Opinion Paper

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The view of a general practitioner on immediate access for patients to their laboratory test results

<https://doi.org/10.1515/cclm-2018-0743>

Received July 16, 2018; accepted October 4, 2018; previously published online October 31, 2018

Abstract: This position paper presents the role of laboratory test results in traditional general practice and provides a recommendation for responsible sharing of results with patients for improved safety, efficiency and outcomes. This paper looks at the relationship between the laboratory, the general practitioner consultation, the patient, safety and general practice capacity. We suggest changes in the traditional practice of communicating laboratory test results whereby normal or abnormal results are made available to patients as soon as they become available. We also endorse the opinion that using online tools such as email or text messages could enhance the provision of rapid access to laboratory test results for patients.

Keywords: electronic health records; general practice; laboratory testing; patient access; safety capacity consultations.

Introduction

The General Data Protection Regulation (GDPR) and patient online portals provide individuals with increased rights to access their results and to the portability of their personal data. This allows patients to obtain and reuse their personal data for their own purposes [1]. Patients benefit from immediate access to their medical records

and laboratory test results. Immediate receipt of results and diagnoses can reduce the incidence of errors and accidents of care.

Three key issues in providing responsible access for patients to their results in the general practice (GP) include safety, capacity and consultation, as described below, which are core principles of the P4 (preventive, predictive, personalized and participatory) Health approach.

Safety

The delivery of care by general practitioners (GPs)/family physicians should be safe, effective, timely, patient-centred, equitable and efficient. One of the critical components of high-quality patient care is efficient and accurate clinical laboratory testing as many clinical decisions depend on laboratory test results [2]. It is, therefore, imperative that test results are appropriately and timely communicated not only to medical practitioners but also to patients [2].

Accurate and efficient clinical laboratory testing is a critical component of high quality patient care as laboratory test results influence many medical decisions and consultations, including diagnosis, prognosis, risk and predictive assessment, prevention, screening and the monitoring of treatments and therapies. In addition, aggregate test result data are used for public health surveillance, healthcare performance measurement, and quality improvement [3]. The quality of laboratory testing, therefore, may greatly affect the quality and affordability of patient care and any defects or errors impact on the care of each patient as well as the costs incurred by the healthcare system [4].

However, the laboratory testing process is complex and consists of many steps, beginning with test selection and request, followed by sample collection, transport, processing and analysis, and finally, result reporting and interpretation. We therefore look at the relationship between the laboratory, the GP consultation, the patient, safety and general practice capacity.

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Table 1: Rules for redesigning health care processes.

Rule	Description
1. Care based on continuing healing relationships	Patients should receive care whenever they need it and, in many forms, not just face to face visits. This rule implies that the health care system should be responsive at all times (24 h a day, every day) and that access to care should be provided over the Internet, by telephone, and by other means in addition to face-to-face visits
2. Customisation based on patient needs and values	The system of care should be designed to meet the most common types of needs, but have the capability to respond to individual patient choices and preferences
3. The patient as the source of control	Patients should be given the necessary information and the opportunity to exercise the degree of control they choose over the health care decisions that affect them. The health system should be able to accommodate differences in patient preferences and encourage shared decision-making
4. Shared knowledge and the free flow of information	Patients should have unfettered access to their own medical information and to clinical knowledge. Clinicians and patients should communicate effectively and share information
5. Evidence-based decision making	Patients should receive care based on the best available scientific knowledge. Care should not vary illogically from clinician to clinician or from place to place
6. Safety as a system property	Patients should be safe from injury caused by the care system. Reducing risk and ensuring safety require greater attention to systems that help prevent and mitigate errors
7. The need for transparency	The health care system should make information available to patients and their families that allows them to make informed decisions when selecting a health plan, hospital, or clinical practice, or when choosing among alternative treatments. This should include information describing the system's performance on safety, evidence-based practice and patient satisfaction
8. Anticipation of needs	The health system should anticipate patient needs, rather than simply responding to events
9. Continuous decrease in waste	The health system should not waste resources or patient time
10. Co-operation among clinicians	Clinicians and institutions should actively collaborate and communicate to ensure an appropriate exchange of information and coordination of care

Source: [5].

