The power of clinical informatics: A primer for medical students

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If you’re like most people in the health care world, a daily stop in your media diet is a check on the latest figures on case counts, hospitalizations, test-positivity rates and other COVID-19 data points in your area. The use of such data to drive public health response is just one example of the power of organized health care information to help improve care delivery and patient outcomes.

The data collected in the health care setting, most frequently found in electronic health records (EHRs), can be a forceful tool in improving the quality of care and generating more positive health outcomes.

But how do you use the data to foster better results? Clinical informatics brings together the people, data and technology to study, organize and communicate the information in meaningful ways in the clinical setting.

A new education module offered via the AMA Ed Hub™ helps medical students—and residents and physicians who may not have received such training—understand the major terminology used in clinical informatics and related topics. It also describes for learners the role clinical informatics plays in clinical health care delivery, discusses supplemental ways clinical data is used and explains how clinical informatics informs the use of technology in health care.

The free online education module “How Clinical Informatics Impacts Health Care Delivery” is one of 13 modules released as part of the Health Systems Science Learning Series.

Find out more about how these modules offer medical students insight on health systems science.

Informatics’ role in care delivery

Physicians can use informatics to analyze data for a myriad of positive changes: improved overall
health care quality, enhanced workflows, increased productivity, reduced/prevented medical errors, lowered costs, increased administrative efficiencies, improved real-time communication between physicians and other health care professionals, improved patient outcomes and more.

Data comes from places such as EHRs, bed management systems, health information exchanges, personal health records, wearable medical devices and computerized provider order entry.

Here are some examples of how clinical informatics can improve care for diabetic patients.

**Population health.** Pull the hemoglobin A1C numbers for all patients with diabetes. Have these patients received an annual comprehensive foot inspection?

**Health care delivery.** What services are these patients receiving? How many have seen an ophthalmologist in the past year, and who should be referred?

**Quality improvement.** How many patients have met their A1C goal? Are there common factors or barriers that can be addressed at a population level?

**Patient safety.** Are there any factors conducive to medical errors in this population? Did all of our patients with diabetes receive the flu vaccine? How many of our patients hospitalized with the flu missed getting vaccinated at an office visit?

**Research.** What can we learn from the data? Are some treatments more effective than others?

**Personal health.** Is a given patient using an app to track food, sleep, activity or other behaviors? How much activity is this patient getting? Is this a cause of poor health or the result? Are there lifestyle goals we can set?

Learn about online lectures that make teaching informatics easier during COVID-19.

### Diving into data

Data analytics allows for three levels of analysis:

- **Descriptive:** Standard reporting describing current situations and problems.
- **Predictive:** Simulation and modeling techniques identifying trends and suggesting outcomes of actions taken.
- **Prescriptive:** Optimizing clinical, financial and other outcomes.

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Beyond the EHR, evidence-based medicine—which includes the proper phrasing for clinical questions and seeking the best evidence or medical knowledge to answer those questions—as well as telemedicine and telehealth are additional important applications of clinical informatics.

More study help

The AMA also has released the second edition of the *Health Systems Science* textbook, published by Elsevier, which is a framework for this third pillar of medical education.

Health systems science is defined as the understanding of how health care is delivered, how health care professionals work together to deliver that care, and how the health system can improve patient care and health care delivery. *Health Systems Science Review* was published last year. Both books are available for purchase from the AMA Store.