Dental informatics—combines the use of computers with dentistry

- Eighty-five percent of dental offices make some use of computers.

Special purpose applications: education

- Computer-generated treatment plans to educate patients.
- Simulations for training dentists
  - Virtual dentist’s office

Administrative applications

- Electronic appointment book, electronic accounting software, dental record
- Electronic dental chart
  - Standardized, easy to search, and easy to read. It will integrate practice management tasks (administrative applications) with clinical information.

The effects of changing demographics on dentistry

- Combination of an aging population who keep their teeth and children whose teeth are cared for means dentists are filling fewer cavities in children; they are treating older patients who have different dental problems.
- Despite the general improvement in dental health, there is an epidemic of decay among poor children.

Clinical applications

- Computerized instruments
  - Fiber-optic camera
  - Ultrasonic instruments used in endodontics (treats diseases of the pulp)
  - Electronic probe used in periodontics (treats diseases of the gums)
  - Lasers and digital cameras in cosmetic dentistry
  - WAND™ includes a microprocessor that measures tissue density; this insures a steady flow of anesthetic.

- Endodontics treats diseases of the pulp.
- Periodontics treats diseases of the gums.

- Periodontal disease is caused by bacteria.
  - Sequence of the genome associated with the pathogen causing gum disease has been identified.
  - Gum disease is related to heart disease, premature birth, cancer, and diabetes.
  - Voice-activated charting is beginning to be used.
• **Cosmetic dentistry uses bonding, implants, orthodonture, and virtual reality images.**

• **Diagnosis**
  - Expert systems or clinical decision-support systems (EXPERTMD) and online databases
  - X-rays
  - Digital X-rays (less radiation, immediately developed, and seen on a monitor)
  - Electrical conductance
  - Light illumination
  - *Fiber-optic transillumination*
  - DIFOTI®
  - *Intra-oral fiber-optic cameras*

• **Lasers**—depending on the wavelength of the light, lasers can do different things: drill teeth, reshape gums, whiten teeth

• **Minimally invasive dentistry**—emphasis on prevention

• **Surgery**
  - The newest techniques use interventional radiology: radiosurgery is a technique that uses radio waves instead of knives. It is used for the following procedures: cosmetic surgery (to heat bleaching agents), gum surgery, root canal therapy, the removal of a muscle that grows between the two front teeth, and biopsies.

• The growth of specialization—the percent of dentists who are specialists is expected to rise.

• Teledentistry allows dentists to consult with other dentists, specialists.