(R)evolutions in technology: Do they really matter for nurses?
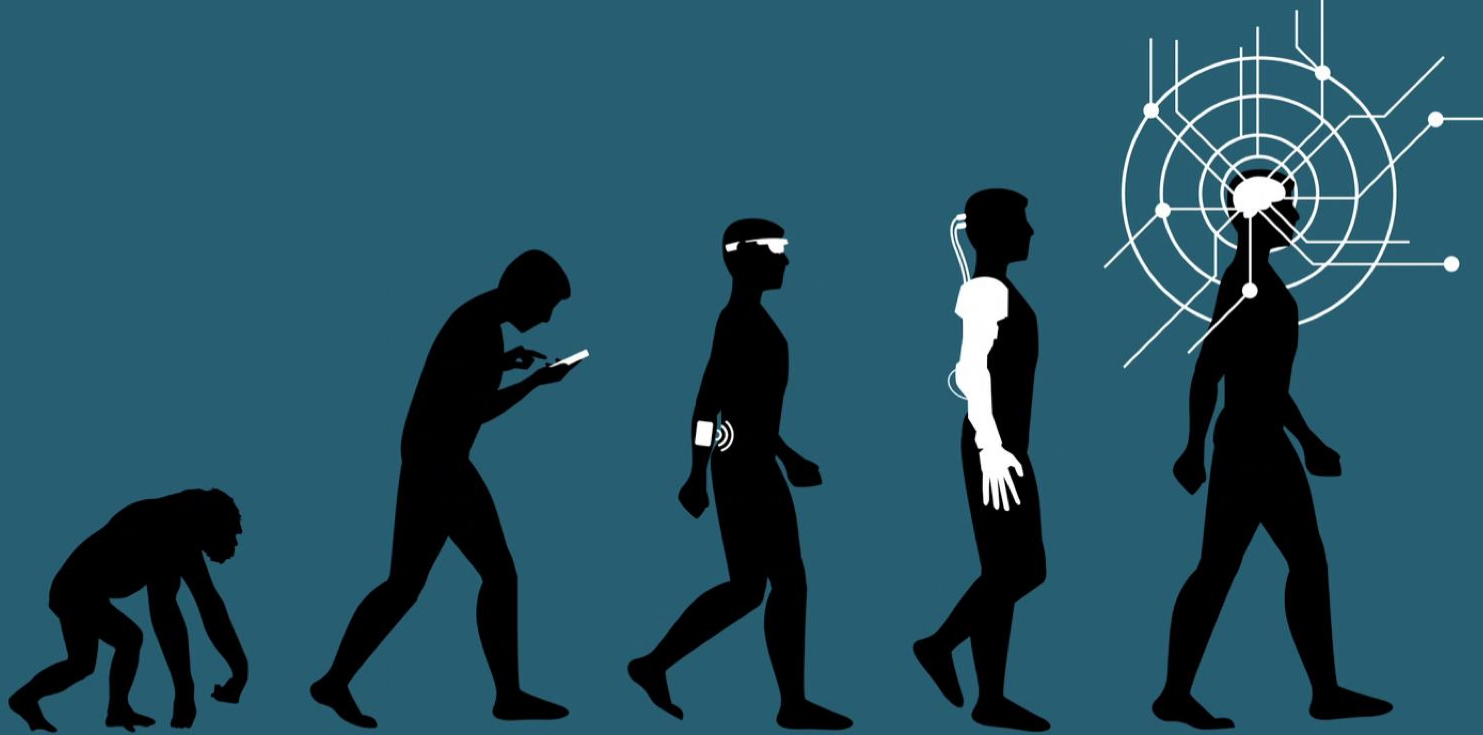
by

Maria Teresa Parisotto, RN, BSc

EDTNA/ERCA Secretary
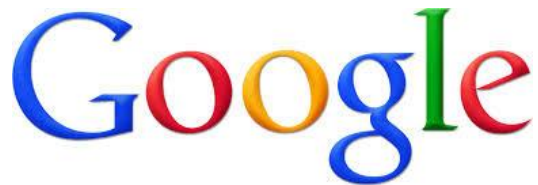
HUMANITY WILL CHANGE MORE IN THE NEXT 20 YEARS THAN IN THE PREVIOUS 300 YEARS

Understanding the Intersection of Humanity and Technology (1/3)

- Is Technology already here?
- How is Technology affecting our daily life?

Understanding the Intersection of Humanity and Technology (2/3)

