



Technology and Innovation in General Practice

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Signposts

Point of Care Diagnostic Devices

Wireless Technologies

International Technology and Innovation

What is Technology?

“The application of scientific knowledge for practical purposes, especially in industry”

“Machinery and devices developed from scientific knowledge”

- Cost effective
- Reliable

What is Innovation?

“The action or process of innovating”

“The process of translating an idea or invention into a good or service that creates value or for which customers will pay.

To be called an innovation, an idea must be replicable at an economical cost and must satisfy a specific need.”

POC Diagnostic Devices #1: Stethoscope

Stethos - Greek “front of the chest”

Skopos - Greek “watcher”



POC Diagnostic Devices #1: Stethoscope

1800s - Chest examination via palpation, percussion and immediate auscultation

- Issues with positioning of the ear and lack of amplification
- Issues with requiring direct physical contact



POC Diagnostic Devices #1: Stethoscope

Rene Laennec

- Improvises a tube out of a rolled sheet of paper (24 pages) = “Le Cylindre”
- Rene was a skilled wood turner and developed the Stethoscope further.



Breathe on

Stethoscope has come a long way since its invention 200 years ago

Origin: Greek

stethos: chest

scopos: examination



1816

French physician René Laënnec invents the first stethoscope—made of tightly rolled sheet of paper, which was later replaced with a hollow tube of wood



1850

First in the invention of stethoscope, Arthur Leared used zinc-coated and treated air evacuation technique

1851

Iron physician Arthur Leared covers his hand stethoscope made of a tough plastic substance called gutta serena



1852

New York-based physician George F. Emerson perfects the design for conventional probe tone, with ivory segments connected to metal tubes at various sites



1873

18th-century stethoscopes had one earpiece that could connect to different parts to create a slight sound effect, but to standardize



1945

The design by Kappasport and Spiegel becomes the standard, combining of two sides—one for heart, the other for lungs, with two hearing tubes



1960

David Wilson, a Harvard Medical School professor, creates a simple open-branch model with improved accuracy



1970

J&J Ultrasonics introduces the tunable dopplerson



1999

Richard Cooksoners patented DPC Future—the first non-invasive stethoscope



2015

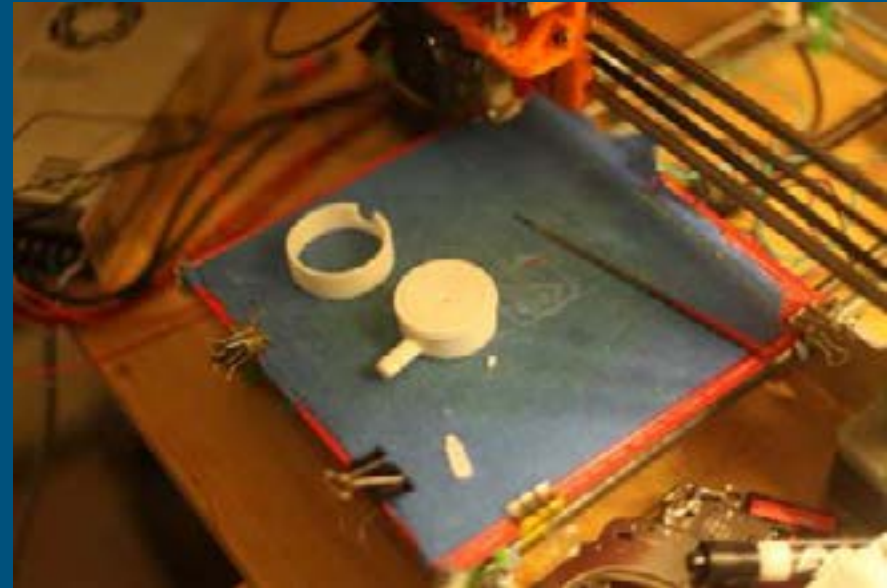
Polishman-Canadian doctor Terezi Lindberg invents an open-ear, 3D-printed stethoscope that costs less than \$100



POC Diagnostic Devices #1: Stethoscope

3D Printed Stethoscope

- Developed due to a lack of supplies in the region.
- ? Audio testing indicates comparable to Littman Cardiology III
- Dr Tarek Loubani - London trained Gaza Doctor



