

## Dental Care Delivery

Network = professional associations, government agencies, private sector (3<sup>rd</sup> party entities, foundations, advocacy groups)

Organized Dentistry:

- ADA – tripartite, provides consumer info, research/product testing, membership services, political action
- Hispanic dental association
- National dental association
- Society of American Indian dentists
- Speciality organizations – periodontology, flying dentists, pet dentistry, toothfriendly international
  - Practice management, technique focussed, study clubs, etc
- Other associations – ADEA, American association for dental research, FDI world dental federation, WHO, etc
- Federal agencies – department of health and human services (Medicaid, medicare, CDC, USPHS), military, etc
- State agencies – department of health, department of human services, board of dentistry, SoD
- Other relationships – insurance, health systems (PPO, HMO, etc), Foundations, patient advocacy, etc

Structure – patient/provider connection, environment of dent practice, dent public health (prevention/control, education, etc)  
– aka, oral health delivery system

- Control vs responsibility (fees, course of treatment, patient selection, staffing/equipment, income, etc)
- Demand of patients
- Career risk management
- Health care reform
- Study reform because of personal importance (career objectives and choices, prof responsibility, life style, etc)
- Shape of future dentistry (access, finance, quality, workforce planning)
- Current structure:
  - private sector delivery – solo/partnerships/groups, HMO/PPO/IPA, managed care umbrella
  - public sector – military/PHS, NHSC/community care programs, migrant health, etc
- Importance of dental benefits – 20mil lost work days, 12mil days of restricted activity, 117K lost school days/100K kids, 6mil disability days, dental disease is chronic but preventable.
- Different than medical diseases – nearly universal, patient have control of seeking care, predictable needs (forecasting/control), not life threatening, begins at childhood, treatment is postponable

Pre-1968 – 90% DDS solo/partnership, direct reimbursement via patient, charity performed and accepted frequently

1960-1980 – escalated demand for care, increased auxiliaries, more complex practice models, increased efficiency, industrialization, increased cost, dental insurance increased, integration with medical system

Today – 60% solo, 15% partnerships, 20% HMO/private organizations, 3<sup>rd</sup> party involvement a major force, more integration with wider health system, larger practices, larger debt load, dual career marriages, marketplace uncertainties

## Brushing and flossing methods

- Bass – periodontal health
- Stillmans – gingival recession/stimulation
- Charter's – ortho/prostodontics
  - o Modified – add a roll to stroke
- Fone's – circular motion for young children/primary teeth
- Spool's – normal flossing
- Loop – tie floss ends together, for children and movement inhibited

## Periodontitis

- Early = 3-4mm deep pockets (1-2mm attachment loss)
- Moderate = 5-7mm deep pockets (4mm attachment loss)
- Advanced = >7mm deep pockets (>5mm attachment loss)

Caries – localized destruction of tooth by high concentration of organic acids produced by bacteria from dietary carbs.

- Bacterial infection transmitted via saliva leading to enamel, dentin, and cementum destruction
- Become infected within hours of birth

Baby bottle tooth decay (early childhood caries) – severe condition of caries, can lead to restorations, extractions, surgery

Accepted caries theory – mineral phase of tooth is dissolved by acid from metabolism of dietary carbs by oral bacteria. Organic phase of enamel and dentin then broken down.

Buffering capacity of saliva:

- 0 = adequate (dentobuff blue)                      normal/good buffer, pH > 6
- 1 = reduced (dentobuff green)                      less than good buffer, pH 4.5-5.5
- 2 = low (dentobuff yellow)                          low buffer, pH < 4

2 layers of carious dentine: infected and affected

- Infected = outer layer, unremineralizable, without sensation (dead)
- Affected = inner layer, minimal bacterial invasion, sensitive (alive)

Evidence based decision making = formalized process and structure for efficient searching to effectively find relevant evidence, and critical appraisal of the evidence to rapidly evaluate and sort out what is valid and useful so that the best scientific evidence is considered when making patient care decisions

- PICO = problem, intervention, comparison, outcome

Leading health indicators selected on basis of

- ability to motivate action
- availability of data to measure progress
- importance as public health issue

Divisions of department of health

- community and family health
- compliance monitoring
- environmental policy
- health policy
- health promotion and chronic disease
- infectious disease epidemiology, prevention, and control
- public health laboratory

University of Minnesota School of Public Health divisions

- biostatistics
- environmental health sciences
- epidemiology and community health
- health policy and management

