

# Who chooses laboratory tests? The physician or the computer?

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Does the convenience of choosing groups of blood tests take precedence over preventing over-diagnosis?

- Increased use of electronic health records (EHRs)
- Primary care physicians' (PCPs) work load increase
- More screening, more quality indices
- And more and more laboratory tests for more and more conditions
- Any practice which saves us time is welcome
- Marking off tests saves having to remember how they are spelled
- Easier to choose by default rather than actively search

- So why not choose convenience?
- Making decisions too easy means more tests
- If not enough thought given, we get over-diagnosis and over-treatment
- Excess costs to the insurer in money, personnel and time
- Inefficient use of resources (especially imaging)
- And of course, costs to the patient of money, time and stress

# Why does it happen?

- Inexperienced or unsure doctors
- Defensive medicine
- Use of protocols/guidelines
- Short patient visits pressure us to make quick decisions and also not to miss anything
- Many doctors don't check previous lab results to see if called for or not (works both ways)

- Patient demands
- Easier to prevent expensive testing rather than deal with inexpensive lab tests - but they add up
- Belief that lab tests are more important than taking history and examining patient (among doctors and patients)

- In Israel EHRs with computerized ordering of lab tests have been in use in health maintenance organizations (HMOs) for over 15 years.
- In the Leumit HMO there are three different ways to find and mark laboratory tests. There is a screen which pops up when the laboratory function is accessed. On this screen there are categories of commonly used laboratory tests such as blood chemistry, endocrinology, serology, urine.

- Secondly, a number of groups such as liver tests, lipid profile, kidney function can be checked off as one. The components of the group can be de-selected but this is not commonly done.
- Third - At the bottom of the screen is a search function which can find any laboratory test done in the HMO by typing the name of the test or part of it.
- Gamma glutamyl transferase (GGT) was available in the "liver tests" group and also in the "general chemistry", as well as via the search feature.

# GGT (gamma glutamyl transferase)

- GGT is not considered a screening test
- Relevant mostly in cases of elevated alkaline phosphatase
- Can be used to identify or follow up alcoholism and its treatment
- More sensitive than transaminases in cholestasis but not in infectious hepatitis; rare that only GGT high and if transaminases not also high, not likely to be serious liver problem

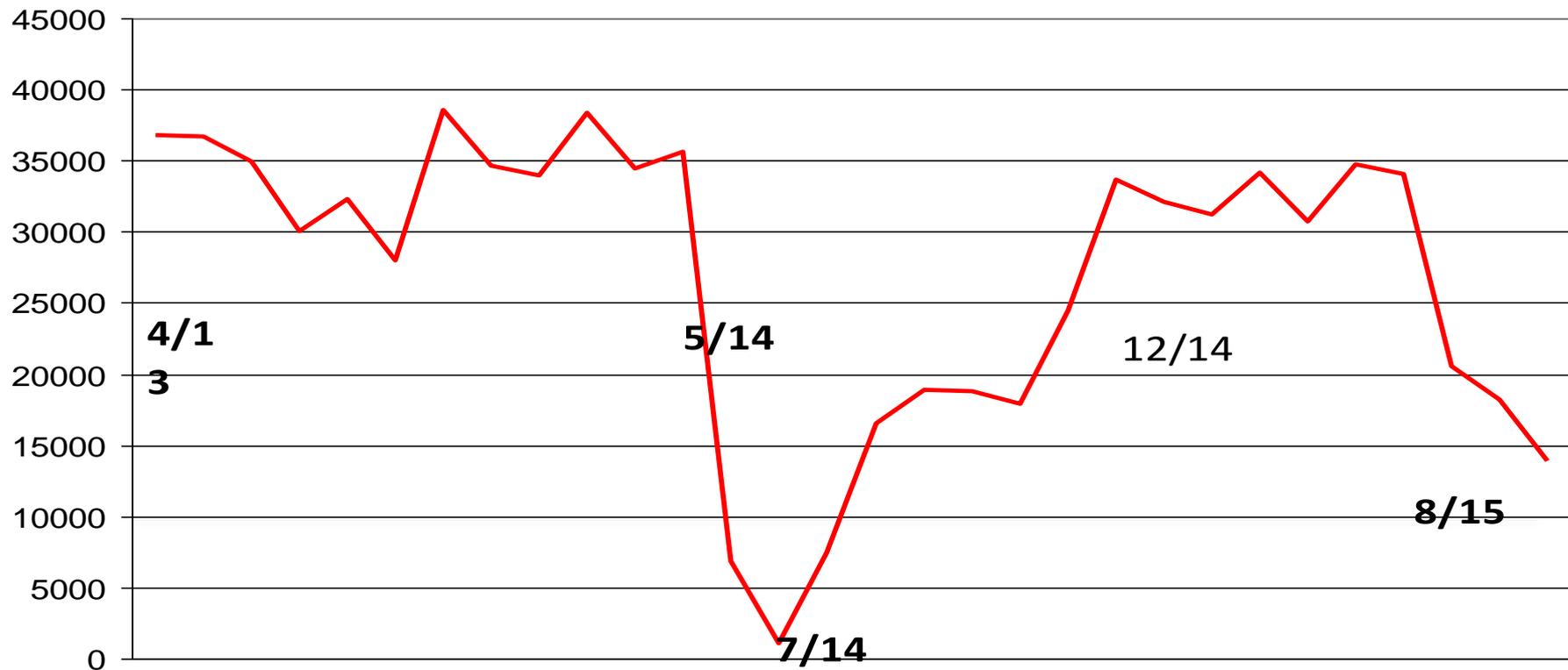
- Many false positives with accompanying danger of over-testing including invasive biopsies
- Over-used by PCPs and usually sent with a bundled set of “liver tests”
- In short – probably useful for consultants but much less so for PCPs
- Many medical societies advocate taking it out of a grouped set of liver tests