The report of the International Organization of Medicine (IOM) [5] found that the current system was unable to provide safe, high-quality care in a consistent manner. The report's recommendations consisted of 10 rules (Table 1) to redesign the health system and a series of recommendations.

Private and public health purchasers, health care organisations, clinicians, and patients should work together to redesign health care processes in accordance with the 10 rules suggested by the IOM (Table 1).

However, "there is surprisingly little research on 'safe' levels of working, although there is evidence around doctor fatigue and an increase in errors, litigation or mistakes. Limiting appointment rates, or any other rate limitation method, will require improved triage and care navigation" [6].

Capacity

In the report "Workload Control in General Practice Ensuring Patient Safety Through Demand Management" of the British Medical Association (BMA) [6], the authors state "There is an urgent need for a campaign led by the GPC (General Practitioners Committee), to focus on the

problems caused by the current GP workload within the NHS. This issue affects most practices and is of particular significance to GP partners, although those under employment contracts often report similar problems. It is certainly a factor behind the rise in the number of "independent" or locum GPs, who have chosen to work flexibly and maintain a better work-life balance, rather than take on unmanageable workloads".

The BMA report also states: "Workload has increased through genuine and growing patient needs (complex multi-morbidity) in primary care. The consultation rate in the UK is 2–3 times that of comparable EU populations. Between 2007 and 2014 overall consultation rates for GPs in England rose by 13.6%. Consultations grew by more than 15% between 2010/11 and 2014/15" [6].

"The number of telephone consultations with GPs doubled (99.6% increase), though face-to-face surgery consultations, which rose 6.4%, still accounted for nearly 90% of all consultations. In 2013/14, the rate of increase in the number of face-to-face consultations per patient plateaued" [6].

"There is no longer any slack – GPs and nurses are now consulting throughout the booked clinic without a break and demand for those clinic slots is rising" [7]. Studies on patient access to records demonstrate that

patients use their own records and results to supplement their care, reduce GP workload and increase the number of available clinic slots and GP capacity [2].

Consultations

Consultation is the most important process in the primary care healthcare environment. It is therefore imperative to explain and understand the following issues: What are consultations in English General Practice? How can they be made more effective and safer? How can access to laboratory results help?

In “Clinical thinking and practice: diagnosis and decision in patient care” [8], the authors describe the consultation that comprises eight stages (Table 2).

In ‘The Exceptional Potential in each Primary Care Consultation’ [9], the authors described four areas to be systematically explored each time a patient consults:

- Management of the patient’s presenting problem.
- Modification of help-seeking behaviours (including monitoring of results).
- Management of continuing problems (including management of results).
- Opportunistic health promotion (including discussion of results).

The consultation is described as “‘the central act of medicine’ which ‘deserves to be understood’. It is clearly central to the transaction between doctors and patients and central to the relationship between doctors and patients” [10].

In addition, The Consultation – An Approach to Learning and Teaching [10] describes seven tasks which taken together form comprehensive and coherent aims for any consultation. From observation, seven tasks were detailed which together form comprehensive aims for the consultation (Table 3).

Table 2: Stages of consultation.

Stage	Description
1	History
2	Examination
3	Differential diagnosis
4	Investigations and tests
5	Working diagnosis
6	Communication to the patient (including the meaning of results)
7	Implementation of treatment (including targets for results)
8	Continuing care (including the monitoring of results)

Source: [8].

Fitting disruptive laboratory technology into the GP consultation workflow

The final steps of the consultation

In 1975, on describing the testing process as the “brain-to-brain loop”, George D. Lundberg stressed that what counts is the final step of the cycle: the appropriateness of the action(s) undertaken on the individual patient and based

Table 3: Tasks in the consultation.