Prevention goal – 15K children in priority and underserved populations engaged in health behaviours

- reduce childhood obesity, increase early childhood health screening, reduce teen pregnancy

Access Goal – increase access to primary health services for 25K persons in priority populations

- expand community health centers, increase access to publicly funded health insurance programs

### **Core functions of public health: Assessment, Policy Development, Assurance**

Core functions applied to oral health assessment

1. assess oral health status and needs so that problems can be IDed and addressed
2. analyze determinants of IDed oral health needs, including resources
3. assess fluoridation status of water systems and other sources of fluoride
4. implement an oral health surveillance system to ID, investigate, and monitor oral health problems and health hazards

Core functions of applied oral health policy development

1. Develop plans and policies through a collaborative process that supports individual and community oral health efforts to address oral health needs
2. Provide leadership to address oral health problems by maintaining a strong oral health unit within the health agency
3. Mobilize community partnerships between and among policy makers, professionals, organizations, groups, the public, and others to ID and implement solutions to oral health problems

Core functions applied to oral health assurance

1. Inform, educate, and empower the public regarding oral health problems and solutions
2. Promote and enforce laws and regulations that protect and improve oral health, ensure safety, and ensure accountability for the public's wellbeing
3. Link people to needed population based oral health services by enhancing system capacity
4. Support services and implementation of programs that focus on primary and secondary prevention
5. Ensure the public and personal health workforce has the capacity and expertise to address oral health needs effectively
6. Conduct research and support demonstration projects to gain new insights and applications of innovative solutions to oral health problems

Risk factors – an attribute or exposure known to be associated with a health condition, part of a causal chain, brings a person into contact with causal chain, researchers focus on risk factors that can be modified

Reversible index – measuring the presence of a condition that can improve

Irreversible index – measuring a condition that will not change (cumulative index)

### Caries detection

	<b>Pit/fissure lesions</b>	<b>Smooth surface lesions</b>	<b>Interproximal</b>
<b>Visual</b>	Not visible until large	visible	Not visible until large
<b>Explorer</b>	Not detectible until large	detectable	Not detectible
<b>Transillumination</b>	Not detectible	Not detectible	Anterior lesions detectible
<b>Radiographic</b>	Often not visible until large	detectible	Detectible

DMF (decayed, missing, filled) index

- DEF for deciduous teeth
  - o Records dental caries
  - o irreversible, based on surfaces or teeth
  - o does not record size or depth of lesions
  - o assuming missing teeth due to disease
- Limitations
  - o doesn't score teeth filled twice or more, small lesions scored same as large ones, etc
  - o filled and/or component may not be due to caries
  - o sealants may be mistaken as composite restorations
  - o interproximal caries likely undercounted
  - o composite restorations may be undercounted
- DMFt = teeth, out of 28
- DMFs = surfaces, out of 140

ICDAS (international caries detection and assessment system)

- Caries scoring system, risk assessment, framework for caries management decisions
  - o 0 = sound tooth
  - o 1 = first visual change to enamel (cariou opacity) visible after prolonged air drying
  - o 2 = distinct visual change in enamel, even when wet, discolouration wider than natural pit or fissure
  - o 3 = localized enamel breakdown, no visible dentin or underlying shadow
  - o 4 = underlying shadow from dentin with or without enamel breakdown
  - o 5 = distinct cavity with visible dentin
  - o 6 = extensive cavity

Periodontal assessments – probing distance from base of sulcus to gingival margin, measured at 6 points per tooth

- Tooth mobility
  - o 0 = physiologic mobility (<0.5mm B-Li)
  - o 1 = movement 1mm B-Li
  - o 2 = movement 2mm B-Li
  - o 3 = movement >2mm B-Li or depressible in socket
- Furcation involvement
  - o 1 = beginning of furcation detectible
  - o 2 = roof of furcation detectible
  - o 3 = through and through furcation
  - o 4 = supragingival furcation
- Bleeding on Probing measured after each quadrant probed, recorded by circling probing measurement in chart

## O'Leary (PCR) plaque control record

- Plaque disclosing dye used
- 4 surfaces scored per tooth (no binary)
- Surface is scored positive if plaque present regardless of location or amount
- Final score given as ratio of surfaces with plaque to susceptible surfaces available
- Uses illustration of teeth in mouth diagrams
- Advantages – fast, scores all teeth, simple, good for patient education
- Disadvantages – doesn't differentiate between lots and little plaque on given surface → improvement hard to assess

