed-ended vs. open-ended timing experiences and preferences.

Experience	Preference		Total
	Open-Ended	Closed-Ended	
Open-ended	85	77	162
Closed-ended	2	10	12
Total	87	87	

healthcare professionals rarely provide a clear timeframe for when patients can expect to receive their results. In contrast, half of the patients surveyed wanted to know exactly when they could expect to learn their results. Further, less than half of participants received results in the way they desired.

Although this study did not investigate patients' rationale for these preferences, these methods of delivery differ in distinct ways. The possibility of getting results as soon as they are available, rather than waiting for a scheduled appointment, may be particularly enticing to some patients. On the other hand, a specific timeline may allow patients to focus their attention on other matters as they await results. Further research is needed to explore predictors of patients' preferences, which could be targeted to tailor delivery methods appropriately.

Additionally, little is known about how healthcare professionals determine the procedure by which they will deliver test results. This study provides preliminary evidence that they are particularly likely to use open-ended timing for more routine tests, yet patients were equally likely to prefer closed-ended timing regardless of whether the test was routine. Regardless of the cause, the discrepancy between healthcare professionals' behavior and patients' preferences reveals an opportunity to improve patient care.

#### 4.2. Conclusion

This study provides a first step in understanding the merits of two options for delivering medical test results to patients. Patients who are dissatisfied with the care they receive often lose trust in their healthcare providers and are less likely to adhere to providers' recommendations (e.g., [24–26]); thus, our findings have the potential to improve the well-being of patients and providers alike.

#### 4.3. Practice implications

A clear next step is to examine these processes as they unfold within a healthcare context. Observational studies can first examine links between patients' preferences, providers' delivery strategies, and patient outcomes. Randomized controlled trials can then provide strong tests of the consequences of open- versus closed-ended timing with broad comparisons between delivery strategies and efforts to tailor delivery of test results to patients' dispositions and preferences. Ultimately, we anticipate that this work will culminate in the development of guidelines for delivering test results in ways that maximize the quality of patient care.

#### Consent

I confirm all patient/personal identifiers have been removed or disguised so the patient/person(s) described are not identifiable and cannot be identified through the details of the story.

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