Number	Task (and sub-task)
1.	To define the reason for the patient’s attendance, including:
a.	The nature and history of the problems
b.	Their aetiology
c.	The patient’s ideas, concerns and expectations
d.	The effects of the problems
2.	To consider other problems:
a.	Continuing problems
b.	At-risk factors
3.	With the patient, to choose an appropriate action for each problem
4.	To achieve a shared understanding of the problems with the patient
5.	To involve the patient in the management and encourage him/her to accept appropriate responsibility
6.	To use time and resources appropriately:
a.	In the consultation
b.	In the long term
7.	To establish and maintain a relationship with the patient which helps to achieve the other tasks

Source: [10].

Figure 1: Pathways for communicating laboratory test results to patients. GP, general practitioner; Lab, laboratory.

on the laboratory information provided. Lundberg also stated: “unless the appropriate action occurs, it is as if the cycle had never begun and is, at the most, a tragedy and, at the least, a waste” [11].

According to this viewpoint, which is consistent with a patient-centred approach, all steps of the testing cycle should be evaluated and continuously monitored by the patient as well as by the clinician to assure that high-quality laboratory information is provided and that, in turn, an appropriate action is taken for the individual patient.

The process of testing and communicating laboratory test results to patients is complex in primary care in some countries such as the UK [12]. In the process of the traditional practice of clinical laboratory testing and communicating process (Figure 1), patients are invited to the GP in the case of abnormal test results while in the case of normal results the GP usually takes no action, which could leave patients in uncertainty and wonder about their test results. In this regards, empirical evidence shows in the case of normal results 80% of GPs expect the patient to call for their test results and in the case of abnormal results, 40% of GPs also expect patients to inquire about their test results [13].

Failure of test result communication reduces patient safety [14]. Generally, patients do not contact their GP for enquiring about test results except when they are seriously ill [15]. Failing to inform patients of clinically significant

abnormal test results is not uncommon [16]. The practice of ordering tests and of communicating the results of laboratory tests to patients need to fit with a patient-centred approach to medical care in which patients are partners in the decision making [17].

There are several barriers that delay or block communicating clinical test results to patients. Accessing results by telephone can be difficult after daytime hours and at weekends. The process of laboratory test results communication in primary care needs to be improved by integrating test result management tools into patients' electronic health records (EHR) and improving patient engagement in the process [18, 19].

How do patients use their results to augment the consultation and workflow?

Studies show that access to GP records and laboratory test results improves efficiency. Patients use their own data [20] to supplement and complement many stages of the consultation and to improve the safe delivery of care [21]. Online laboratory test result access with informed consent before the test is ordered, and particularly with continuing long-term problems, reduce visits to the GP surgery by

Table 4: Patients' comments on the use of clinical laboratory results.

Accessing GP records for checking laboratory test results:

- "Blood test – EC test – event recorder test."
- "Tests as above and general."
- "I have had various tests over the past 12 months and have been able to access the results to decide on next course of action if necessary."
- "Results have meant review/change to current medication."
- "Able to print off results/reports for consultant without bothering the practice."
- "Consultant reports, consultation notes and lab results."
- "Checks on PSA [prostate-specific antigen] tests (twice yearly)."
- "I was not able to access test results from a minor operation that were on my file, having called the surgery these were printed off for me to collect."
- "Able to clarify the situation by reading online reports."
- "Obtaining results for glucose and cholesterol levels, renal function tests; comparing blood pressure readings."
- "Blood test results. Making appointments checking on other results (consultations, etc)."
- "I can print out my own results."

Patients also use access to the GP record to follow the hospital and consultant care pathways:

- "Saved bother of requesting reports."
- "Able to obtain copies of reports for consultations with hospital doctors."
- "Consultant reports, consultation notes and lab results."
- "Read consultant letters ref hiatus hernia tests."
- "I check to see if the surgery has received copies of H.... Hospital's letters that are sent to me."