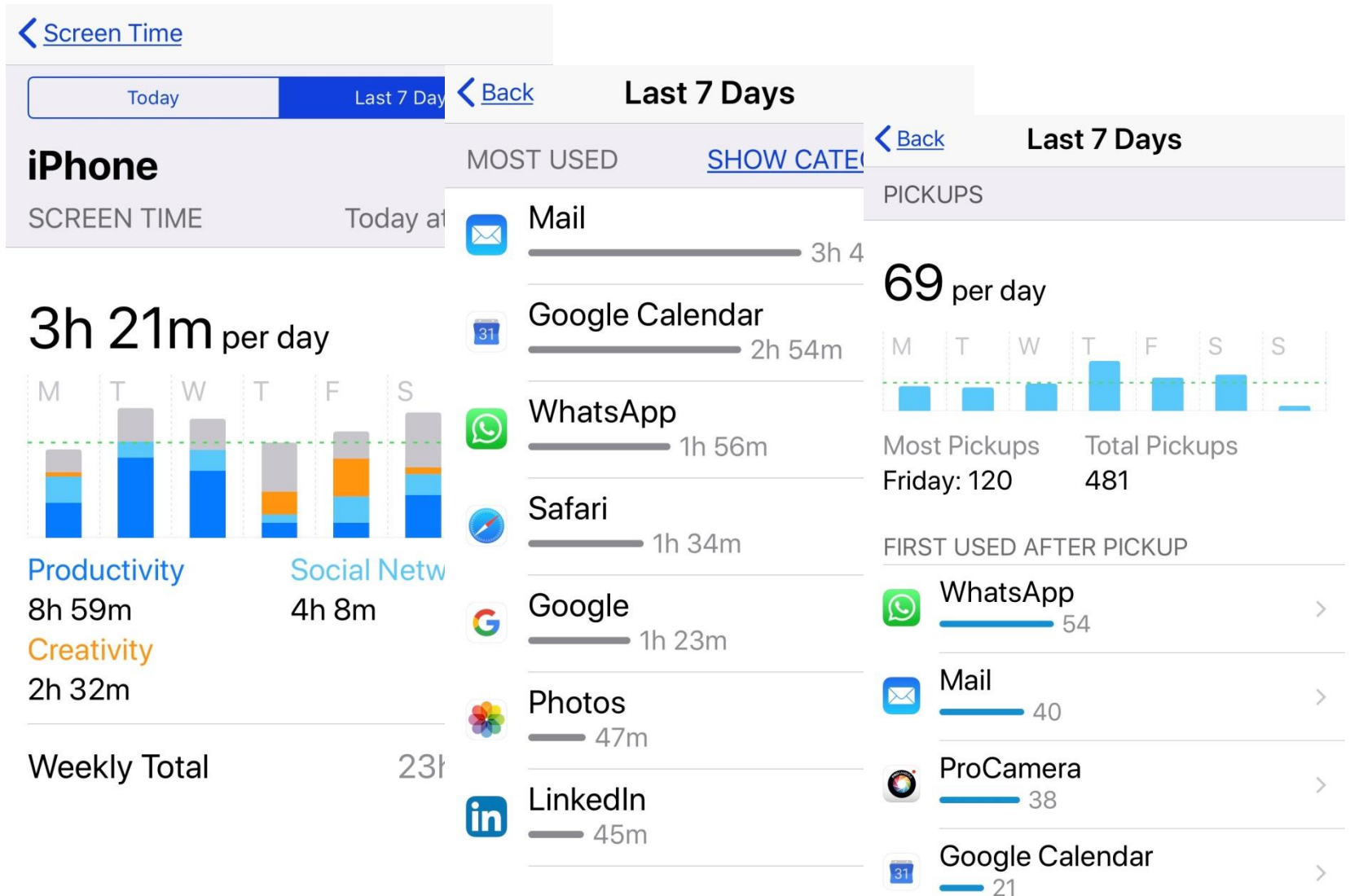**3.8 million** searches per minute

2.2 billion of monthly active Facebook users worldwide as of 2nd quarter 2018

According to 2nd quarter 2018 report, Apple sold **667,000 iPhones** per day

Understanding the Intersection of Humanity and Technology (3/3)

EDTNA/ERCA Caring Together

Screen Time

| Today | Last 7 Days |

iPhone

SCREEN TIME Today at

3h 21m per day

M T W T F S

Productivity
8h 59m

Social Netw
4h 8m

Creativity
2h 32m

Weekly Total 23h

Back **Last 7 Days**

MOST USED   SHOW CATEG

✉ Mail
3h 4

📅 Google Calendar
2h 54m

🟢 WhatsApp
1h 56m

🧭 Safari
1h 34m

G Google
1h 23m

🌸 Photos
47m

in LinkedIn
45m

Back **Last 7 Days**

PICKUPS

69 per day

M T W T F S S

Most Pickups
Friday: 120

Total Pickups
481

FIRST USED AFTER PICKUP

🟢 WhatsApp
54 ›

✉ Mail
40 ›

⚫ ProCamera
38 ›

📅 Google Calendar
21 ›

5

Breakthrough Innovation in the 21ˢᵗ Century (1/4)

BREAKTHROUGH INNOVATION IN THE 21ST CENTURY

- In a global survey of 1,000 business leaders, more than 60% believe that a cure for cancer is only 10 years away.
- The vast majority are also confident that the world's food supply challenges will be solved in less than 35 years.
- A similar number expect nearly complete reliance on renewable energy in the same time frame.

WHICH BREAKTHROUGH INNOVATIONS ARE ON THE HORIZON?

Percentage of respondents indicating the expected time frame for each innovation

● NEXT 5 YEARS ● NEXT 10 YEARS ● NEXT 35 YEARS ● MORE THAN 35 YEARS ● NEVER
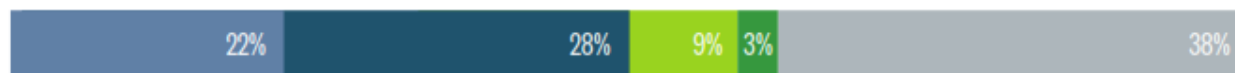
Autonomous vehicles

| 48% | 42% | 10% | 1 |

VR capabilities for advanced problem solving

| 33% | 50% | 14% | 3% | 1 |

AI/robotics significant part of workforce

| 26% | 43% | 26% | 5% | 1 |

A secure internet

| 22% | 28% | 9% | 3% | 38% |

Medical breakthroughs for curing cancer

| 19% | 47% | 28% | 5% | 2 |

SOURCE: HARVARD BUSINESS REVIEW ANALYTIC SERVICES SURVEY, MAY 2017

- *47% of respondents, thinks that Medical breakthroughs for curing cancer will happen in 5 years.*