## Greene and Vermillion OHI-S (oral hygiene index simplified)

- Separate debris and calculus components, only 6 representative tooth surfaces scores
  - 3-F, 14-F, 19L, 30L, 8F, 24L
  - If tooth is missing, use next adjacent tooth
- Debris score
  - 0 = no debris or stain
  - 1 = soft debris covers < 1/3 surface
  - 2 = soft debris covers < 2/3 surface
  - 3 = soft debris covers > 2/3 surface
- Calculus score
  - 0 = calculus present
  - 1 = supragingival calculus covers < 1/3 surface
  - 2 = supragingival calculus covers < 2/3 surface or individual flecks of subgingival calculus
  - 3 = supragingival calculus covers > 2/3 surface or continuous band of subgingival calculus
- Advantages – more information than PCR, fast/simple to learn, simplified record keeping, correlates well with periodontal disease
- Disadvantages – not specific enough to follow progress on trouble spots, less value for patient education, interproximal areas not scored, does not score all teeth (loss of accuracy)

## Martens and Meskins PHP-M (personal hygiene performance – modified)

- F and Li surfaces of 6 representative teeth
  1. Most posterior tooth in quadrant 1
  2. Quadrant 1 canine (or lateral incisor)
  3. Quadrant 2 1<sup>st</sup> premolar
  4. Most posterior tooth in quadrant 3
  5. Quadrant 3 canine (or lateral incisor)
  6. Quadrant 4 1<sup>st</sup> premolar
- Score each surface with A, B, C, D, or E
  - A = gingival
  - C = occlusal
  - D = distal
  - E = mesial
- Greater sensitivity if weighted
  - 1 = slight plaque (does not stick to probe)
  - 2 = moderate, <0.5mm, sticks to probe
  - 3 = abundant, >0.5mm, sticks to probe
- Advantages – greater specificity as to location of plaque on any surface, block tabulation allows for rapid interpretation
- Disadvantages – requires training and calibration

### Carter GBI (Gingival bleeding index)

- Floss each contact with double pass, once into each sulcus
- Bleeding noted on floss or within 30 seconds in sulcus
- GBI = bleeding areas / susceptible areas

### Loe GI (gingival index)

- Areas of evaluation – mid facial/lingual to mid papilla, representative spots or all areas of mouth
  - o Typical scoring block
    - 3 MF
    - 8 DL
    - 14 MF
    - 19 DL
    - 24 MF
    - 30 DL
- Expressed as average score over all measured sites
  - o 0 = normal gingiva
  - o 1 = mild inflammation, slight change in colour, slight edema
  - o 2 = moderate inflammation, redness, edema
  - o 3 = severe inflammation, marked redness and edema, tendency to spontaneous bleeding
- Advantages – fast, simple to learn, severity of inflammation scored as opposed to mere presence
- Disadvantages – subjectivity makes comparisons over time and between evaluators less reliable

### CIPTN (community periodontal index of treatment needs)

- Mouth divided into 6 quadrants
  - o 0 = healthy gingiva
  - o 1 = bleeding after gentle probing (special probe)
  - o 2 = calculus or overhangs, pockets < 3.5mm
  - o 3 = pockets 4-6mm
  - o 4 = pockets > 6mm
- Treatment need categories
  - o 0 = no treatment
  - o I = oral hygiene instruction (1)
  - o II = OHI and scaling (2, 3)
  - o III = OHI, scaling, complex treatment (4)
- Advantages – fast, simple to learn, special probe reduces variability, internationally accepted for oral health surveys
- Disadvantages – requires special probe, index teeth may not be representative, does not include attachment loss

OSHA/MNOSHA – occupation safety and health admin

- KERTKA – MN employee right to know act
- Inspections
- Good faith effort
- Protecting you, not patients

CDC – recommendation for Dent (1985, 1993, 2003) – sets DDS standards of care

EPA – environmental (amalgam, disinfectants) – federal, state, and local

Rules:

- OSHA bloodborne pathogens standard (BBP standard)
- CDC infection control recommendations
- MN MERTKA issues
- UMN SoD policies

Transmission:

- Direct contact
- Indirect contact
- Mucosal contact
- Inhalation

Precaution

- Handwash
- Gloves, eyewear, gown (PPE)
- Injury prevention
- Cleansing/sterilize equipment
- Disinfect surfaces