For private reports and personal uses:

- "Able to obtain reports for insurance purposes. "
- "Insurance purposes (but the format of some downloaded reports too big and cannot be resized)."
- "Checking my history for insurance questionnaires."
- "Printing out and taking my record away on holiday."
- "I always take my log on and passwords abroad it is useful if I have cause to go to clinics."
- "Checking my medical records for travel insurance purposes."

For Knowledge management for the patient – using notes to make decisions, understand more or refresh memory:

- "Could look up the type of antibiotic prescribed for further Googling."
- "Also referred back to notes about daughter's allergies."
- "Test results showed what medication I would need and that it was on an automatic prescription."
- "Reading the results of a hospital stay and what further investigations/medication was required without having to ask."
- "I looked up some previous treatment information rather than ring up or make an appointment."
- "Able to check any past issues I have had or the medication I am taking or gather what I perceive as important."
- "To check I've understood everything my doctor told me, and check I've not missed anything he said."

Checking the progress of GP care pathways:

- "Checking to see if a letter has been sent or seeing results online so you don't need to phone."
- "Checked on when I had last asthma check. Booked appointment – it was nearly due."
- "I have been able to read and digest and assess the situation and then make a decision whether to call at the practice. Both times I have felt that I didn't do anything else."
- "As sometimes I don't feel that I have all the relevant facts or that the appointment time is not long enough for the doctor to answer all the questions that I might have in full. Or sometimes if I don't know what questions I should ask, I can analyse all the results on my PC [personal computer] without having to bother or waste the doctor's time by visiting the surgery. If necessary then I could make an appointment."

Preparing for consultations:

- "By having results from tests prior to seeing a doctor."
- "I require linking the timing with the nurse for the results and then the doctor, this online method has been most helpful."
- "Another benefit by having access to my records I am informed before attending either the doctor or a specialist's Appointment at the hospital without having to telephone the surgery."
- "To better enable me to understand the cause, make-up and progress of the chronic diseases that I suffer from, and their various medicinal treatments, so that I may be better able to understand and discuss these with my GP at my approx. half-yearly blood/urine tests and review appointment."
- "As an example, by extracting and plotting my MDRD [modification of diet in renal disease] levels, I am able to see that although there is spot variance over the last few years within the band, the trend is not worsening and the CKD [chronic kidney disease] is still acceptably staged 3A. The trend, rather than a spot figure. Maybe an appropriate consideration in determining ongoing medications and I would be able to have an intelligent discussion of this with the GP a better understanding of his view and recommendations in the matter."
- "To discuss results."
- "Getting blood results for hospital appointments."
- "Not having to come in to pick up printed results to take to the hospital."

allowing patients more time to access and to understand their results and how they will impact on their future care. The patient spends less time with health professionals.

Earlier studies show patients' comments on the use of their laboratory results and access to their personal medical records [20]. Selected comments are recorded here to illustrate how patients can facilitate healthcare and care pathways through the use of their results and records (Table 4).

Discussion

The clinician has a vital role in shared decision making. They help patients to understand why tests are being performed to make a diagnosis, rule out certain conditions or screen for conditions that patients may be at greater risk of. This role includes helping patients to understand what their results may mean and the consequences of a positive or negative result. This helps patients not only to determine whether they wish a test is done or not but also to know what to do when after the test is performed. Appropriate information sharing by the clinician may prevent patients from "Googling" for further information that might be incorrect and harmful.

The discussion between the clinician and patient about why the tests should be performed should ideally take place during the consultation and before the test is ordered. Information should be provided to patients and carers that they can refer to at the time of the test. Knowing that the results will be seen by both the patient and the clinician will help the laboratory to support the patient and the clinician. Seeing what the clinician has written about the consultation in the notes alongside the ordering of the test could help patients to understand the results and the urgency with which they should respond to the results. For instance, a seriously abnormal test result may warrant an urgent review whilst a normal test result could be filed with no need for follow-up. Thus, an active partnership between GP, patient and laboratory is critical to the precise and efficient use of the results communicated in real time.