MEDICAL AND COMPUTER SCIENCES WILL LEAD FUTURE BREAKTHROUGH DISCOVERIES

Percentage of respondents indicating which areas of discovery have the greatest breakthrough potential in the next 35 years [UP TO THREE SELECTED]

| 69% Medical sciences | 67% Computer science | 43% Biological sciences | 24% Materials science | 19% Physics | 18% Humanities & social sciences | 15% Earth sciences | 10% Astronomy | 7% Chemistry | 7% Mathematics |
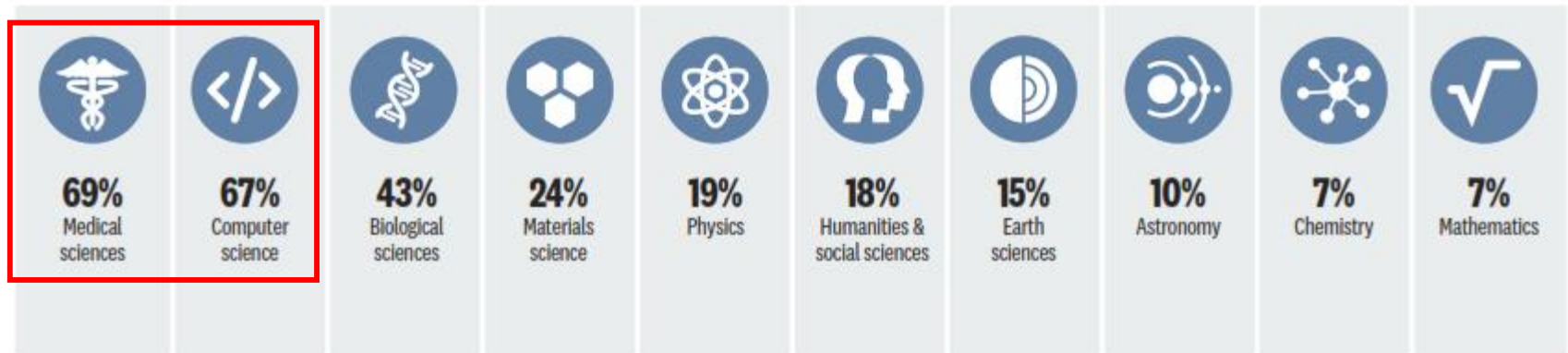
SOURCE: HARVARD BUSINESS REVIEW ANALYTIC SERVICES SURVEY, MAY 2017

- *Respondents think that Medical and Computer sciences will lead future breakthrough discoveries (69% medical and 67% computer)*

8

WHICH INNOVATIONS WILL HAVE THE GREATEST IMPACT ON SOCIETY AND INDUSTRY?

Percentage of respondents indicating which 5of the following innovations would have the greatest impact

Agricultural/economic food-supply innovations
54%

Medical breakthroughs for curing cancer
51%

Reversal of the effects of climate change
42%

Genetic modifications to humans
38%

SOURCE: HARVARD BUSINESS REVIEW ANALYTIC SERVICES SURVEY, MAY 2017

- *When asking which innovations will have the greatest impact on society and industry, the respondents put medical breakthrough for curing cancer in the second position (51%).*

Tech-giants & start-ups entering healthcare

Amazon gets into healthcare with Warren Buffet and JPMorgan

Healthcare costs have become a "tapeworm" on the US economy, said Buffet.

Tech-giants & start-ups entering healthcare

Apple is launching medical clinics to deliver the 'world's best health care experience'

