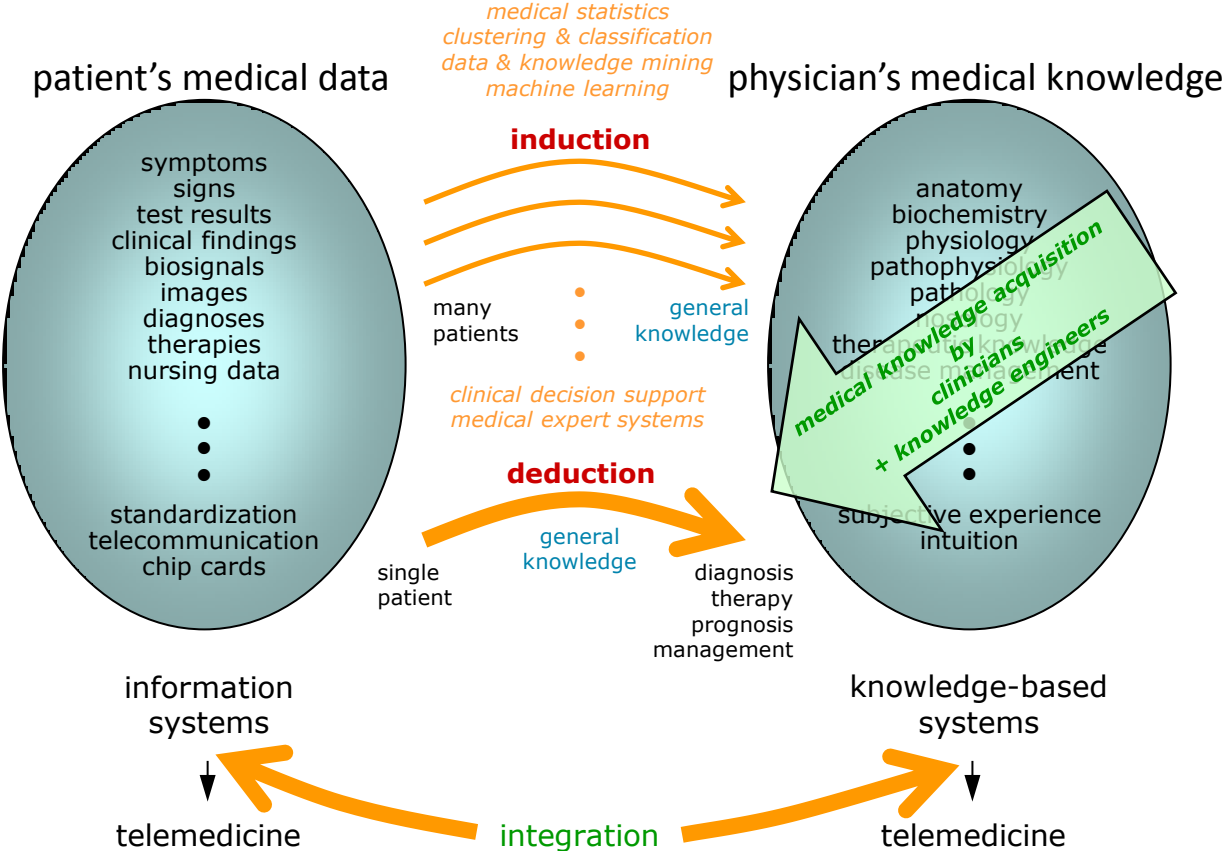


EHRs and clinical decision support through knowledge-based systems



Clinical decision support for patient safety and quality assurance

patients' structured medical data: EHRs (local, national), Apps, ...



<p>diagnostic support</p> <ul style="list-style-type: none">• alerts, reminders, to-do lists• clinical interpretation, (tele)monitoring• differential diagnostics<ul style="list-style-type: none">– rare diseases, rare syndromes– further or redundant examinations– diagnostic completeness (multi-morbidity)• consensus-criteria-based evaluations<ul style="list-style-type: none">– disease classification and surveillance criteria	<p>therapy advice</p> <ul style="list-style-type: none">• drug alerts, reminders, calculations<ul style="list-style-type: none">– indication, contraindications, redundant medications, substitutions– dosage calculations, drug-drug interactions, adverse drug events• management of antimicrobial therapies, susceptibility and resistance rates• open- and closed-loop control systems
<p>prognostic prediction</p> <ul style="list-style-type: none">• illness severity scores, prediction rules• trend detection and visualization	<p>hospital management and quality benchmarking</p> <ul style="list-style-type: none">• evidence-based reminders and processes• computerized clinical guidelines, protocols, standard operating procedures• healthcare-associated infection surveillance



structured medical knowledge: rules, tables, trees, guidelines, scores, algorithms, ...)

FIRST, DO NO HARM

TO ERR IS HUMAN

BUILDING A SAFER HEALTH SYSTEM

I N S T I T U T E O F M E D I C I N E

- studies in Colorado and Utah and in New York (1997)
 - errors in the delivery of health care leading to the death of as many as 98,000 US citizens annually
- causes of errors
 - error or delay in diagnosis
 - failure to order indicated tests
 - use of outdated tests or therapy
 - failure to act on results of testing or monitoring
 - error in the performance of a test, procedure, or operation
 - error in administering the treatment
 - error in the dose or method of using a drug
 - avoidable delay in treatment or in responding to an abnormal test
 - failure to provide (indicated) care
 - failure in communication
 - equipment failure
- prevention of errors
 - we must systematically design safety into processes of care