Health Technology Assessment and Primary Care

卫生技术评估和基本医疗

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A CENTURY OF SAVING LIVES
MILLIONS AT A TIME

JOHNS HOPKINS
BLOOMBERG SCHOOL
OF PUBLIC HEALTH

What is Health Technology?
什么是卫生技术

- **Health technology** is the practical application of knowledge to improve or maintain individual and population health (Goodman 2004). 卫生技术是改善或维持个人和人群健康的知识应用。

- Main categories of health technology include drugs, biologics, devices, equipment, supplies, medical/surgical procedures, public health programs, support system, organizational and managerial system. 卫生技术的主要类别包括药物，生物制剂，器材，设备，用品，手术，公共卫生项目，支持系统，组织和管理系统。

What Is Health Technology Assessment
卫生技术评估

- **Health technology assessment** is the systematic evaluation of the properties and effects of a health technology, addressing the direct and intended effects of this technology, as well as its indirect and unintended consequences, and aimed mainly at informing decision making regarding health technologies.

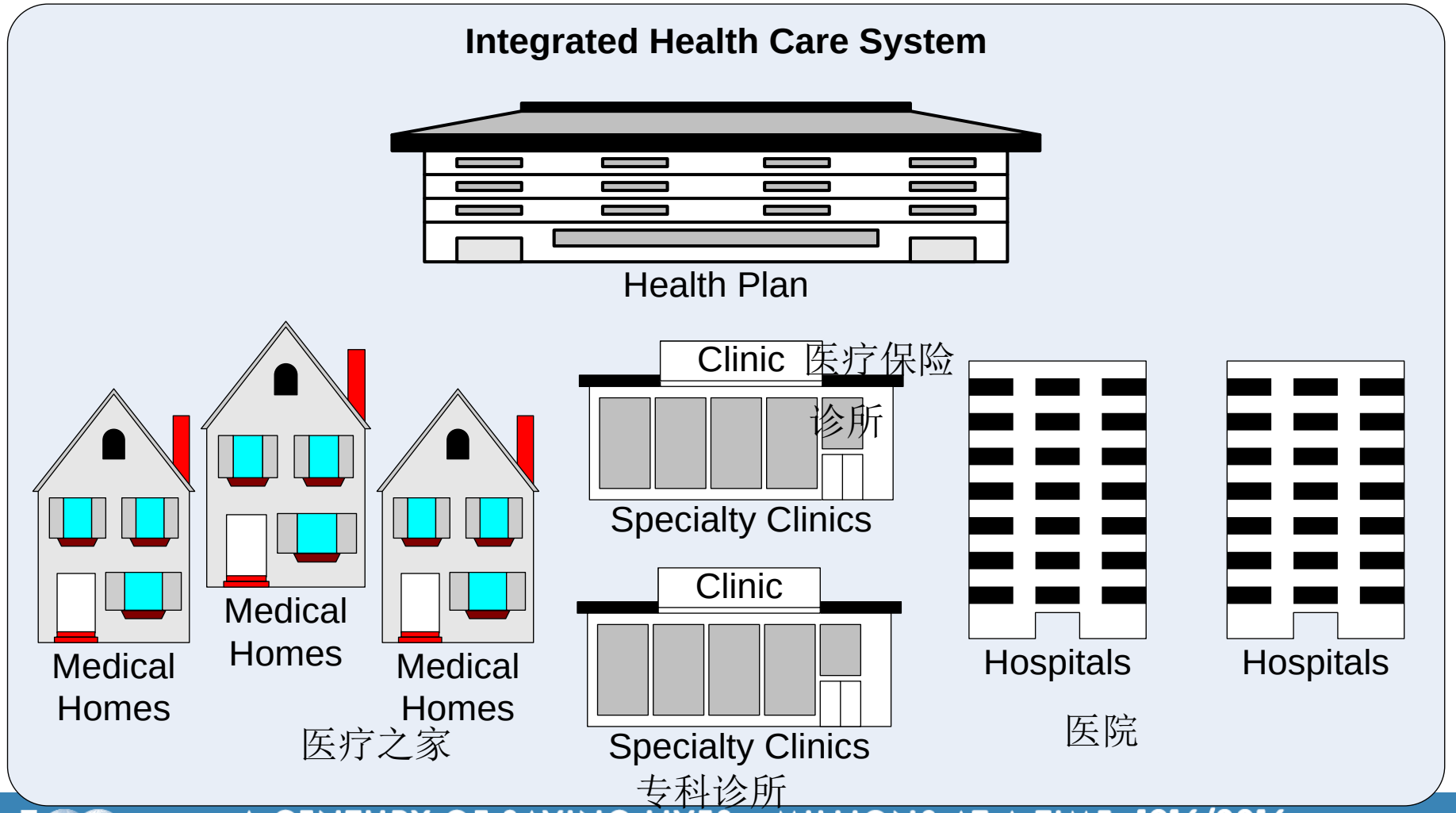
  卫生技术评估是对卫生技术的特征和影响的系统评估，针对这一技术的直接和预期的影响，以及其间接和非预期的后果，目的是为了影响针对该项卫生技术的决策。

What Is Primary Care: WHO
基本医疗：世界卫生组织

- "Essential health care…made universally accessible to individuals and families in the community…at a cost that the community and country can afford…It is the first level of contact of individuals, the family, and the community with the national health system, bringing health care as close as possible to where people live and work and constitutes the first element of a continuing health care process." 可及的,可承担的, 首诊的, 家庭和社区中,整合的

World Health Organization, 1978

Integrated Healthcare System with Primary Care as its Focus
基本医疗整合医疗系统



WHO Declaration
世卫组织宣言

- In 2008, the World Health Organization urged that primary care systems be strengthened in all countries and primary care be used as a model to provide fair, effective, and efficient care. 2008年，世界卫生组织督促各国强化基本医疗体系，并通过基本医疗提供公平、有效和高效的医疗服务。
- *Source:* The World Health Organization: The world health report 2008: primary health care now more than ever. Geneva, Switzerland.