Apple is planning to launch health clinics for employees

CNBC

Tech-giants & start-ups entering healthcare

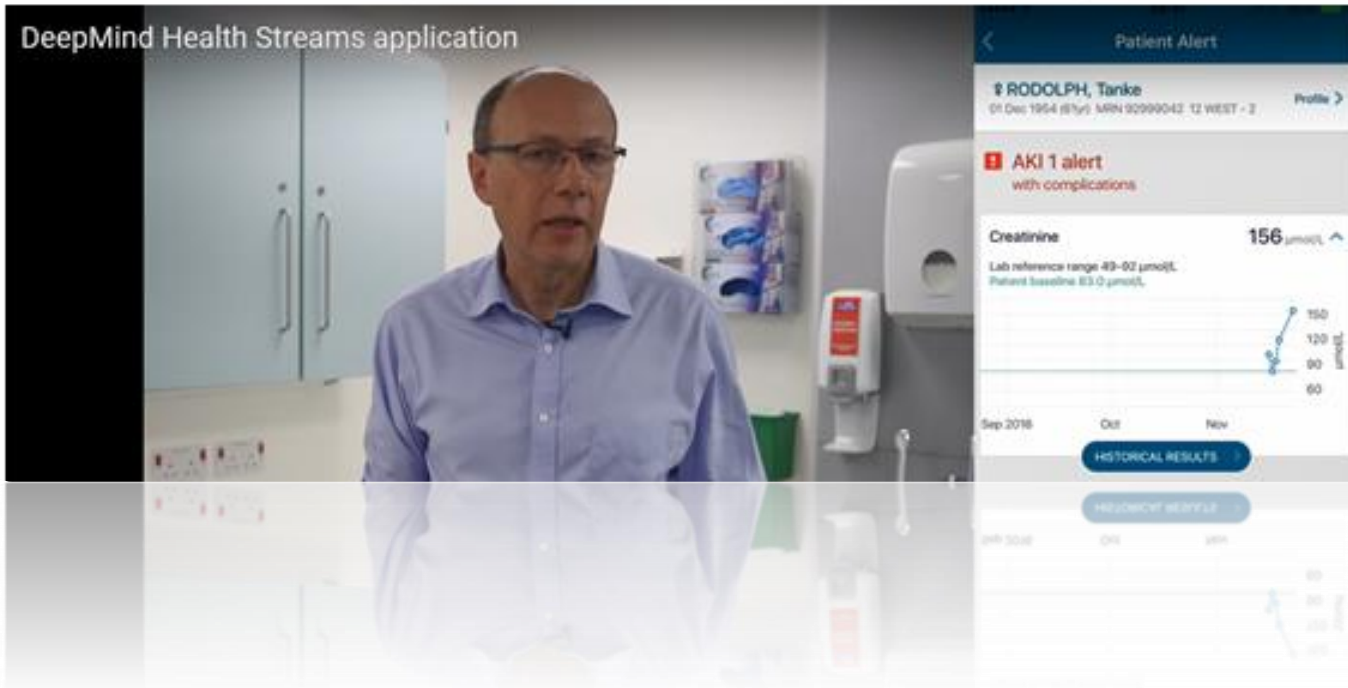# The Health Care Tech Innovation

- Innovation in healthcare continues to be a driving force in the quest to **balance cost containment** and **health care quality**.

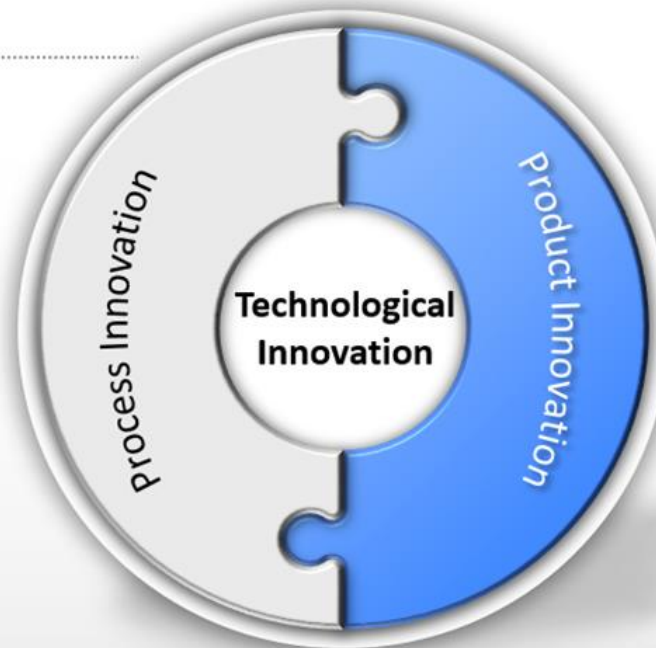- Innovation is considered to be a critical component **to improve patient care.**

The Health Care Tech Innovation

- Technological innovations present vast opportunities for:

Process Innovation

Enhancement of internal processes to improve patient care

Process Innovation

Technological Innovation

Product Innovation

Product Innovation
Introduction of new types of product improving safety

Digital is rapidly impacting the way how healthcare is delivered
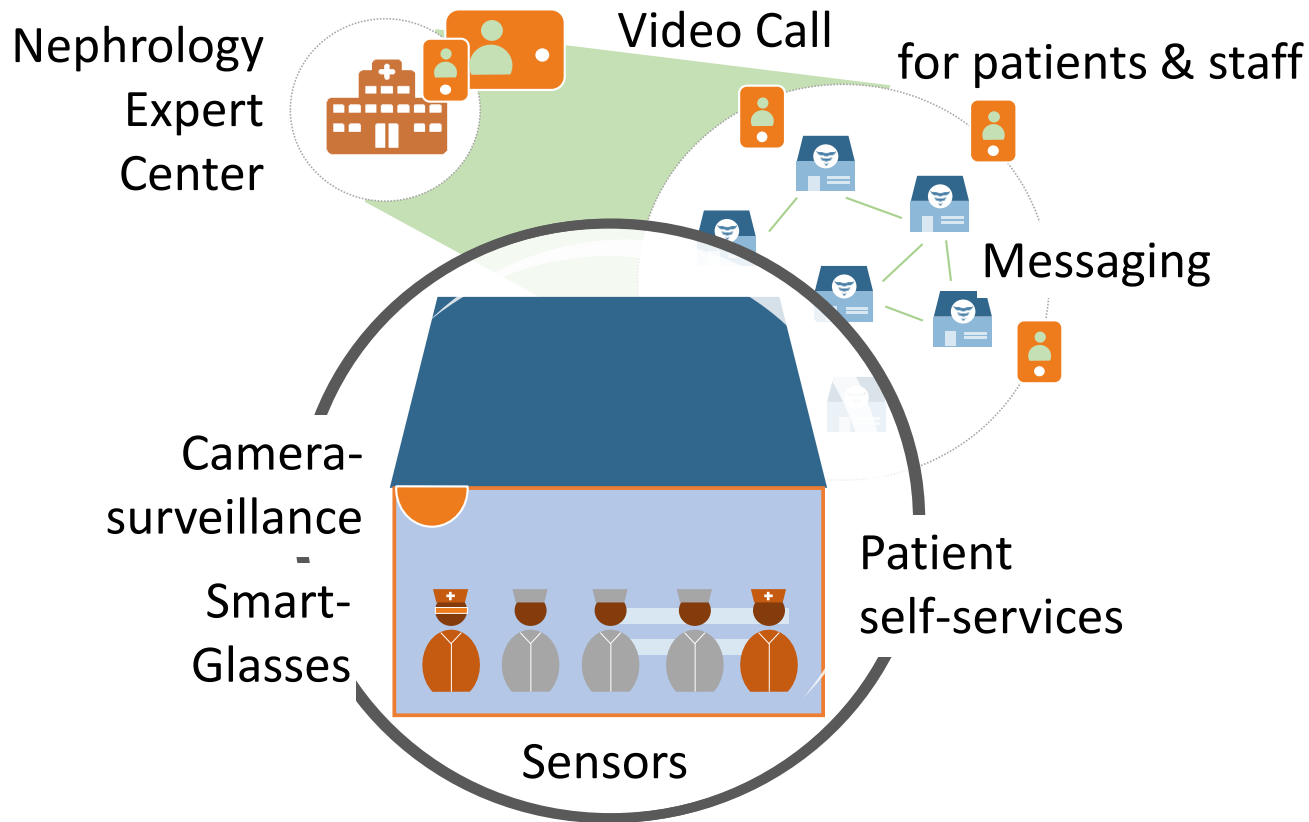
Physician & nurse shortage

