History of Dental Materials
DENTAL MATERIALS I

Unit I

Introduction to Dental Materials
Introduction
A Comprehensive Science

- Not always traceable to place/date
- Properties & manipulation
- Reserved for mechanical dentistry
- (restorations & fabricated appliances)
- Biological aspect refers to:
- Interaction in oral environment
History of Dental Materials

- Phoenicians/Egyptians 3150 BC
- “tooth worms”
- Used gold for appliances
- Today: crowns, bridges or foils

- Chinese 2700 BC
- Silver amalgam first used China
- porcelain discovered in 1295 AD
History of Dental Materials

- **Etruscans 6th Century BC**
  - gold and teeth from oxen/calves for appliances

- **Romans 166-201 AD**
  - Skilled in manipulating gold
  - Very hygienic-cleaning powders
  - Tooth picks-wood, metal, gold
History of Dental Materials

- Italy-Marko Polo 1295 AD
- Trial & error-slow, wasteful
- brought porcelain to Europe in 13th century
HISTORY OF DENTAL MATERIALS

- France – Pierre Fauchard (MD) 1728
- Paris – “cradle of modern dentistry” DDS
- Dentures with ivory
- Killed “toothworm” theory
- Developed straight dental chair
HISTORY OF DENTAL MATERIALS

• France – M. Taveau 1826
• Silver paste introduced to Paris
• Crowcaur brothers in NYC in 1830
• Royal Mineral Succedaneum

*** in the US, the Amalgam War began in 1835 and lasted 2 decades
HISTORY OF DENTAL MATERIALS

- USA - PAUL REVERE 1750-1810
  - Silversmith/dentist
  - Impressions from plaster cast
  - Forensic dentistry

- John Greenwood 1785
  - George Washington’s dentist
HISTORY OF DENTAL MATERIALS

- USA – G.V. Black 1895
- Research and study of dental materials still in effect today
- “Grand Old Man of Dentistry”
- Developed machines to test alloys, materials & instruments
- Wrote many texts
- “extension for prevention doctrine”
HISTORY OF DENTAL MATERIALS

• National Bureau of Standards 1919
• Science of dental materials placed under supervision
• A systematic study developed
• Now: National Institute for Standards and Technology
• Materials tested extensively in labs
Importance to Auxiliaries

- selection criteria part of professional knowledge
- ease of use, manipulation & knowledge of effects
- upgrades continual
- time saving steps
- improved clean up techniques
- = work is easier
- a required course for all dental students
  -- depth/scope
Importance to Auxiliaries

Dental Assistant  CDA/RDA

- materials training for materials used
- proper mix & consistency for success
- success - directly related to manipulation
- must know properties - setting time
- probable usefulness
- strength, oral attack, wet/dry placement and longevity
Importance to Auxiliaries

Expanded Function Dental Assistant EFDA

• requires broader knowledge
• performs selected restorative procedures
• requires comprehension associated with placing, finishing materials
Importance to Auxiliaries

• EFDA-Expanded Functions Dental Assistant

Additional duties

Additions all the time

  - Soft reline
  - Sealants
  - Whitening
Importance to Auxiliaries

Dental Hygienist RDH

- does not always handle materials directly
- recognize material
- must know ingredients
- must know strengths & weaknesses
- prophylaxis concerns: ex: porcelain laminates
- Restorative duties now
Importance to Auxiliaries

What to know about dental materials:

• why a material is used
• how to handled
• what happens with deviations
• what finished product should accomplish
• prognosis - how long it should last
Specifications & Regulations

• 1928 ADA and US government jointly sponsored research and formed **The National Bureau of Standards**

• Science of dental materials was placed under its supervision.

• Materials tested extensively in labs.

• ADA specifications came from these investigations

• covers thousands of materials today.
Specifications & Regulations

• ADA tests mechanical, physical & chemical properties
• ensures their safety, quality & usefulness
• manufacturers can submit new products to the ADA Seal Program
Specifications & Regulations

- materials testing may take years for consistent data and $$$
- specifications & standards are set
- ADA Seal of Acceptance is awarded
- ADA Council on Dental Materials, Instruments and Equipment publishes a listing of all certified materials in JADA
Specifications & Regulations

ISO - International Standards Organization

- foreign equivalent of ADA that specifies and guides standards from 51 countries

FDI - Federation Dentaire International

- Australia
Specifications & Regulations

FDA- Food and Drug Administration

• Food and Drug Act 1906 amended in 1976
• gave FDA regulatory jurisdiction over safety & competence of medical & dental devices.
• includes OTC to public: tooth pastes, whiteners, rinses
• safety of dental materials- primary concern
Specifications & Regulations

• CDC – sterilization, disinfection, barrier techniques

• knowledgeable personnel handling materials
Specifications & Regulations

EPA

• tracks and regulates dental waste disposal
  – solids, liquids and gases
• sharps: needles, syringes, ortho wires
• heavy toxic metals - mercury
• x-ray fixer and lead foil
• always changing - must stay current
Occupational Safety

OSHA (state and federal agencies)

- formulates and enforces provisions that ensure safe working condition

Employee Safety

- Any dentist who employs a staff is subject to same occupational health and safety regulations as any other business or industry

ADA Regulatory Compliance Manual

- has training aids to help staff/dentist
Occupational Safety

MSDS

• Material Safety Data Sheets
• provided by the manufacturer
• contains specific information about the material
  – manufacturer name & phone #, product name, hazardous ingredients, health precautions, reactivity data, fire hazards, emergency procedures, safe handling info, and how to clean up a spill.