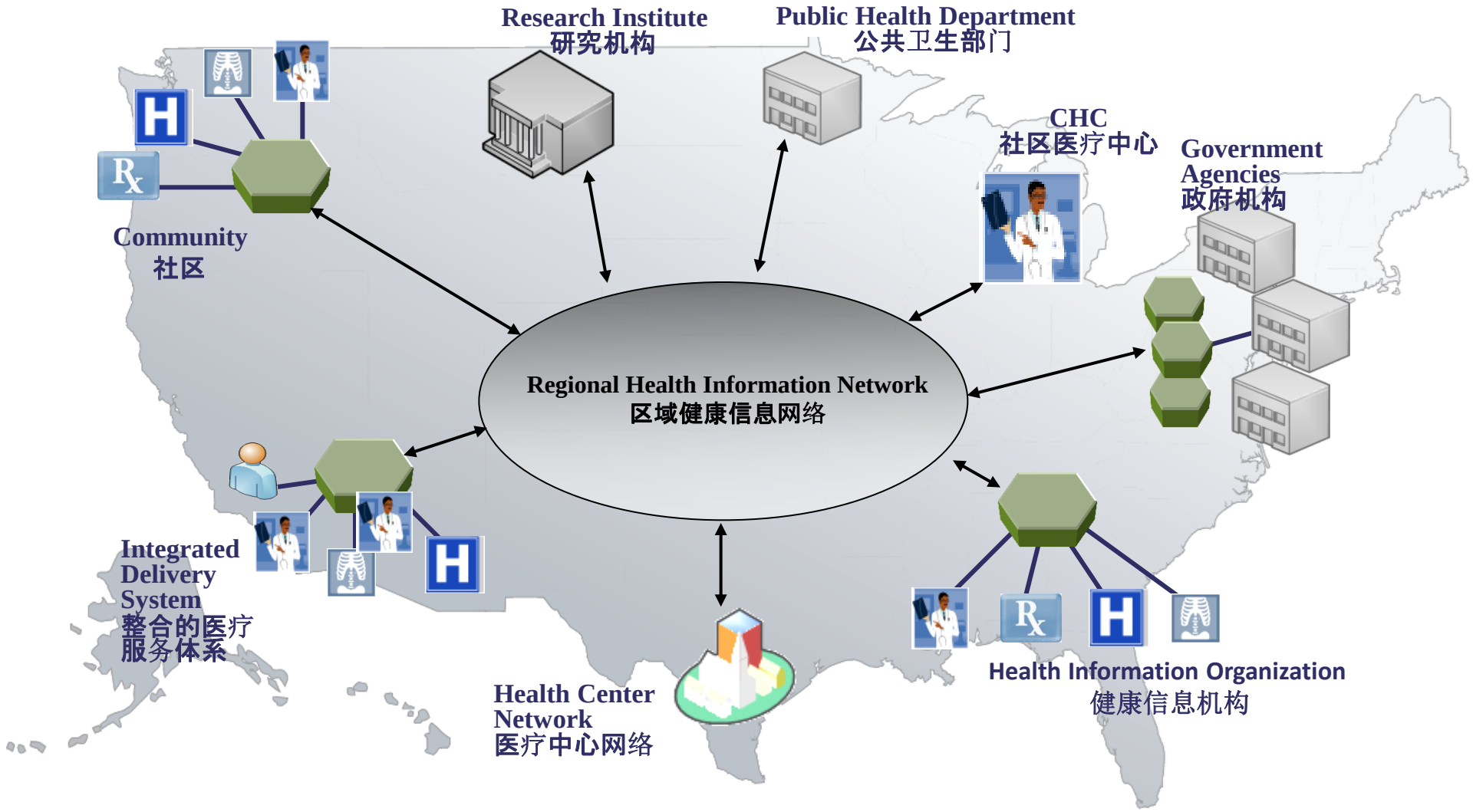
Medical Technology Used in Primary Care
医疗技术在基本医疗中的应用

- M-health 移动医疗
- Tablet PCs 平板电脑
- E-health 电子医疗
- Health Information Exchange (HIE) and Nationwide Health Information Network (NwHIN) 医疗信息交流平台与全国医疗信息网
- Personal Health Records (PHRs) 个人健康记录
- Patient portals 患者客户端
- Telemedicine 远程医疗
- Mobile home healthcare 移动家庭医疗
- Mobile learning 移动学习

- Genome-based personalized medicine 基因组个性化医学

- Nanomedicine 纳米医学
- Virtual Clinics/Kiosk 虚拟诊所/ 医疗亭
- Clinical decision support (CDS) 临床决策支持
- Application in Geographical Positioning System (GPS), Radiofrequency Identification (RFID), voice recognition, digital ink, and cloud computing 应用全球定位系统、射频识别、语音识别、数码墨水、和云计算技术

Improving Health Information Technology Is Critical to Delivering Integrated Care
提升医疗信息技术是提供整合的医疗服务关键