Healthcare budget restrictions

Tech-giants & start-ups entering

Patients going digital

Virtual Dialysis Assistance: Enable cost-efficient remote dialysis care

Nephrology Expert Center

Video Call

for patients & staff

Messaging

Camera-surveillance - Smart-Glasses

Patient self-services

Sensors

MyKidneys: Improve health behavior via digital platform for CKD patients

MyKidneys
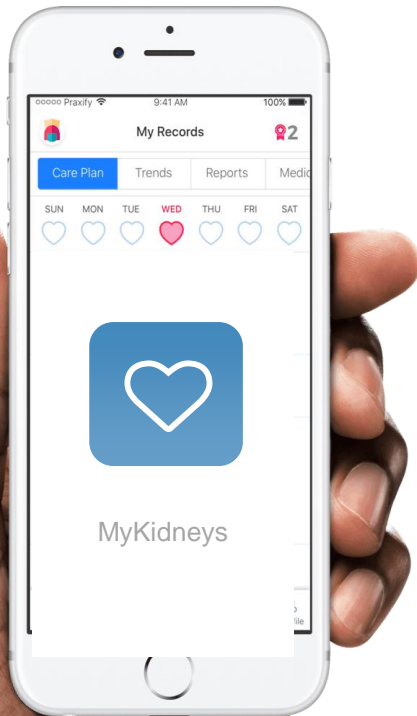
Final functionality to be defined after user needs assessment

Cutting Edge CKD Care Activation Tool

Incentive-based activity program
- Rewards for compliant behavior. Earn points for the completion of activities

Virtual Health Coaching
- Customizable care plans to treat individual comorbidities
- Promotes self-management

Seamless connected device integration
- Easy integration of Blood Pressure, Scale, Dipsticks, etc.

Medication adherence
- Reminders for medications
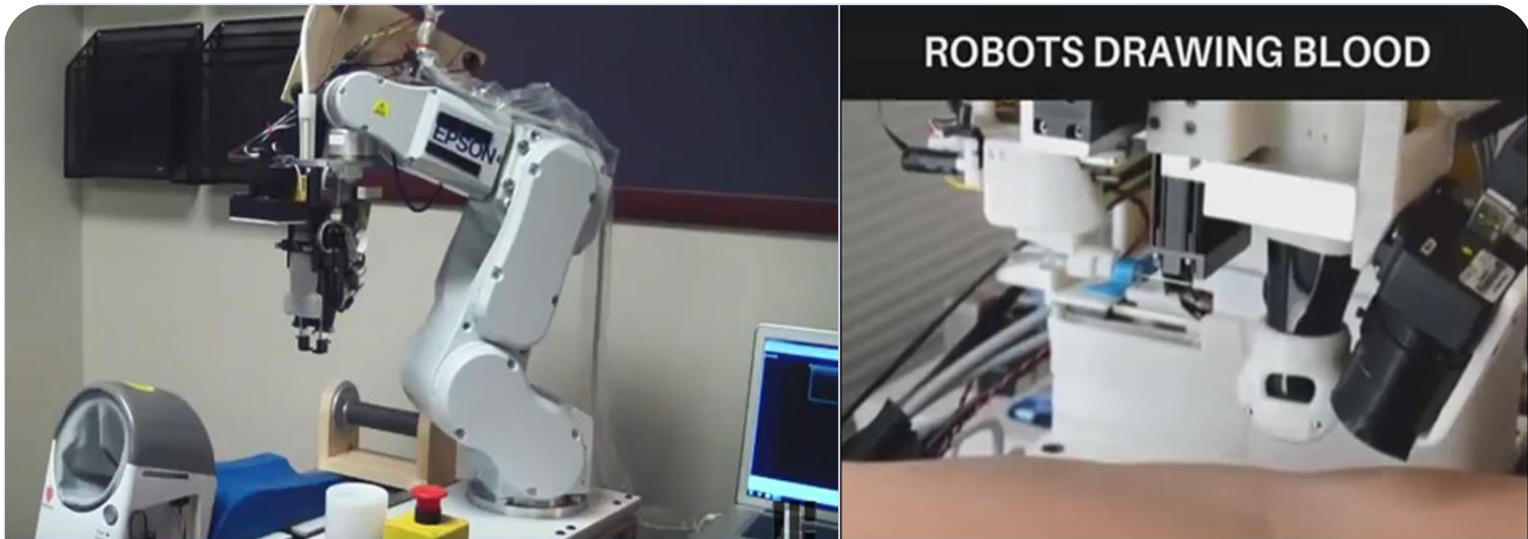- Drug Checker for OTCs

