Article:
E. Diamandis.
Conquering Cancer in Our Lifetime: New Diagnostic and Therapeutic Trends
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Guest:
Dr. Eleftherios Diamandis is Division Head of Clinical Biochemistry at Mount Sinai Hospital, Biochemist-in-Chief at University Health Network, Toronto.

Bob Barrett: This is the podcast from *Clinical Chemistry*. I am Bob Barrett.

Cancer has now surpassed cardiovascular diseases as the number one killer of both men and women. Approximately 1 out of 3 of us will develop cancer during our lifetime.

The January 2013 issue of *Clinical Chemistry* is devoted to the area of cancer and cancer diagnostics. Joining us in this podcast is one of the guest editors for this special issue, Dr. Eleftherios Diamandis. He is Division Head of Clinical Biochemistry at Mount Sinai Hospital, Biochemist-in-Chief at University Health Network, Toronto, and also Division Head of Clinical Biochemistry at the Department of Laboratory Medicine and Pathobiology at the University of Toronto.

Tell us Dr. Diamandis, why is *Clinical Chemistry* publishing a special issue on cancer?

Dr. Eleftherios Diamandis. As you know Bob, *Clinical Chemistry* is the leading journal of laboratory medicine and it's highly interested in new diagnostics for all diseases, including cancer of course.

Every year *Clinical Chemistry* is devoting one special issue that is focusing on a single theme. Last year it was cardiovascular disease, this year it's cancer. As you know cancer is becoming the number one killer in both men and women and has also already surpassed cardiovascular disease in overall deaths.

Bob Barrett: What type of papers have you included in the special issue?

Dr. Eleftherios Diamandis. The special issue includes different types of papers, all dealing with cancer.

For example, there are reviews, mini reviews, opinions, perspectives, points and counterpoints, question and answer, reflections, and also original papers dealing with the biology, diagnosis, and therapeutics of cancer.

It is a very rich issue spanning a wide array of interest and we hope that the readers of *Clinical Chemistry* will keep this issue and consult it regularly for many years to come.

In a few words, the special issue represents a snapshot of the current state of the art in diagnostics and therapeutics for cancer.

Bob Barrett: There are those that claim that cancer and mortality have not really changed significantly over the past 15 years despite major investments in the field. Do you agree with that?

Dr. Eleftherios Diamandis: Well, the fact is that since 1990, overall cancer mortality rates have declined significantly in the United States despite the aging of the population.

A good example is lung cancer, where incidents began to decline in the early 1980s due to the anti-smoking campaigns.

Modest decreases in mortality have also been seen for colorectal, breast, prostate cancers, and leukemias. For some of the cancers, the five years survival rates have increased slightly, such as liver and pancreatic cancers.

Bob Barrett: Well then, are we winning or losing the war against cancer?

Dr. Eleftherios Diamandis: Well, for some cancers, such as the hematological cancers, the outcomes of patients have changed dramatically for the better. For many of the solid tumors, the results are very modest.

However, focusing only on median five year survival may not reveal the substantial improvement in survival for subsets of patients treated with newly discovered therapies that target genotypic changes that can be identified by molecular testing. This is the realm of personalized medicine.

We are now realizing that cancer cells have tremendous heterogeneity and we appreciate that single drugs or other modalities are not likely to cure all patients.

To go back to your question, we are getting closer to victory, and we are winning some battles, but the war is far from over.

Bob Barrett: Doctor, looking ahead, do you think that whole genome sequencing will play a major role in the diagnosis and management of cancer?

Dr. Eleftherios Diamandis: There are now multinational projects on the way, such as the International Human Cancer Consortium and The Cancer Genome Atlas, which perform whole genome sequencing on very large numbers of cancer tissues. These studies will undoubtedly continue and expand in the future and soon we will have many thousands of whole cancer genomes at our disposal.

Although it is difficult to make secure projections, it seems that this new wave of genomic information may pave the way for developing targeted drug therapies for many cancers.

And it is not only genomics, we now have in our armamentarium proteomics, epigenomics, metabolomics, glycomics, and other so-called "omics" which are also promising to revolutionize new methods for early cancer detection, as well as therapy.

Bob Barrett: Talk about some of the areas that are highly promising for alleviating the burden of cancer in the near future?

Dr. Eleftherios Diamandis: I already mentioned the genomic revolution and other "omics." We have now also learned that key enzymes of energy generating pathways are frequently mutated in some cancers.

The cancer stem cell hypothesis provides clues and opportunities for new diagnostics and therapeutics. We are also getting to understand better drug resistance, one of the most frustrating clinical problems, whereby originally highly promising therapies ultimately fail.

We also know that most patients with cancer die from metastatic disease, and a better understanding of the metastatic process and the tumor

microenvironment should identify relevant therapeutic targets and the development of newer and more effective drugs.

Also, the ultimate therapy for cancer is prevention. And there are now new ideas regarding chemopreventive drugs, vaccines, and diets, with anticancer properties. It is probably spectacular to mention that about 20% of all cancers are linked to a preventable cause, which is obesity.

Bob Barrett: Well, doctor, finally, do you have any closing comments for our readers and our listeners?

Dr. Eleftherios Diamandis: Well, I would mention that many scientists, including prominent ones, have made projections that cancer will be a preventable or highly treatable disease by year 2015.

While these projections did not come true, we should continue to feel optimistic that the rapid advances in the areas mentioned above will ultimately lead to dramatically better treatments in the near future.

We should recognize that despite the hurdles, slow but real progress has already been made and that the prospects for new progress in diagnostics and therapeutics for this devastating disease are better than ever.

Bob Barrett: Dr. Eleftherios Diamandis is Division Head of Clinical Biochemistry at Mount Sinai Hospital, Biochemist-in-Chief at University Health Network, Toronto. He has been our guest in this podcast from *Clinical Chemistry*.

I am Bob Barrett. Thanks for listening!