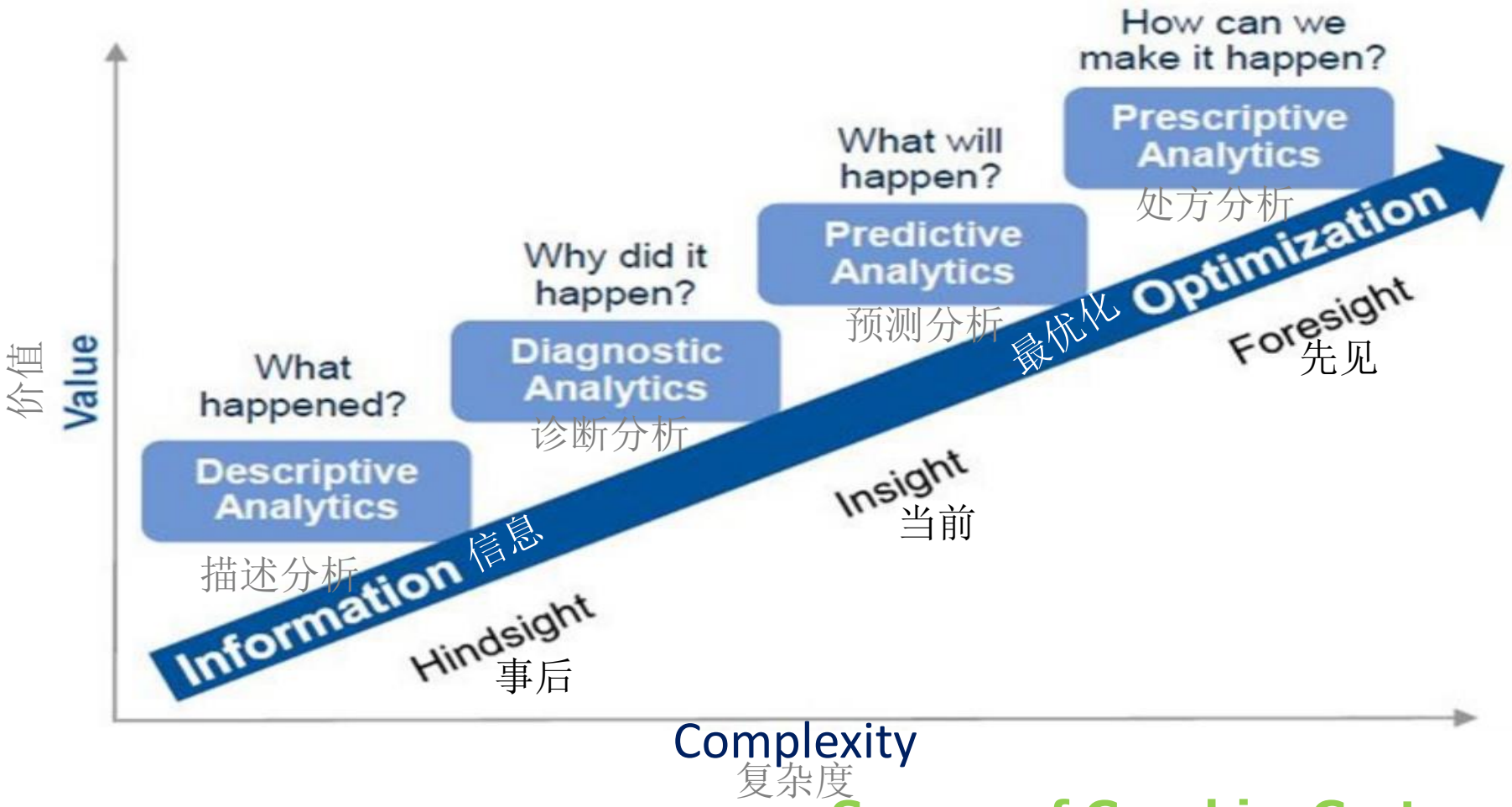
E-Health : Work packages

电子医疗：工作包

Population Health Analytics 人群健康分析

But First: The "Maslow Hierarchy" of Business Analytics

首先："马斯洛分级" 分析



Source of Graphic: Gartner

Tele-medicine - The use of electronic information and communications technologies to provide and support health care when distance separates the participants.应用电子信息系统和通讯科技手段远程提供和辅助医疗服务。