Exposure prevention

- Engineering controls – isolate/remove hazard (physical)
- Work practice controls – change manner of performing tasks (behavioural)
- Administrative controls – policy (before engineering controls for airborne pathogens)
  - o ~90K patients/year die from healthcare acquired infections

Medical waste – not infectious, goes in trashcan

- Modified – sharps, red bag
- Treated to EPA regulations – autoclave and incinerate
- Clean surfaces with EPA registered tuberculocide (hospital grade disinfectant)

Diversity – people of colour will be 54% of US population by 2050

- Estimated by 2030 that minority population will exceed majority population at each age range
- Minority growth = 62% of total population gain since 2000
- Minnesota's minority population 8<sup>th</sup> highest in USA (twin cities has one of largest American Indian population in USA)
- Mahnomon county has largest proportion of minorities (39%)
- 86 of Minnesota's 87 counties count at least 100 individuals in a minority group
- 85% of new labour market entrants are women, immigrants, or people of colour
- Ethnic minorities comprise 45% of USA GDP

Healthy community engages in community building – seeks to empower individuals and groups of people by providing them with the skills they need to effect change in their own communities

Healthy People 2020 Oral Health Section

- Prevent and control oral and craniofacial diseases, conditions, and injuries to improve access to related services
- IDed 17 objectives to improve

A socially responsibly dentist:

- Provides access to health care services that focus on both treatment and prevention for all community members
- Participates as a community advocate for promotion of oral and systemic health
- Recognizes there are multiple determinants of health that require attention when caring for the community's health
- Works to improve the health of the community and health care system

## Dental Therapy

Dental therapist – mid level practitioner working under DDS supervision to educate and provide evaluative, preventative, restorative, and minor surgical care defined under the region she/he practices in.

### Dental Workforce

11% < 35

18% 35-44

31% 45-54

30.5% 55-64

10% > 65

2008 – MN legislature calls for study overseen by health department to create mid-level dental practitioner

- Improve access to care (geographical remote regions, culturally isolated areas, economically disadvantaged, kids)
- Oral health and disease prevention education
- Increased operational productivity and efficiency, Allows dentist to do more surgery
- Report back by Jan 15, 2014

Other places	Lessons
<ul style="list-style-type: none"> <li>- Canada – 32 years – first nations in Saskatchewan</li> <li>- New Zealand – 70 years</li> <li>- England – 25 years</li> </ul>	<ul style="list-style-type: none"> <li>- Nationally funded health care</li> <li>- Kids = greatest beneficiaries</li> <li>- Equivalent quality of care</li> <li>- Public and professional knowledge required for patient acceptance</li> <li>- Some combining hygienists and therapists into combined program</li> </ul>

General Supervision	Indirect Supervision
<ul style="list-style-type: none"> <li>- Education</li> <li>- Preliminary charting of oral cavity</li> <li>- Radiographs</li> <li>- Polishing, topical agents, sealants, fluoride varnishes, etc</li> <li>- Pulp vitality testing</li> <li>- Desensitizing resins</li> <li>- Temporary restorative, atraumatic restorative therapy</li> <li>- Mouthguards, soft occlusal guards</li> <li>- Tissue conditioning, soft relines</li> <li>- Dress changes</li> <li>- Tooth re-implantation</li> <li>- Local anesthetics</li> </ul>	<ul style="list-style-type: none"> <li>- Emergency palliative treatment of pain</li> <li>- Place and remove space retainers</li> <li>- Cavity preps, restore primary and permanent teeth, temporary crowns, pre-formed crowns, crown preps</li> <li>- Pulpotomies on primary teeth, indirect and direct pulp capping for primary and permanent teeth</li> <li>- Stabilize re-implanted teeth, extract primary teeth</li> <li>- Brush biopsies</li> <li>- Remove suture</li> <li>- Repair defective prosthetic devices, re-cement permanent crowns</li> </ul>

- Advanced DT – can do all under general supervision, same practice setting as a regular DT
- Must complete advanced program, pass clinical exam, be licensed as a DT
- 2K hrs of dental therapy practice, graduate masters advanced DT program, pass board certification exam, apply for cert
- 50% of patients must be in MN health care program, disability/chronic condition with difficulty accessing dental care, or have no coverage and gross family income <200% of federal poverty level

### Curriculum Goals

- Same standard for care as DDS (class II amalgam, anterior composite restorations, etc)
- Health promotion/disease prevention, work in a team setting
- Reduce costs of care, improve access
- Licensure exam ready by spring of 2011