

The future of eye care industry

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Hammurabi code for Malpractice

1750 BC - 1792 BC



- *“If a doctor operates on the eye of a patrician who loses his eye in consequence, his hands shall be cut off”.*
- *In the case of a slave, if the surgeon has caused his death the penalty was to replace him by another, and if he made the slave lose his eye, he shall pay half his value”* (Fishman, 1999)





Hammurabi set the first sliding price in history for cataract surgery

FEES for cataract surgery SILVER SHEKELS	FEES for cataract surgery in US \$	Patient's status	Quality control in failure
10	70,600 \$	Noble	<i>Surgeon's hands shall be cut off</i>
5	35,300 \$	Normal	<i>Not mentioned</i>
2	14,100 \$	Slave	<i>Surgeon shall pay half of his</i>





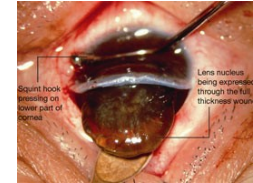
Technology changes through years



Couching 3857 years ago



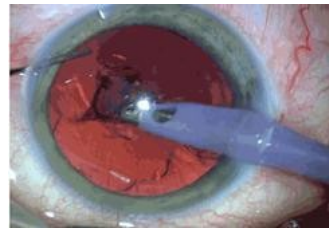
ICCE 552 years ago



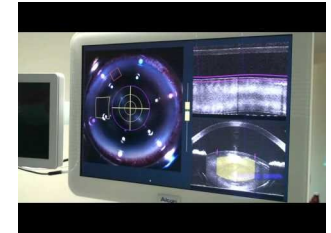
ECCE 65 years ago



SICS 50 years ago



Phaco 40 years ago



FLACS few years ago

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To achieve quality of vision

- We needed 3850 years to disrupt from couching to FLACS
- We needed 3300 years to revert from couching to an intraocular surgery
- We needed 50 years to refine the intraocular surgeries and reach FLACS
- What is next?





What to expect



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1. Mobile Diagnostic and Communication Tools:

- ✓ A low cost application designed to replace a \$5,000 auto refractor
- ✓ A simple technique of fundus photography using an iPhone
- ✓ A surgeon wearing Google glass virtual reality augmentation tools and simulators





2. Predictive Analytics / Big Data:

- “**Big Data**” and predictive analytics may also help identify patients most at risk for “NOT TAKING” their medication, ophthalmologists and other healthcare professionals will be able to take targeted action to help these at-risk individuals better adhere to their drug regiments.
- Sloan-Kettering, one of the world’s leading cancer centers, recently “**hired**” Watson, IBM’s powerful supercomputer, to help diagnose cancer faster, more affordably and more accurately.
- In the near future, similar tools may help diagnose patients for various eye-related diseases.





3. Pharmaceutical Advances: (Game changers)

- It has been estimated there are upwards of 500 eye-related pharmaceutical clinical trials currently under review.
- Many of these treatments will ultimately prove ineffective but if just a small percentage are successful they could be “game changers.”
- Pharmaceutical solutions for **presbyopia** and **myopia** are real possibilities.





4. Robotics:

- **Robotics** may soon be used in **vitreo-retinal** surgery and various other procedures.
- Advances in **microsurgical** devices point toward a bolder—and far less invasive—future for eye surgery.





5. Genomics:

- The cost of sequencing the human **genome** is regressing. As it does, society will come to a better understanding of the roles various genes play in the development of diseases such as diabetes and retinal degeneration.
- This new understanding may lead to earlier and better treatment of eye-related diseases like **diabetic retinopathy and retinitis pigmentosa.**





6. Retinal Prosthetics:

- In July of 2013, The Food and Drug Administration (FDA) approved the use of **Argus II**, a bionic eye; and in September, European regulators approved the use of **the Atlas IMS**—the first fully implantable, wirelessly controlled retinal prosthetic.
- At the present time both devices cost approximately \$100,000 and allow patients with retinitis pigmentosa to see in black-and-white.
- **In the near future**, as ever-more electrodes are packed into the device, the technology may allow the users—including those suffering from **age-related macular degeneration**—to see more clearly and in color.





7. Regenerative Medicine:

- The first successful **transplant of a biosynthetic cornea** occurred in 2010. Since that time, breakthroughs in biotechnology, material science and **3D** printing have accelerated the field and, in the not-too-distant future, biosynthetic corneas could help restore sight to the vast number of people who are currently waiting for a donated human cornea for transplantation.





8. Nanotechnology:

- Researchers at the University of Dayton Research Institute recently created **“fuzzy fiber” carbon nanotubes**. This could be a significant breakthrough for the treatment of **glaucoma** because the “fuzzy fibers” are biocompatible and can help prevent the build-up of fibroblasts.
- Other breakthroughs in nanotechnology include using **nanoparticles** for gene therapy—such as this one for the treatment of **macular degeneration**—and are quite exciting.





9. Stem Cell Advances:

- Advanced Cell Technology announced an innovative stem cell treatment which had developed , this treatment could corrected the eyesight of an individual with **20/400** vision to **20/40**.
- The company is equally excited about the possibility that stem cells can soon be used to treat Stargardt's macular dystrophy.





10. Neuroscience Advances:

- A research company **announced that its scientists could map the 950 neurons in the retina of a mouse**.
- It is only a matter of time before the neurons in the human retina are similarly mapped, **may lead to a new and deeper** understanding of the human eye.





Are we progressing



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If you cannot come first



Try not to be last

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How to catch up



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Group practice

- Helps to purchase more advanced diagnostic technology
- Helps to share experience and talents
- Helps to offer a better service through sub-specialty
- Helps to establish the Research and Development in the different country regions
- Helps to perform more surgeries with high efficiency
- Helps to call for innovations and updated techniques
- Helps physicians to decrease the risks and increase the profits





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Thank you

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