Robotics机器人

Remote Surgery远程手术

Live Monitoring via Cell Phones 手机在线监测

Four Virtual Care Models 四种虚拟医疗模式


© Regenstrieff


© Sony


© Getty Images


© Kaiser Permanente

Live Video Consultation

Synchronous

Saves travel time

Improves access

Convenient

Everyone has to show up at the same time

视频直播诊疗

Store & Forward

Asynchronous, send photo or video

Saves travel time *and* more efficient

Improves access

Convenient

Impersonal

异步存储&发送

Remote Monitoring

Monitor data

Early intervention

Saves travel time *and* more efficient

Convenient

Intrusive

Requires engagement

远程监控

Guided Self Service

Personalized education and guidance

Social networks

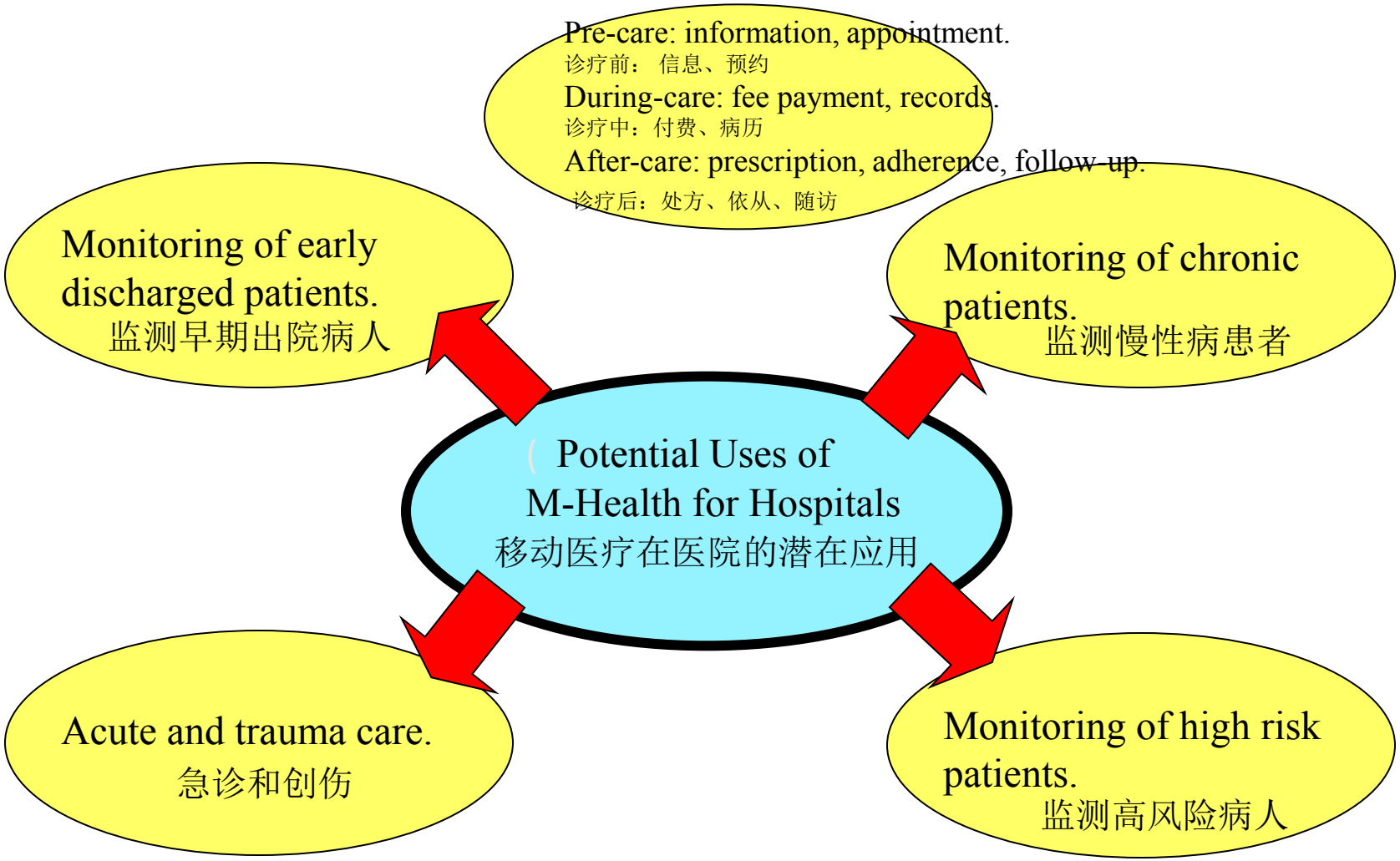
Automated rules-based supervision

Requires engagement

个体指导服务

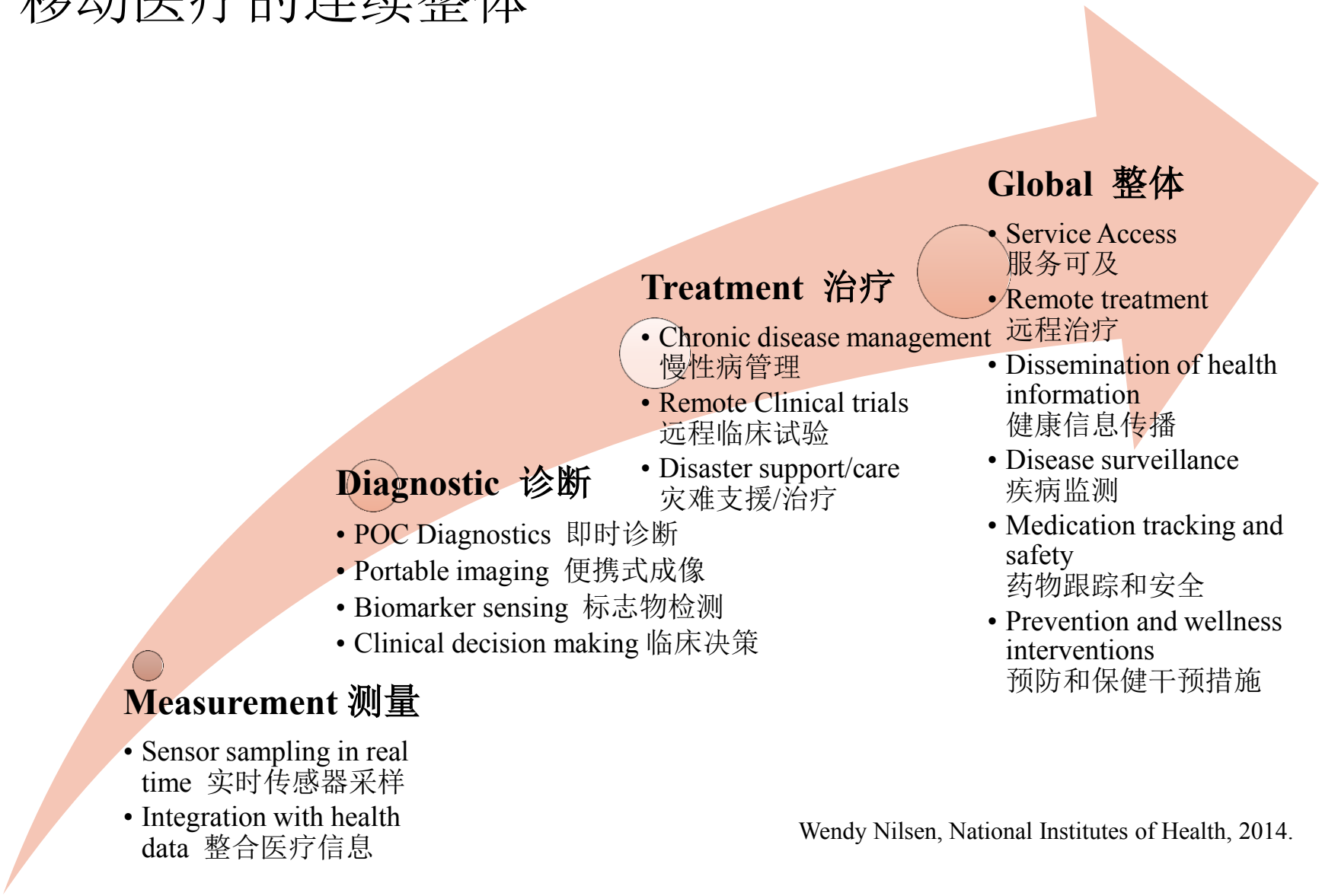
Source: Kaiser Permanente

M-Health and Healthcare Applications 移动医疗和医疗应用



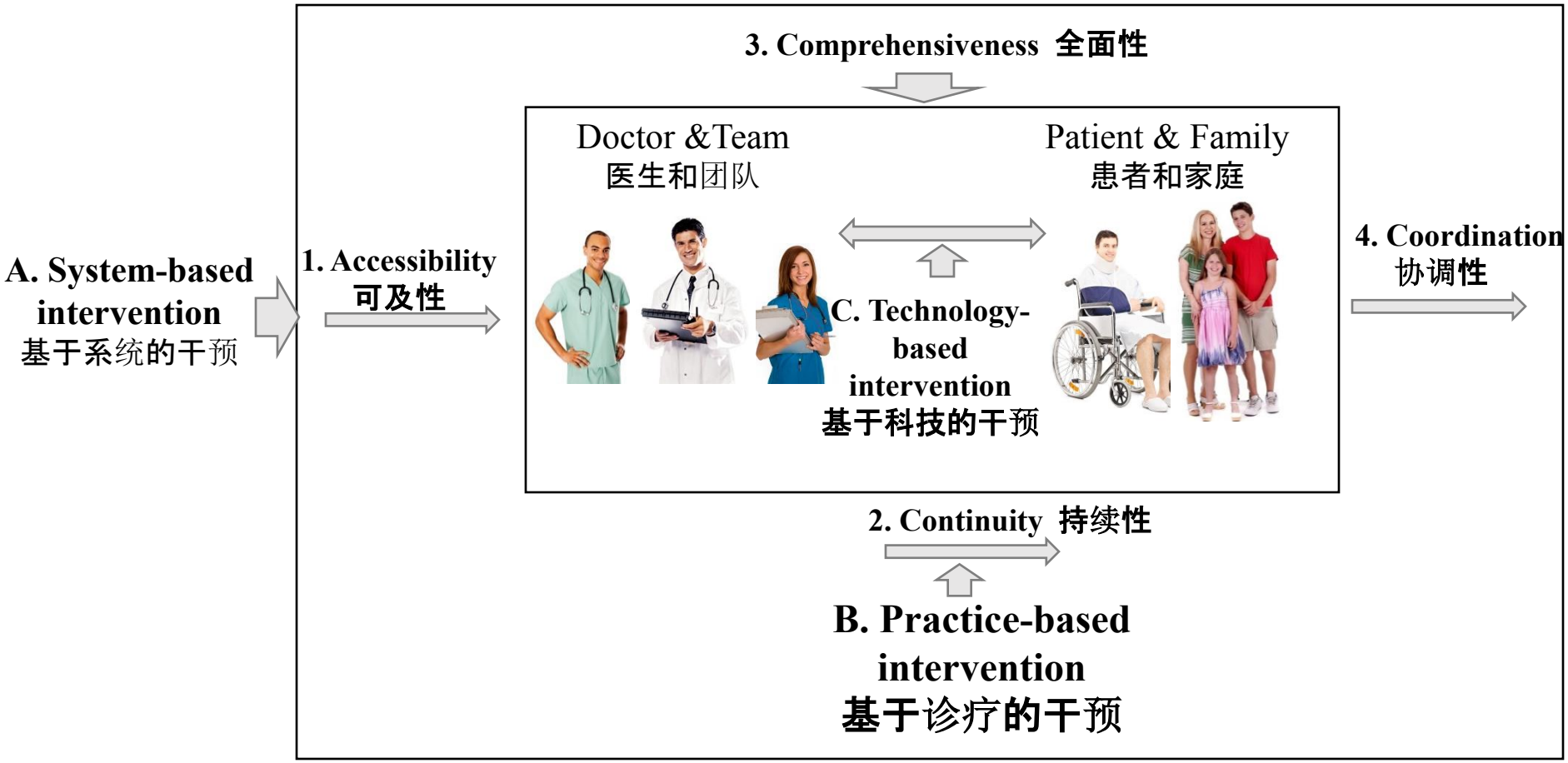
(Primary endpoints: hospital and emergency room admission, mortality. Secondary endpoints: patient quality of life, satisfaction and functional performance, adherence to the treatment, cost analysis, usability) （主要端点：住院和急诊入院，死亡。次要端点：生活质量、满意度和功能表现、患者的依从性、成本分析，可用性）

Continuum of mHealth tools
移动医疗的连续整体



Wendy Nilsen, National Institutes of Health, 2014.