Medical record access
- Access and share medical records

CKD Patient Community
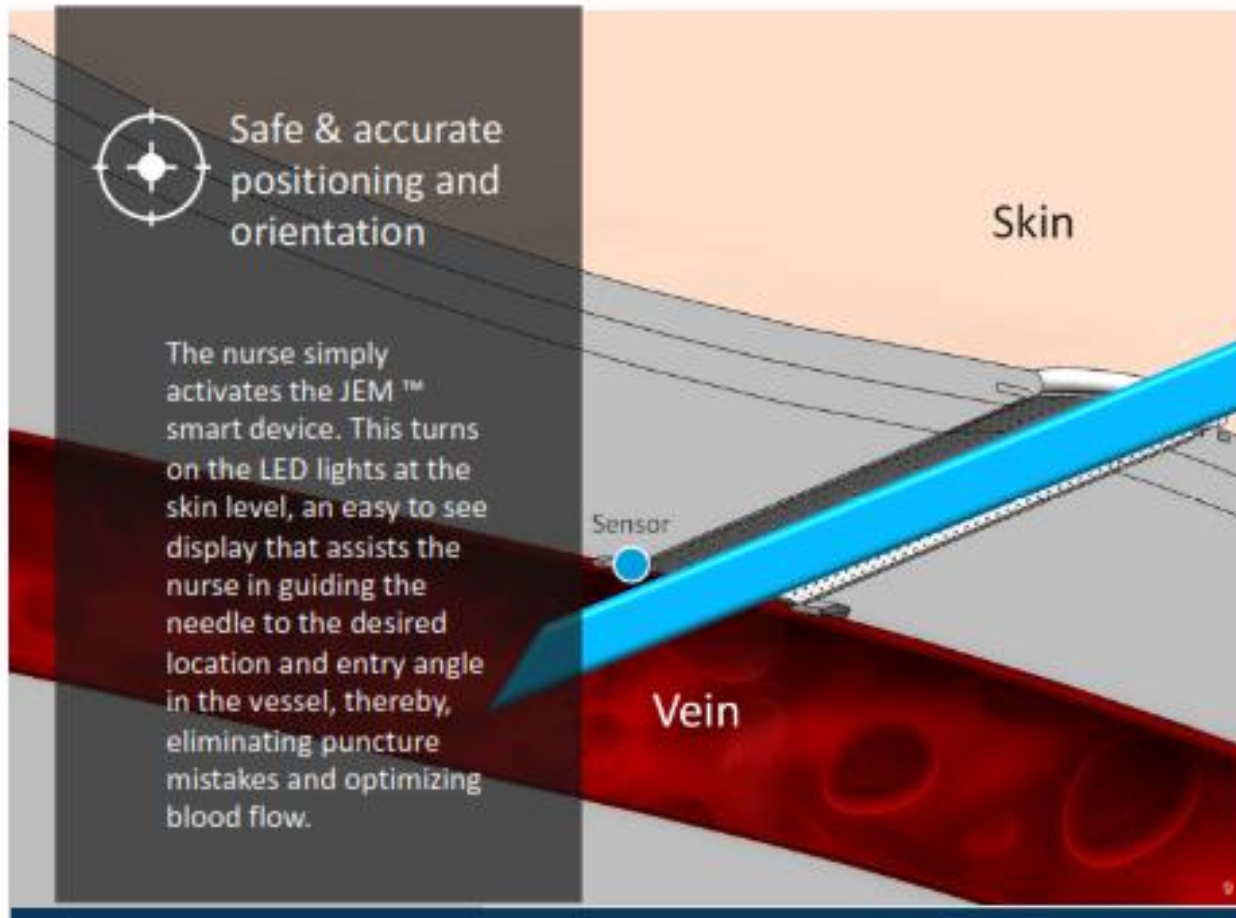- Allow patients to share their stories and coach/motivate each other

The Health Care Innovation: Robotics can substitute manual work

Veebot is automating venipuncture through computer vision and robotics, making it safer for both patients and medical staff, and cost efficient for medical facilities.
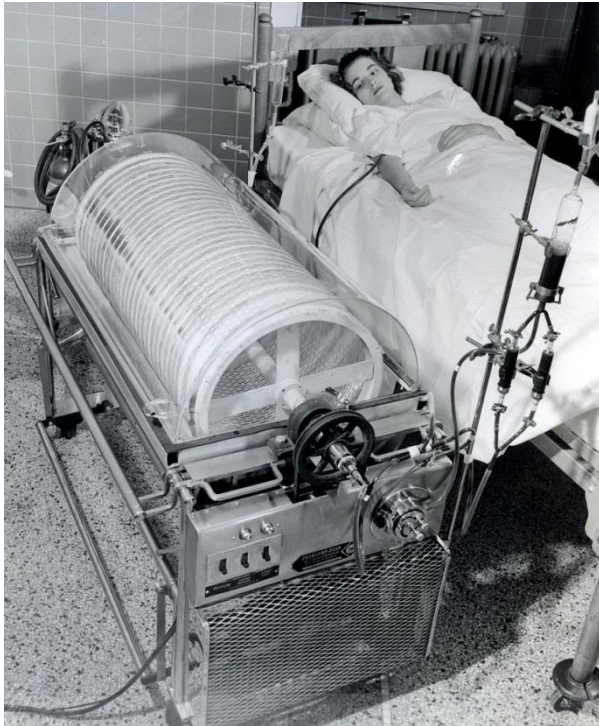
The Health Care Innovation: accurate position of the needle in the vessel

Safe & accurate positioning and orientation

The nurse simply activates the JEM ™ smart device. This turns on the LED lights at the skin level, an easy to see display that assists the nurse in guiding the needle to the desired location and entry angle in the vessel, thereby, eliminating puncture mistakes and optimizing blood flow.

