Sustaining the Combat Capability of America’s Air Force

Dental Caries Risk in the United States Air Force

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• In 1999-Medical/Dental Services underwent significant change in delivery of care
  • Primary focus was moving from reactive, treatment-oriented approach to more efficient pro-active prevention-based system
  • Changes in doctrine/policy with emphasis on
    • Development/implementation of programmed tools to assess population needs/health status
    • Management of disease conditions with ability to evaluate health status improvement and delivery system effectiveness
• Under direction of USAF Surgeon General
  • Population-Based Health Plan developed
    • Brought together policies, programs, tools necessary to deliver population health
DENTAL POPULATION HEALTH

• Initiative to decrease dental disease
  • Not uniform within USAF population but skewed
• Increase fitness of Airmen
• Impart better understanding of health to Airmen
• Refocus efforts to those at risk for future disease
• Identify those at highest risk for disease
  • Education
  • Prevention
  • Treatment interventions
• Use metrics to describe the oral health
  • Tool to aid Dental Treatment Facilities (DTFs) in understanding the dental health needs of their patients
  • Validate improvement
• Began collecting DPHM during periodic dental exam
  • Purpose was to
    • Understand health needs of population
    • Identify those at highest risk
    • Allow us to employ targeted prevention/intervention activities
    • Improve the population health of the AF by guiding dental clinicians to more effective preventive strategies

• Recording
  • Caries risk assessment
  • Periodontal Screening and Recording score
  • Tobacco use

• Reported at the AF, MAJCOM, base and patient levels
DPHM

• **Target**
  • Identify the most appropriate population subgroups for our limited resources
  • Prioritize limited resources to those health problems determined to be the most important
  • Best available, evidence-based prevention and treatment options to address health problems

• **Monitor**
  • Oral health surveillance ability
    • To gauge where increased resources are needed
    • To better assess the overall dental health of the AF
• Overall strategy was to allow efficient disease management with emphasis on prevention
  • Resulting in decreased percentages of population with disease, thus decreasing costs

• Analyzing data over time would allow AF to measure general oral health improvement

• Goal was to raise oral health and dental readiness of AF population
CARIES RISK ASSESSMENT

• USAF assessment is based on the American Dental Association (ADA) recommendations
  • Patients classified into low, moderate, and high risk categories

• ADA emphasized
  • That patients should be routinely evaluated for presence/absence of risk indicators for disease process
  • Patients/groups identified as high-risk would be prescribed a more intense prevention program
    • Potentially achieving a clinically significant impact
  • Targeting interventions has implications for costs of services to patients, employers, and publicly supported programs
CARIES RISK ANALYSIS

• Describe dental caries risk of active duty AF from October 2000 through September 2004 across selected demographic variables

• Data obtained by cross-referencing two databases
  • Dental files from Population Health Support Division
  • Personnel files from USAF Personnel Center

• Dental files
  • Caries risk, tobacco use

• Personnel files
  • Gender, age, rank group, education level, race, marital status, years of military service, career field

• Evaluated two groups
  • Entire population (273,000-336,000)
  • Four-year cohort (147,893)
CARIES RISK FOR ENTIRE POPULATION

Figure 1: Distribution of caries risk FY01-FY04 overall

<table>
<thead>
<tr>
<th></th>
<th>FY01</th>
<th>FY02</th>
<th>FY03</th>
<th>FY04</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>69.2%</td>
<td>72.7%</td>
<td>73.9%</td>
<td>75.1%</td>
</tr>
<tr>
<td>Moderate</td>
<td>19.7%</td>
<td>18.1%</td>
<td>17.6%</td>
<td>17.3%</td>
</tr>
<tr>
<td>High</td>
<td>11.0%</td>
<td>9.2%</td>
<td>8.4%</td>
<td>7.6%</td>
</tr>
</tbody>
</table>
Figure 2: Distribution of caries risk FY01-FY04 by age group
Figure 3: Distribution of caries risk FY01-FY04 by smoking status
Figure 4: Distribution of caries risk: FY01-FY04 for the four-year cohort

<table>
<thead>
<tr>
<th></th>
<th>FY01</th>
<th>FY02</th>
<th>FY03</th>
<th>FY04</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>69.4</td>
<td>74.5</td>
<td>77.1</td>
<td>79.2</td>
</tr>
<tr>
<td>Moderate</td>
<td>19.5</td>
<td>18.0</td>
<td>17.0</td>
<td>16.0</td>
</tr>
<tr>
<td>High</td>
<td>11.1</td>
<td>7.6</td>
<td>5.9</td>
<td>4.8</td>
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</tbody>
</table>
FOUR-YEAR COHORT
CHANGES IN CARIES RISK

<table>
<thead>
<tr>
<th>Caries risk</th>
<th>No change</th>
<th>Better</th>
<th>Worse</th>
</tr>
</thead>
<tbody>
<tr>
<td>All (n=147,893)</td>
<td>64.6%</td>
<td>23.5%</td>
<td>11.9%</td>
</tr>
<tr>
<td>Low (n=102,636)</td>
<td>84.4%</td>
<td>--------</td>
<td>15.6%</td>
</tr>
<tr>
<td>Moderate (n=28,902)</td>
<td>20.9%</td>
<td>73.3%</td>
<td>5.8%</td>
</tr>
<tr>
<td>High (n=16,355)</td>
<td>17.3%</td>
<td>82.7%</td>
<td>--------</td>
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</tbody>
</table>
OTHER FINDINGS

• High caries risk inversely related to
  • Age, rank, education, and years in service

• High caries risk more prevalent in
  • Junior enlisted troops-younger, have less education, and are new to AF

• Caries risk of many younger AF members probably relates to level of dental care received prior to entry

• Tobacco users were found to have an elevated caries risk
  • Most prevalent among young enlisted troops
    • May be due to lack of routine oral hygiene or placing less value on general health
• Caries risk in USAF has decreased
• Caries risk reduced for AF members with extended time in service
  • Probably due to cumulative effect of mandatory periodic dental exam, comprehensive dental treatment provided at no cost to the Service member
• Due to dental population health improvement approaches by AF
• Extensive efforts by entire AFDS
  • Senior leadership buy-in of population health principles
  • Comprehensive training provided to dental providers and technicians
  • Local base health promotion activities
WHAT AND WHY

- Informal calibration of dental examiners by use of monthly Clinical Practice Assessment & Indicators
  - Peer Review
- Periodic inspections of AF preventive dentistry programs by the Health Services Inspection Team
- Unique aspects of military dentistry allows use of sealants/fluoride varnish/chlorhexidine/nutritional counseling/frequent recall
- The caries risk status of AF recruits has not changed significantly over the past 5 years
CONCLUSIONS

• Prevention/treatment of dental caries is essential to maintain AF’s war-fighting capability, while preserving dental readiness
• Caries risk decreasing in AF indicating a gain in oral health
• Caries risk assessment
  • Can improve oral health and increase dental readiness
  • Provides for greater efficiency of dental care in terms of outcomes for money, resources and time
• Risk-based approach is a sound public health strategy
  • Targeting preventive/interceptive care to patients at risk
    • Potentially reducing DoD expenditures
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QUESTIONS?

U.S. AIR FORCE

Integrity - Service - Excellence