Interventions to Improve Primary Care Performance
提升基本医疗绩效的干预措施



Applications of HTA in Primary Care
卫生技术评估在基本医疗上的应用

- Based on the objectives of healthcare, applications of HTA in primary care include:
  依据医疗目标，卫生技术评估用于基本医疗包括：
  - ➢prevention 预防
  - ➢screening 筛查
  - ➢diagnosis 诊断
  - ➢treatment 治疗
  - ➢rehabilitation 康复
  - ➢Palliation 缓解
  - ➢Assessment评估

HTA for Prevention in Primary Care
卫生技术评估在预防项目上的应用

- The **purpose of prevention** is to protect against disease by preventing it from occurring, reducing the risk of its occurrence, or limiting its extent or sequelae. 预防的目的是防止发生疾病，降低其发生的可能，或限制其发生的程度或影响。

HTA for Prevention in Primary Care (Cont'd)
卫生技术评估在预防项目上的应用

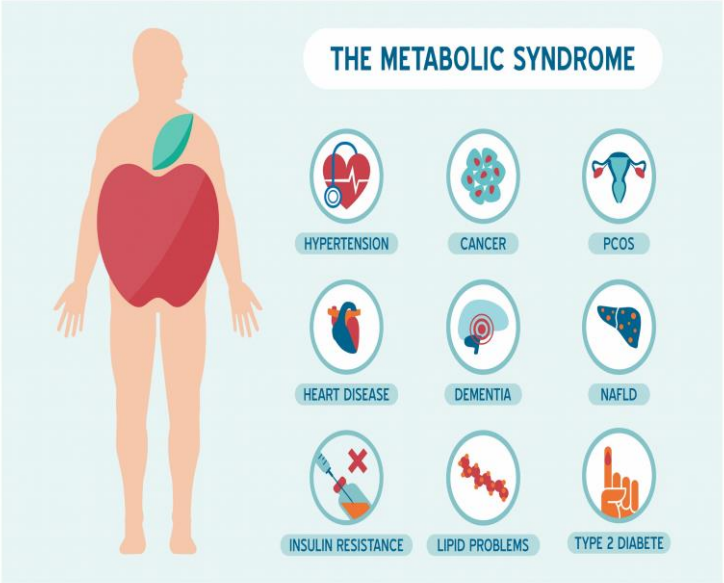
One important application of HTA in primary care is to improve the allocation of resources in the field of **vaccines**.卫生技术评估在基本医疗上的一项重要应用是改进疫苗领域的资源配置。

- HPV vaccination in females and males (La Torre 2010; Thiry et al. 2007), HPV疫苗
- meningococcal vaccine (Tu et al. 2014), 脑膜炎球菌疫苗
- pneumococcal vaccine for infant and children (Boonacker et al. 2011; Antony et al. 2005), 肺炎球菌疫苗
- varicella vaccine (New Zealand National Health Committee 2012), 水痘疫苗
- rotavirus vaccine (Imaz et al. 2014), 轮状病毒疫苗
- herpes zoster vaccine (van Hoek et al. 2012). 带状疱疹疫苗