Skin

Sensor

Vein

Two example of technological changes in the last 60 years

Incredible facilitation of the nursing work in dialysis

A dialysis machine in the 50s

A modern dialysis machine

Two example of technological changes in the last 60 years

Incredible facilitation of the nursing work in dialysis
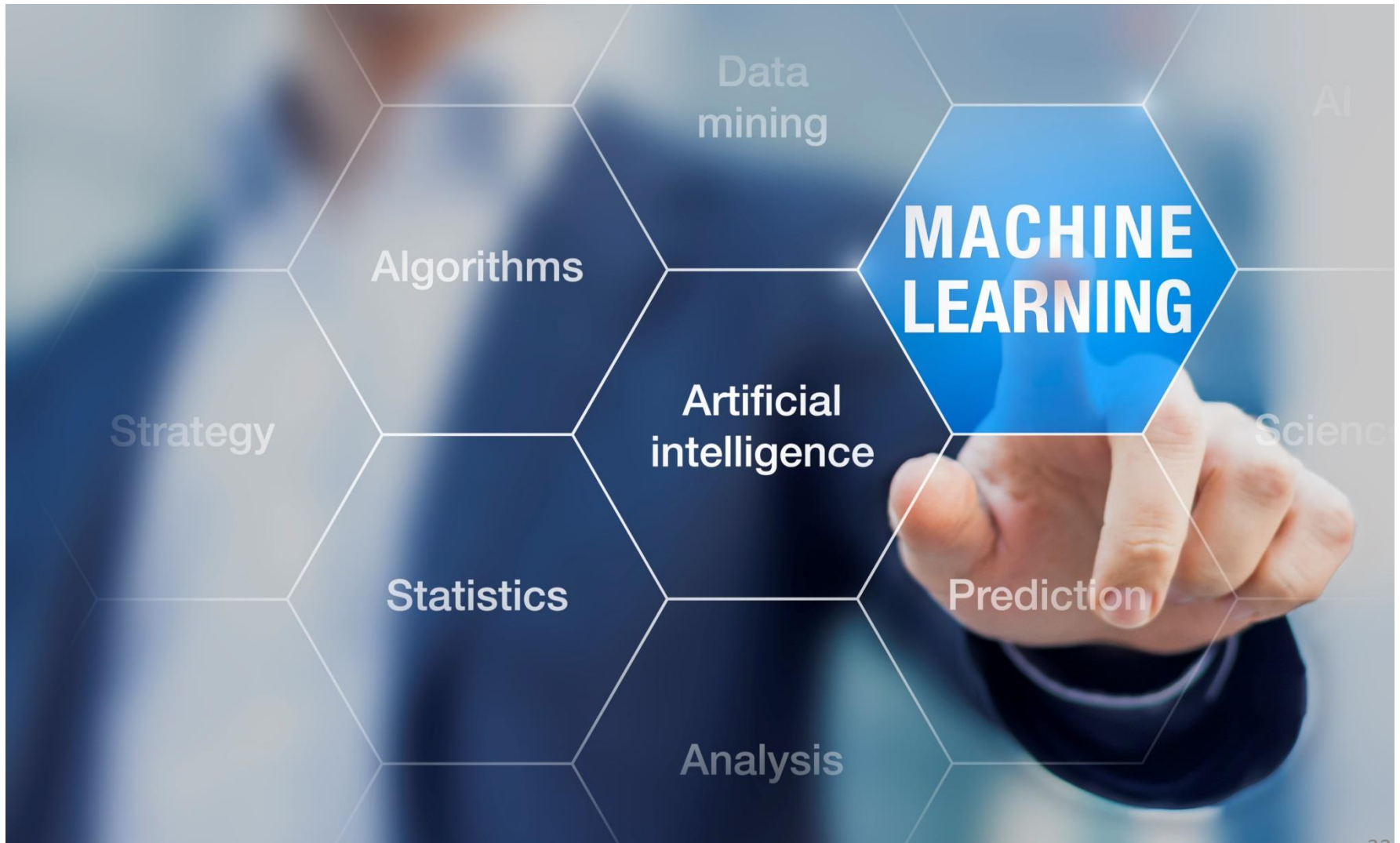

A dialyser in the 50s

A modern dialyser

# The Health Care Innovation: Artificial Intelligence (AI)

The Health Care Innovation AI: The Watson Software

In February 2013, IBM announced the Watson software for **management decisions** in **lung cancer** treatment at **Memorial Sloan Kettering Cancer Center, New York City,** in conjunction with health insurance company WellPoint. The software give guidance on examination and therapy.
90% of nurses in the field who use Watson now follow its guidance.

The Health Care Innovation AI: Predictive models

Patient temporal evolution: model(blue) vs real(red)
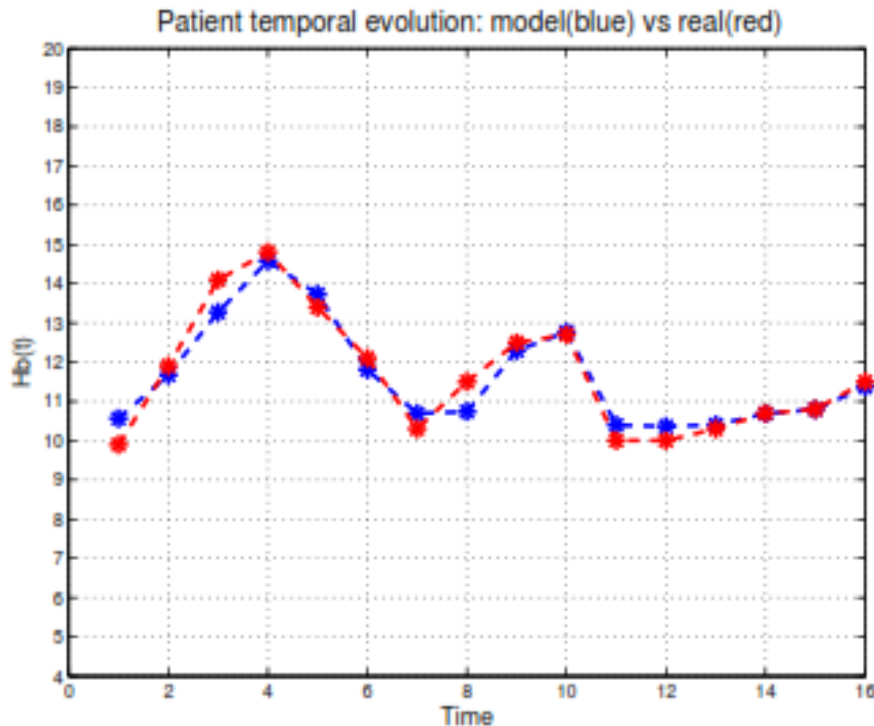
Predictive Model – response to anemia therapy*