POC Diagnostic Devices #1: Stethoscope

3D Printed Stethoscope

- 3,777 Australian Medical Students Commenced in 2015
- Total Cost 3D Printed Stethoscope = \$9442.50
- Total Cost Cheapest Stethoscope on medshop.com.au = \$336,153



POC Diagnostic Devices #1: Stethoscope

Digital Stethoscopes

- Spirit, Littman, Welch Allyn
 - ~\$260 - \$700
- Thinklabs One
 - ~\$500
- Variety of Companion Apps
 - ThinkLink
- Bluetooth and Recording Functions



POC Diagnostic Devices #1: Stethoscope

Digital Stethoscopes

- Convert Analog to Digital
- EkoCore
 - \$200
 - Uses the Eko App



POC Diagnostic Devices #1: Stethoscope

Digital Stethoscopes

- Hearing Impaired
- Teaching
- Telemedicine
- Amplification
- Noise Reduction
- Recording Functionality

POC Diagnostic Devices #2: Ultrasound

Ultrasound

- Increasing application and reducing costs
- Dr Steinmetz and Dr Lewis - Canadian Family Physicians
 - Bedside Ultrasound Course
 - The Happy Baby Screening Tool



POC Diagnostic Devices #2: Ultrasound

Ultrasound

- i.e. Fujifilm Sonosite
- Mobile Phone Ultrasound
 - Mobisante - FDA approved US



POC Diagnostic Devices #2: Ultrasound

Ultrasound

- Applications
- Primary Care: Abdomen, Aorta, Kidneys, Gallbladder, Thyroid, Soft Tissue, Vascular, Small organs, Implants, Foreign Bodies, Bladder
- OB/GYN: Pregnancy confirmation/Dates, Viability, Placenta, Fetal presentation, Ectopic pregnancy, Amniotic Fluid Assessment
- Emergency Medicine: FAST exam to detect impact of trauma, Vascular, Small organs, Chest, OB/Gyn, Cardiac

Wireless Technologies: Biometrics

- Vscan Imaging Device
- Digital Stethoscopes
- Airstrip Technology, Aerotel
 - ECG, Pulse Oximetry, End Tidal CO2, standard vitals.
- Zio Patch
 - 7-14 day holter monitoring
- Medtronic M-link



Wireless Technologies: Other

- Health Buddy
 - Provider to Patient connection
 - Medication and Lifestyle Compliance
- Microchip Compliance Capsules



International Technology: Health Informatics

- Australia
 - NEHTA (National E-Health Transition Authority)
 - My Health Record
- Practice Incentive Payment available
- Opt-out Patients
- Patients are able to control their health records to a certain extent



The screenshot displays the My Health Record (MHR) interface. The main content area is titled 'Prescription and Dispense View'. It shows a table of prescriptions and dispenses for a patient. The table has columns for 'Prescription', 'Dispense', and 'Dispensed'. The data is as follows:

Prescription	Dispense	Dispensed
12/12/2011 09:00:00 12/12/2011 09:00:00 12/12/2011 09:00:00 12/12/2011 09:00:00 12/12/2011 09:00:00	12/12/2011 09:00:00 12/12/2011 09:00:00 12/12/2011 09:00:00 12/12/2011 09:00:00 12/12/2011 09:00:00	12/12/2011 09:00:00 12/12/2011 09:00:00 12/12/2011 09:00:00 12/12/2011 09:00:00 12/12/2011 09:00:00

International Technology: Health Informatics

- Denmark
 - Primary Care Physicians
 - Gatekeepers and Co-ordinators
 - Physicians - Specialists - Pharmacies - Laboratories - Hospitals
 - Patients have access online
 - Use in information gathering and quality assurance.
- Why does it work?
 - Smaller population - 5.5 million
 - Rapid clinical acceptance
 - Developed in close consultation with clinicians
 - Financial incentives
 - Technical Support - On-Site
 - Multiple databases - Medcom acts as a data integrator

International Technology: Health Informatics



The End...or the Beginning?

Any Questions?

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