HTA for Prevention in Primary Care
卫生技术评估在预防项目上的应用

HTA are also performed for other public health preventive services, such as卫生技术评估也用于其它公共卫生预防服务，例如

- evaluations for oral disease prevention (Petersen and Kwan 2004); 口腔疾病预防评估
- cardiovascular diseases and the metabolic syndrome prevention (Korczak et al. 2011); 心血管疾病和代谢综合征预防
- programs for reducing obesity and related chronic disease risk in children and youth (Flynn et al. 2006). 减少儿童和青少年肥胖和相关慢性疾病风险的项目

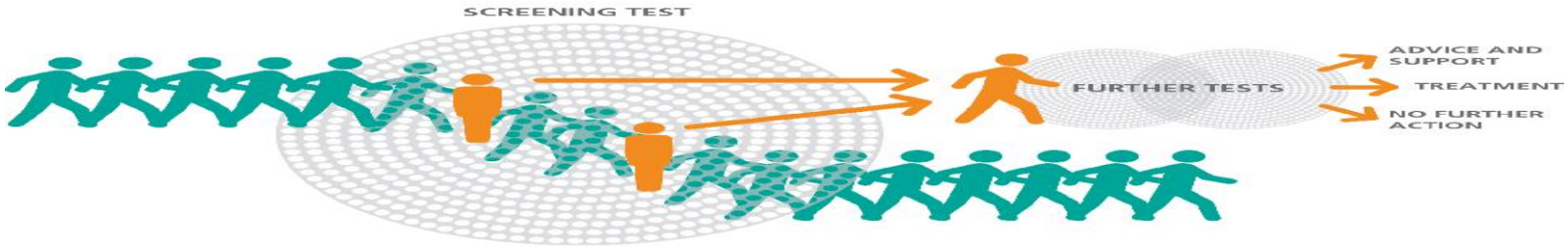


HTA for Screening in Primary Care
卫生技术评估在筛查项目上的应用

- **Screening** for a disease/condition aims at taking care of patients as soon as possible, and especially at offering early appropriate treatments, with the hope of reducing both the individual and social burden of the disease.
筛查旨在尽快对患者提供早期适当的治疗，以减少疾病的个人和社会负担。

HTA for Screening in Primary Care
卫生技术评估在筛查项目上的应用

- Examples of HTA for screening: 应用项目例举
  - screening for alcohol abuse (Watson et al. 2013) 酗酒筛查
  - breast cancer (Banta and Oortwiin 2001; Gartlehner et al. 2013) 乳腺癌筛查
  - colon cancer (Hewitson et al. 2007) 结肠癌筛查
  - prostate cancer (Banta and Oortwiin 2001; Norderhaug 2003). 前列腺癌筛查
  - screening with ultrasound examination for women during pregnancy (Banta and Oortwiin 2001; Whitworth et al. 2010) 孕期超声检查
  - phenylketonuria screening for all newborns (Seymour et al. 1997) 新生儿尿症筛查



HTA for Screening in Primary Care
卫生技术评估在筛查项目上的应用

The principal factors to consider in HTA in determining the appropriateness of population screening include: 在确定人口筛选的适当性时，HTA要考虑的主要因素包括

- a) the burden of suffering from the target condition (e.g., incidence and prevalence of disease, mortality, morbidity, costs of care); 疾病负担
- b) the accuracy of the screening test (e.g., sensitivity, specificity) in detecting early-stage disease; 筛查试验的准确性
- c) the effectiveness of early detection in improving outcomes and the trade-off between benefits and potential harms; 利益与潜在危害之间的权衡
- d) resource constraints (e.g., cost-effectiveness); 资源限制
- e) the ability of clinicians, patients, and the healthcare system to implement a screening program (e.g., feasibility, acceptability, uptake, patient education, adherence, follow-up); 可行性
- f) philosophical and moral objections; 伦理学
- g) opportunity costs (e.g., if screening displaces resources needed for other, perhaps more effective, healthcare services) . 机会成本

HTA for Diagnosis in Primary Care
卫生技术评估在诊断项目上的应用

- The purpose of a diagnostic test is to provide information on the presence or absence of a disease.

  诊断的目的是提供患有或不患有某种疾病的依据

A test can create value in three areas:

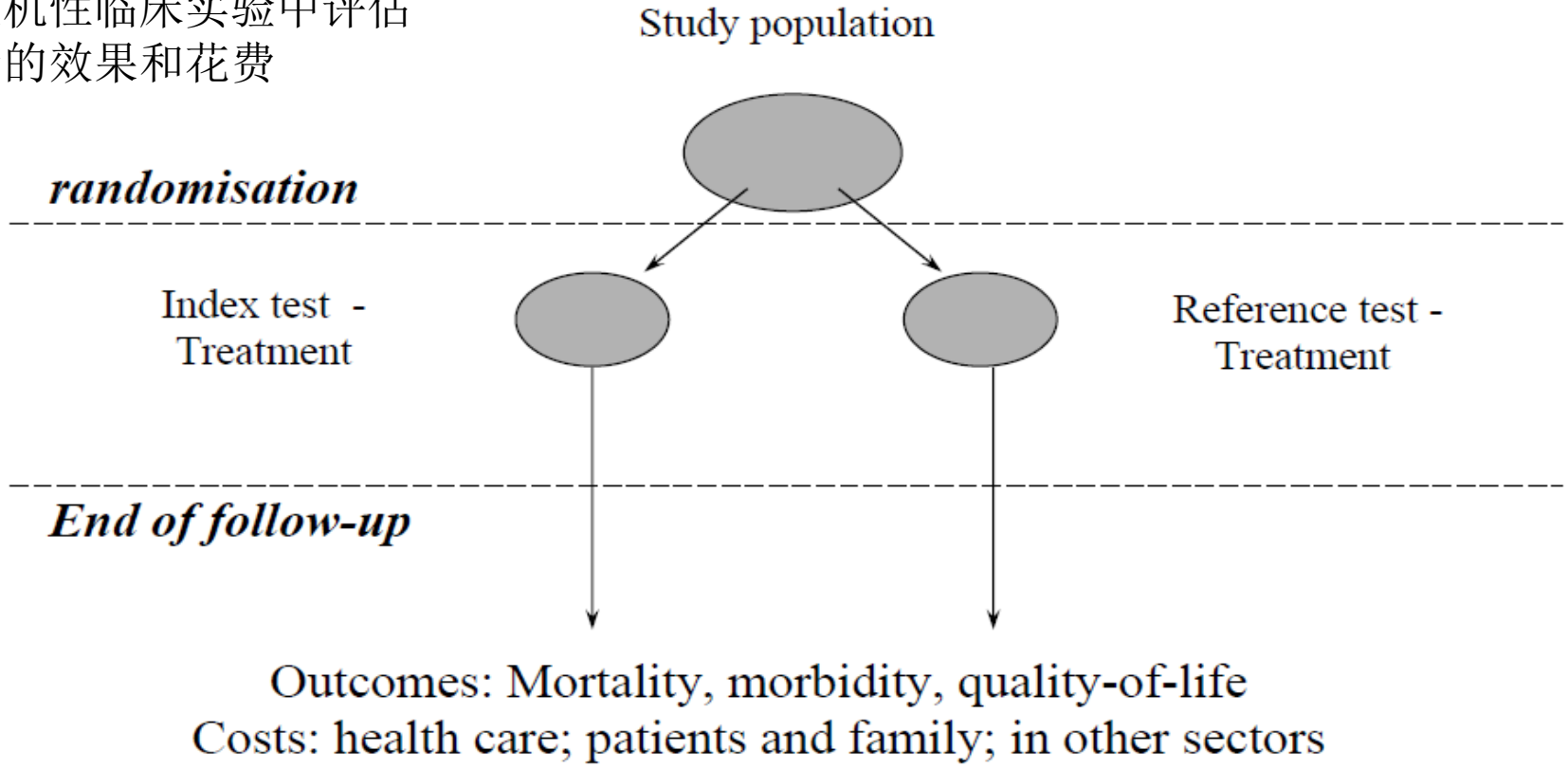
诊断测试可以在三个方面创造价值

- medical (to inform clinical treatment); 医疗
- planning (to inform patients' choices on reproduction, work, retirement, long-term health, financial plans, etc.); 规划
- psychic value (directly changing patients' sense of satisfaction for both positive or negative value). 心理价值

HTA for Diagnosis in Primary Care
卫生技术评估在诊断项目上的应用

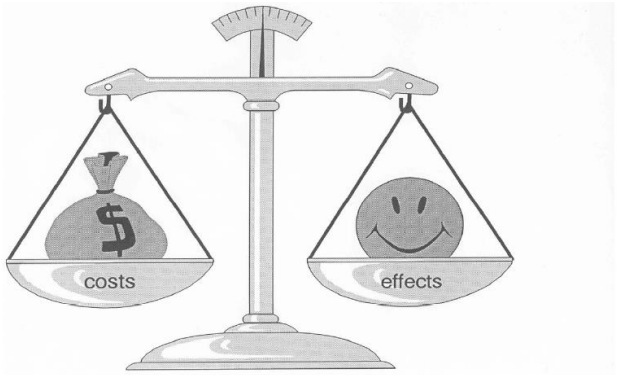
Assessment of effects and costs of diagnosis and treatment in randomised clincial trials

在随机性临床实验中评估
诊断的效果和花费



HTA for Diagnosis in Primary Care
卫生技术评估在诊断项目上的应用

- Diagnostic technologies need to demonstrate their
  衡量诊断技术
  - Efficacy: how well something works in a controlled situation 效率
  - Effectiveness: how well something works in a population or real setting 效果
- A chain of inquiry that leads from the technical capacity of a diagnosis test to changes in patient health outcomes to cost-effectiveness: 一系列对诊断的技术能力、健康效果和成本效益的衡量：
  - technical aspects: reliable and precise, accurate, operator dependence, feasibility and acceptability, interference and cross-reactivity, inter-and intra-observer reliability;技术方面
  - diagnostic accuracy: validity and the “gold standard”;诊断准确性
  - diagnostic thinking;诊断思维
  - therapeutic effectiveness;效果
  - patient outcomes;患者结果
  - societal outcomes.社会效果



HTA for Treatment in Primary Care
卫生技术评估在治疗项目上的应用

- Treatment intended to improve or maintain health status or avoid further deterioration (e.g., antiviral therapy, prescription for drug addiction, psychotherapy).治疗旨在改善或维持健康状况或避免进一步恶化。

- The impacts of most therapeutic technologies on health outcomes can be assessed as direct cause-and-effect relationships between interventions and outcomes. 大多数治疗技术对健康结果的影响可以通过衡量干预和结果之间的直接因果关系进行评估。

HTA for Treatment in Primary Care
卫生技术评估在治疗项目上的应用

Examples of HTA on therapeutic approaches in primary care: 举例

- drugs (e.g., aspirin, beta-blockers, antibiotics, cancer chemotherapy) (Faria et al. 2013; Chaudhary et al. 2015) 药物
- biologics (Gulacsi 2010) 生物制剂
- devices, equipment and supplies (e.g., cardiac pacemaker) (Ricci et al. 2015) 设备及用品
- medical procedures (Health Quality Ontario 2016; Ernst et al. 2011; Priebe et al. 2016) 手术

HTA for Treatment in Primary Care
卫生技术评估在治疗项目上的应用

For therapeutic approaches, HTAs inquire about the intended consequences as well as unintended ones.
对预期的后果以及非预期的后果的评估

Take HTA for antibiotics as an example: 以抗生素为例

- The intended use of antibiotics is kill or inhibit growth of bacteria that cause infectious disease, which has been evaluated by multiple HTAs (Logman et al. 2010; Selva et al. 2015). 预期用途：抑制病菌
- There were also HTAs conducted for assessing the unintended consequences or unanticipated uses of antibiotics, which included overuse and improper use that led to multi-drug resistant bacterial strains (Venekamp et al. 2016). 不良后果：
- 抵制多种药物的病菌

HTA for Rehabilitation in Primary Care
卫生技术评估在康复项目上的应用

- **Rehabilitation** includes restore, maintain or improve a physically or mentally disabled person‘s function and well-being (e.g., exercise program for post-stroke patients, assistive device for severe speech impairment). 康复包括恢复、维持或改善身体或精神疾病患者的功能和健康。