- Iron supplement and especially Erythropoiesis Stimulating Agents (ESA) have become the treatment of choice for that anemia for CKD patients.
- A reliable Machine Learning approach to predict Hb values in patients undergoing secondary anemia to CKD.

Other Predictive Models:
- Mortality
- CKD progression
- Vascular Access failure
- Patient fall

EDTNA/ERCA
Caring Together

"Will AI replace me? The short answer is **NO**.

The core of Nursing Care

- No one can disagree with the advanced achievements of medical technology and growing specialization. **However, care is more than cure.**
- Caring is more than being patient-centered. **Care needs to recognize every person as human beings** whose experiences affect health and wellbeing directly.
- Nurses need to develop the "**head, hand and heart" approach**, which incorporates **practical know-how with empathic understanding and technical knowledge to provide humane and sensitive care.** (*Hemingway, 2013*).

WE **CARE** FOR A PERSON AND **CURE** A ILLNESS!

The core of Nursing Care: Balancing Technology and Compassion

- Dialysis practice is **a mixture of caring and technological activities.** Therefore the balance between these two elements must be appropriate to avoid the risk of dehumanize the patient.
- **Technology makes nursing easier** in a fast paced, complex work environment—but it should not cloud judgment or become the final word.
- **Critical thinking is at the heart of being a good nurse.**
- Any act of caring starts with guidelines, theory that you know, use of technology and you build on that through your experience, but then **there's the human factor.**

The Health Care Innovation: Nursing Profession repositioning (1/2)

Nurses have two choices:

- Continue to work with a dependent role (e.g. execution of medical orders, physician-initiated treatment etc.)
- Find an interdepend role (e.g. communication, case management, coordination of care, monitoring & reporting etc.)

The high nursing education allow or even recommend nurses to reposition themselves in a more independent/interdependent role.

Technology can help: by reducing the manual work, the time required to perform routine tasks, efficiency can improve and costs can be optimised. Therefore nurses can find a different position in the health care sector.

- *Irvine* think that working in a interdependent roles and functions can help the inter-professional collaboration to attain the common goal of quality care.
- Conceptual models were developed which relate the achievement of specific outcomes to nurses' independent, dependent, and interdependent roles and functions
- *Peter Griffiths* describes Nursing Sensitive Outcome as aspects of experience, behaviour and patients´ health state determined totally or partially by nursing care with variations depending on the quality and quantity of nursing care.

Nurs Econ. *1998 Mar-Apr;16(2):58-64, 87.* **Linking outcomes to nurses' roles in health care.**
Irvine D[1], *Sidani S*, *Hall LM*.

National Nursing Research Unit (2008) - **State of the art metrics for nursing: a rapid appraisal**
Peter Griffiths with Simon Jones, Jill Maben and Trevor Murrells

The Patients outcome evaluation: In which country is it done?

USA

1. National Database of Nursing Quality Indicators (NDNQI)
2. California Nursing Outcomes Coalition (CalNOC)
3. Military Nursing Outcomes Database (MilNOD)
4. Veterans Affairs Nursing Outcomes Database (VANDOD)

CANADA

1. Health Outcomes for Better Information and Care (HOBIC)

AUSTRALIA

1. Community Nursing Minimum Data Set (CNMDSA)

SWITZERLAND

1. Nursing Minimum Datasets (CH-NMDS

BELGIUM

1. Nursing Minimum Datasets (B-NMDS)

THE NETHERLANDS

1. Nursing Minimum Datasets Netherlands (NMDSN)

Who was the Nurse yesterday?

- A person taught to follow the physicians' orders or to be her handmaiden
- A person educated to focus on:
  - ✓ Own virtues rather than knowledge
    - Honesty
    - Holism and humanism
    - Compassion
    - Caring

Who is (or can be) the Nurse today?

- Nursing is a package of medical, technical, caring, nursing know-how
- Nurses can work at Hospital bedside, Universities, Research Institutes, LAB, Industries, Parliament, Professional groups defining strategies and policies etc.

- Gordon, S. (2006). What do nurses really do? Topics in Advanced Practice Nursing eJournal, 6. Retrieved from http://www.medscape.com/viewarticle/520714
- The Guardian: Views from the NHS Healthcare Network. "**I despair at the public's perception of nurses as selfless or sexed up**" June Girvin registered nurse and pro vice chancellor and dean, faculty of health and life sciences, Oxford Brookes University - Mon 14 Sep 2015

- Modern Nursing must be open to Innovation, should be ready to use Technology, but should not forget that:

Nursing is First of All an Act of Caring

Thanks you very much for your attention