# An observational study

- If the test was made less convenient to order would that affect the number of tests ordered?
- Opportunity to do an observational study arose when changes were made in the computerized order forms for GGT
- In April 2014 GGT was removed from the main screen and was only available via the search function
- Two months later it was returned to the main screen, at first partially and 5 months later completely

# Results

- There was a dramatic decrease in orders when GGT could only be ordered by the search function – from 36,000 to 1000 per month (decrease of 97%) .
- When GGT was added back to one place on the main screen the numbers jumped to 18,000 and back to over 35,000 when GGT returned to both places.
- Currently GGT only appears with the “liver tests” and numbers have stayed less than 18,000 a month (decrease of about 50%)



**April 2014**

GGT removed from main screen

**June 2014**

GGT is returned to one place on the main screen

**November 2014**

GGT was returned to both places on the main screen

**July 2015**

Decided that GGT will be available as a grouped test (one place only)

- A slight decrease in convenience led to a dramatic decrease in numbers of tests.
- There have been no reports of diagnoses being missed or delayed due to these changes in the ordering of lab tests. It's still too early to rule out any complications of the change in ordering practices, but there is no evidence in similar cases in the literature.

- Technology is great but each item needs to be carefully tested to avoid over or under-diagnosis and over or under-treatment
- Over the years a recurring theme is how to prevent inexperienced doctors and those who are not sure of themselves from ordering unnecessary tests
- Various solutions have been suggested but not all have shown success

- Efforts in educating physicians in proper use of laboratory tests have been useful only in the short term.
- Monetary or other sanctions have not been helpful and are more likely to create over-testing as a reflex with accompanying notes being not entirely correct
- Other studies have been done on changing computerized order forms in other countries as well as in Israel. These were successful but not as dramatically as in our case.

# Future directions

- We need more years of follow-up to be sure we have not missed diagnoses
- Other lab tests should be studied in more settings – possible candidates include sedimentation rate (ESR), anemia work-ups, serologies for screening asymptomatic patients, and so on
- Education of PCPs is still useful but maybe we need studies on which aspects and which methods are the most successful

# Points for discussion

1. Does saving time take precedence over unnecessary testing?
2. Is autonomy (in deciding which tests to order) negated by being given to choose from a limited number of recommended tests in various medical situations? Or are we actually making the job easier?
3. What do the results of our study say about the decision making process of physicians?