Sharing the same data and information between the patient and clinician is an essential element of "The Partnership of Trust". The clinician helps the patient to understand the data. This is not just about being "patient-centred". Once the partnership and understanding has been created, it is imperative that tests should be done which maintains "The partnership of trust".

Doctors and laboratories should not abdicate their responsibility to help the patient to understand their

results. The clinician cannot assume that the patient will have checked trusted resources such as Lab Tests Online or understood the context in the consultation of grossly abnormal results or those that need their urgent attention. If patients do not understand the results, then they may do a "Google" search or equivalent which could lead them to the wrong conclusions. With understanding, patients will be better prepared when the clinician contacts them for any bad news and in determining next steps if such a responsible attitude and behaviour is encouraged.

We advocate responsible sharing of laboratory results and recognise that this requires more than just ordering the test. The extra time invested in helping patients to understand their test results does add costs but some of this can be recouped later with less patient anxiety, fewer patients needing a consultation on normal results and more time spent by clinicians on further management plans. Health systems might determine the cost for this extra work and practices should not be expected to absorb this cost especially the costs at the start of patient access to results when patients first sign up. The starting procedures are time consuming and reduce the take up and widespread acceptance of direct patient access to results.

Patients in developing countries already have immediate full access to their laboratory results, which they use for various purposes including self-management and seeking a second opinion [22]. However, there is a paternalistic attitude and stance in providing patients access to their medical records including laboratory results in developed countries such as the UK [23] where patients do not have immediate access to their laboratory test results although patient access can now be made available more easily under the GDPR framework [1].

Conclusions

General practitioners (family doctors) need to fully inform patients about the reasons for laboratory tests, the normal and abnormal test results and the possible consequences during the consultation process and prior to ordering for laboratory tests. This practice can help patients in avoiding Googling for information that could be unauthentic and bear a risk of harmful disinformation. In many developed countries such as the UK, patients do not have full access to their medical records including laboratory test results and the practice of informing patients about the latest laboratory test results varies between GPs.

Online access to real-time laboratory results has the potential to improve patient safety and to increase GP

capacity for consultations. Online access to laboratory results is a transformative technology. We propose changes in the traditional practice of communicating laboratory test results whereby normal or abnormal results are made available to patients as soon as the results become available at the laboratory (Figure 1).

The channels through which laboratory test results can be immediately available to patients including patients access to their online laboratory records as well as the communication of test results to patients include online tools such as personal email or mobile phone messaging [24]. These channels may be preferable for many patients when compared to other channels such as a phone call and letters [25].

Online modes of communicating laboratory test results have different advantages to face to face communication, a postal letter and a landline phone call [26]. It can be also noted that some forms of communication of test results – such as written biopsy results – may not be fully understood by some patients who may need clarification and explanation provided by the doctors [27]. However, direct communication of and access to laboratory test results have been shown to reduce the burden of healthcare providers and to reduce the number of missed test results [28, 29].

More importantly, an active collaboration and partnership between patients, doctors and clinical laboratories is needed for the real time communication of laboratory tests results to both patients and doctor. Thus, helping in the correct use of the test results and making the whole process of healthcare much efficient and participatory, which is a core principal of the P4 (preventive, predictive, personalized and participatory) Health approach [30].

Acknowledgments: This paper was presented at the 2nd European Federation of Clinical Chemistry and Laboratory Medicine (EFLM) Strategic Conference held in Mannheim, Germany on 18–19 June 2018. The authors wish to thank to two anonymous reviewers and editor(s) for their comments/suggestions that have helped to improve the manuscript.

Author contributions: All the authors have accepted responsibility for the entire content of this submitted manuscript and approved the submission.

Research funding: None declared.

Employment or leadership: None declared.

Honorarium: None declared.

Competing interests: Authors declare no conflict of interest.

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Article note: Lecture given by Dr. Richard Fitton at the 2nd EFLM Strategic Conference, 18–19 June 2018 in Mannheim (Germany).