HTA for Rehabilitation in Primary Care
卫生技术评估在康复项目上的应用

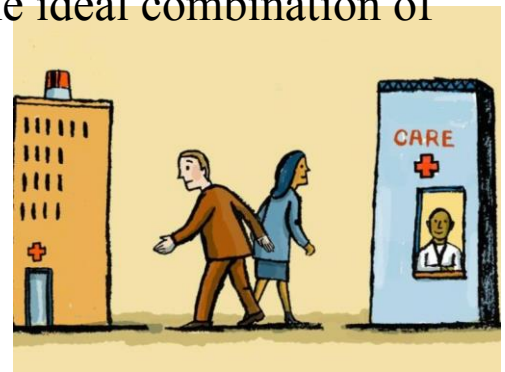
Types of HTA for Rehabilitation and Examples: 举例

- From patient & community perspectives: 患者和社区层面
  - An evaluation from a randomized trial indicated that cardiac rehabilitation is cost-effective from a community perspective and highly cost-effective from the perspective of patients (Oldridge et al. 2008). 临床随机试验评估心脏康复在社区和患者层面的成本效益

HTA for Rehabilitation in Primary Care
卫生技术评估在康复项目上的应用

Types of HTA for Rehabilitation and Examples:举例

- Comparing effectiveness of rehabilitation interventions performed between inpatient and outpatient settings: 比较不同医疗机构康复项目的有效性
  - A randomized trial of community versus hospital pulmonary rehabilitation found both settings produced significant improvements in terms of exercise capacity and quality of life after long-term follow-up. The choice of model will depend on local factors of convenience, existing availability of resources and incremental costs (Waterhouse et al. 2010)
    社区和医院针对患者肺部康复的干预效果
  - A systematic review and meta-analysis of randomized controlled trials in a variety of settings indicated that a single rehabilitation service may not provide health economic benefits for all patient groups and situations, the ideal combination of rehabilitation services related to cost-effectiveness
  - (Brusco et al. 2014). 单一服务和组合服务的对比



HTA for Palliation in Primary Care
卫生技术评估在缓解项目上的应用

- **Palliation** aims to improve the quality of life of patients, particularly for relief of pain, symptoms, discomfort, and stress of serious illness, as well as psychological, social, and spiritual problems. 缓解旨在提高患者的生活质量，特别是缓解疼痛，症状，不适和严重疾病的压力，以及心理，社会和精神问题。

HTA for Palliation in Primary Care
卫生技术评估在缓解项目上的应用

Types of HTAs for palliation:举例

- HTAs for palliation often provide for progressive, incurable disease, e.g., palliative therapies for patients with inoperable oesophageal cancer (Shenfine et al. 2005), and palliative chemotherapy for patients with advanced breast cancer pretreated with anthracyclines and taxanes (Oostendorp et al. 2011).
- 对于不能手术的食管癌患者的舒缓治疗，以及对晚期乳腺癌患者的舒缓化疗的评估

- HTAs for palliation can be provided at any point in illness and with treatment, e.g., patient-controlled analgesia (McDaid et al. 2010).舒缓的评估也应用于疾病和治疗的任何阶段，如针对镇痛的评估

HTA for Assessment in Primary Care 卫生技术评估在预防项目上的应用PCMH Accreditation Criteria 以患者为中心的医疗之家的认证标准

- **PCMH1: Patient-Centered Access** 以患者为中心的可及性

Appointment Access预约可及性; **24/7 Access to Clinical Advice全天候临床咨询;**

Electronic Access电子信息访问的可及性

- **PCMH2: Team-Based Care**团队医疗

Continuity连续性; Medical Home Responsibilities医疗之家责任;

Culturally and Linguistically Appropriate Services适当的文化和语言服务;

The Practice Team 诊疗团队

PCMH3: Population Health Management 人群健康管理

Patient Information患者信息; **Clinical Data**临床数据;

Comprehensive Health Assessment综合健康评估;

Use Data for Population Management使用数据进行人口管理;

Implement Evidence-Based Decision Support 实施循证决策支持

HTA for Assessment in Primary Care 卫生技术评估在预防项目上的应用
PCMH Accreditation Criteria 以患者为中心的医疗之家的认证标准

- **PCMH4: Care Management and Support 医疗管理和支持**

Identify Patients for Care Management 识别患者

Care Planning and Self-Care Support 护理计划和自我护理支持

Medication Management 药物治疗管理

Use Electronic Prescribing 使用电子处方

Support Self-Care and Shared Decision Making 支持自我护理和共同决策

- **PCMH5: Care Coordination and Care Transitions 医疗服务协调和服务转换**

Test Tracking and Follow-Up 测试追踪跟进

Referral Tracking and Follow-Up 转诊追踪跟进

Coordinate Care Transitions 协调医疗转换

- **PCMH6: Performance Measurement and Quality Improvement 绩效测量和质量改进**

Measure Clinical Quality Performance临床质量绩效测量 Measure Resource Use and Care Coordination资源使用和协调的测量 Measure Patient/Family Experience患者/家庭医疗体验的测量

Implement Continuous Quality Improvement 持续性质量改进

Demonstrate Continuous Quality Improvement 持续性质量改进的证明

Report Performance 汇报绩效

Use Certified EHR Technology 使用认证的电子病历技术

Johns Hopkins Primary Care Policy Center
PCAT (Primary Care Assessment Tools)

美国约翰霍普金斯大学基本医疗政策中心医疗评估工具各个版本

- ***PCAT Versions　版本***
- PCAT – Adult (expanded and short version)　成人版（长，短版）
- PCAT – Child (expanded and short version)　儿童版（长，短版）
- PCAT – Provider (standard version)　医师版
- PCAT – Facility (standard version)　机构版
- PCAT – System (standard version)　体系版
- ***PCAT Language　语言***
- English, Spanish, Chinese, Korean　英语、西班牙语、中文、韩语
- ***Countries that Have Used PCAT or Planning to Use PCAT　国家和地区***
- US, Canada, Spain, China, Taiwan, Brazil, South Korea　美国、加拿大、西班牙 中国、台湾、巴西、韩国
- Indonesia, Japan, Jordan, South Africa, Turkey　印尼、日本、约旦、南非、土耳其
- ***Known Journal Articles Using PCAT:*** 100+　使用PCAT发表的论文：100+

Website of Johns Hopkins Primary Care Policy Center: http://www.jhsph.edu/pcpc/pca_tools.html

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