Today, I’d like talk about 4 topics related to the gastric cancer screening in Korea.

This slide shows the Korean cancer statistics in 2014. As you can see, gastric cancer is the most common malignant disease in males, and the number 4 in females. The incidence is still high, but two third of all gastric cancers are curatively treated.

The incidence of gastric cancer in Korea is slowly decreasing, but the mortality rate is rapidly decreasing. In 2013, the mortality/incidence ratio was 0.31 in Korea.

This pictures shows the estimated gastric cancer incidence and mortality in 2012. Korea and Mongolia is number one and two in the incidence of gastric cancer. The survival rate is highest in Korea followed by Japan. It is probably due to early detection by screening program and high surgical and endoscopic techniques.

From now on, I would briefly introduce Korean Cancer Screening Program.

In 1996, 10-Year National Plan of Cancer Control was launched. In 1999, National Cancer Screening Program for stomach, breast, cervical cancer started for members of lowest income family. It was free of charge. In 2005, trget population was expanded to the lower 50% of National Health Insurance beneficiaries. In 2006, screening for upper 50% income group started with 20% self payment.

So, there are two systems running together. One is National Cancer Screening Program and the other is National Health Insurance Cancer Screening Program. National cancer screening program is for members in lower income family, and everything is free. National health insurance cancer screening program is for member of higher income family, and they should pay 10%.

Most of the public budget comes form national health insurance. It is 90 percent. National government pay 5 percent, and local government pay another 5%.

Regarding the governance structure, National Cancer Center develops the screening strategy, and the national health insurance corporation and public health center actually run the program.

This is the recent screening program for five major cancers. It is stomach, liver, colorectal, breast and cervix.

The gastric cancer screening starts at the age of 40. Interval is every 2 years. The standard method is endoscopy. If endoscopy is not available, upper GI series is the secondary choice.

The most important issue is the screening interval. Currently 2 year interval is recommended. However, scientific evidence is not enough. One retrospective study from 연세 University showed no difference in the portion of endoscopically treatable gastric neoplasms between 1 year and 2 year interval.

The second issue is upper age limitations. In the academic guideline, the upper age limit for gastric cancer screening is 75. However, in the government program, there is no upper age limitations. The policy change seems to be very difficult.

All kinds of medical institutions participate in the gastric cancer screening program. General hospitals, small hospitals, primary clinics, and screening institutions are doing gastric cancer screening.

One special aspect of Korean cancer screening is opportunistic screening. It’s not a national, public, mass screening program. It is a personal, private program, and the cost is not covered by the government. It’s usually expansive.

The proportion of opportunistic, private screening is about 30%.

The participation rate of gastric cancer screening for the organized national program is about 45%. Including the opportunistic private screening program, the rate is about 75%.

In the gastric cancer screening, the rate of endoscopy is about 80%. Upper GI series is about 20%.

Gastric cancer detection rate by national cancer screening program by EGD or UGIS is about 1.4 out of 1,000 during 2002 and 2011. In that period, endoscopy and upper GI series was done half and half.

When the screening is done by endoscopy, the gastric cancer detection rate is 3 out 1,000. 75% is early gastric cancers.

This is a data from a big private cancer screening center. The detection rate of gastric cancer is about 2 out of 1,000 man and 1 out of 1,000 women.

Quality control is a big issue in every cancer screening program. Because of the time limitation, I cannot tell you much about the details. Anyway, we developed guidelines, run a huge education program, and evaluate the procedure and outcome regularly.

Before the next topic of outcomes, I would briefly tell you the biases of cancer screening.

The aim of cancer screening is clear. We hope to detect cancers as early as possible and treat them completely. The outcome is to live longer or forever. But we should consider the cost-effectiveness issue in every cancer screening program.

There are two important biases in the cancer screening. The first one is very famous, the lead time bias. I think all individuals in this room already understand this type of bias. Even if we may detect cancers earlier, the overall survival gain is another issue due to the lead time bias.

The second bias is the length-time bias. It means cancers detected in the screening program may be less aggressive. This bias is especially important for the elderly population. If some cancers in the elderly people are very slow-growing, is there any reason that we need to find them?

From now on, I will show you three scenarios. Green bar means advanced cancers. Blue bar means early cancers. This is the first scenario. By the cancer screening, advanced cancers decreased, and the early cancers increased. But the numbers of decreased advanced cancers and the increased early cancers are same. As a result, the total number was not changed. This is an ideal scenario of every cancer screening program, but it never happens.

The second scenario is more realistic. OK. The advanced cancers decreased a little bit, but the number of early cancers increased much more than that. As a result, we can see a huge increase of the total number of the target cancer. The overall mortality may decrease. But, do we need to treat all the early cancers?

The third scenario is a kind of nightmare. A lot of early cancers are found, the number of advanced cancers is the same. The treatment outcome may be the same. In this scenario, the screening may be useless.

So, for the establishment of a cancer screening program, we need to consider not only benefits but also cost and biases at the same time. Strong scientific support for the screening program should be provided by good outcome data.

OK. This is outcome data.

Outcome of the early period of national gastric cancer screening program was evaluated.

And recently published in the Gastroenterology journal. The primary outcome was gastric cancer specific mortality.

In average, the gastric cancer specific morality reduction was 21%. In the age group between 40 to 74 was 47%. So, in our early experience, half of the gastric cancer death can be prevented by national screening program.

The methods and frequency matters. The mortality reduction was 81% by repeated endoscopy, and 21% by repeated upper GI series.

By endoscopy, the effect of mortality reduction remained by 48 months from the cancer diagnosis to the last screening. This data supports 2 year interval.

The final topic is prevention by Helicobacter eradication.

Screening is just early detection and prevention of gastric cancer-related death. In order to prevent gastric cancer, H. pylori eradication may be the best option.

Actually true Helicobacter negative gastric cancer is very rare. In this study, Helicobacter negative gastric cancer is 2.3#

In this recent beautiful data from Korean National Cancer Center, Helicobacter eradication prevents metachronous gastric cancers after ESD for EGC.

In that study, atrophy and metaplasia was improved after Hp eradication.

Recently, Korean government expanded the indication of Helicobacter eradication. For patients with peptic ulcer, MALToma, EGC after ESD/EMR, ITP, Helicobacter eradication is formally covered. Although the coverage is limited, every patient with Helicobacter infection can be treated regardless of the indications.

Ladies and gentleman, I’d like to conclude my presentation by saying that gastric cancer screening program was successfully established in Korea. At least 80% of gastric cancer-related death can be prevented by endoscopy-based screening with 2-year interval.