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DENTAL HEALTH SERVICES SUPPORT TO DEPLOYED CANADIAN FORCES OPERATIONS IN 2020

By / par Major Stephen Molyneaux

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ABSTRACT

Strategy 2020 laid out a vision for the CF over the next two decades. With a long history of sustainment missions in support of Canada's deployed forces and the likelihood of future operations in a wide variety of environments, the dental health services support capabilities of the Canadian Forces Dental Service must continue to improve to meet the strategic objectives of Strategy 2020. A number of recommendations for changes to meet these strategic objectives will be made. The main recommendation is that dental health services support to operations in 2020 must be organized around a single capability module, a basic and common "building block"

INTRODUCTION

The history of dental support to Canadian soldiers is as long as the nation's history of operating abroad. In 1902, two civilian dentists accompanied the Canadian expeditionary force to South Africa during the Boer War. Canada's first military medical unit, the Army Medical Corps established in 1904, had a contingent of militia dental officers. Uniformed dental service in the regular force began in World War One with the formation of the Royal Canadian Dental Corps. Military dentists served during World War Two and the Korean War in dental clinics mounted on trucks. These facilities were a technological marvel at the time, and were not dissimilar in concept to those in service today. As Canada shifted from war fighting to operations other than war following the Korean conflict, the renamed Canadian Forces Dental Services (CFDS) kept pace. Dental personnel have served in all of Canada's major overseas peace support missions, including the current mission to Afghanistan. Through variations in size and structure, the CFDS has been an integral part of the health service support (HSS) provided to Canada's deployed operations.

Along with most other capabilities of the Canadian Forces (CF), the operational capabilites of the CFDS face the need for major changes due to the new international security environment and advances in military technology. In 1999, the Chief of the Defence Staff released *Shaping the Future of the Canadian Forces: A Strategy for 2020* (Strategy 2020), a strategic vision for the CF in the 21st century.[1] Intended to "guide our planning, force structure and procurement decisions, as well as our investments in personnel, education and training," Strategy 2020 laid out a series of strategic objectives for the CF.[2] This paper will examine these

[1]Department of National Defence, *Shaping the Future of the Canadian Forces: A Strategy for 2020* (Ottawa: DND Canada, 1999).

[2]*Ibid.*, 1.

objectives as they pertain to operational dentistry in the year 2020 and make a number of recommendations for changes to better meet these objectives. It will argue that the main change needed for dental HSS to global operations in 2020 is the adoption of a single capability module, meaning a common "building block" for the task of providing clinical dental treatment to a deployed force, either independently or as part of a group of modules.[3] This capability module includes both trained personnel and their equipment and must be readily deployable, modern, and interoperable with our allies. The module must be simple in concept and sophisticated in capability. To achieve these recommendations, changes in equipment, organization and doctrine will be required.

The objectives of Strategy 2020 will be considered as they relate to the HSS principles of proximity, flexibility, and mobility, and also to the operational priniciple of war of simplicity.[4] As HSS to the land force is considered to be the most intricate due to the mobility and dispersion of land forces, this paper will focus on land operations, although some of what is argued could be applied to the maritime and air components.[5] Regarding the CFDS, this paper will consider only dental HSS to deployed operations and no other aspect of that organization.

STRATEGIC GUIDANCE

Strategy 2020 laid out the following vision for the CF over the next two decades:

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[3] Director General Health Services, *Standing Committee on Operational Medicine Review: Phase One Final Report* (Ottawa: CFHS, 2001), 77.

[4]Department of National Defence, B-GJ-005-410/FP-000 (Ratification Draft) *Health Services Support to Canadian Forces Operations* (Ottawa: DND Canada, 2003), 1-5; and, Canadian Forces College, "Contemporary Principles of War" (Command and Staff Course 31 Activity Package C/JC/WTH 304/SM-1).

[5]Department of National Defence, C/AS/JCP/J/LCP/DOC/L-7 *Canadian Forces Medical Group - Concept of Operations* (Ottawa: DND Canada, 1997), 3.

> The Defence Team will generate, employ and sustain high-quality, combat-capable, interoperable and rapidly deployable task-tailored forces. We will exploit leading-edge doctrine and technologies to accomplish our domestic and international roles in the battlespace of the 21st century and be recognized, both at home and abroad, as an innovative, relevant knowledge-based institution. With transformational leadership and coherent management, we will build upon our proud heritage in pursuit of clear strategic objectives.[6]

These strategic objectives, the "essence of Strategy 2020," are intended to guide defence planning over the next two decades and give Strategy 2020 a "practical effect."[7] The objectives are: innovative path, decisive leaders, modernize, globally deployable, interoperable, career of choice, strategic partnerships, and resource stewardship.[8] Although all of these objectives have some applicability to any element of the CF, the three strategic objectives of globally deployable, modernize, and interoperable have the most relevance for dental HSS.

The Army built on the vision for the CF laid out in Strategy 2020 and implemented a strategy for the land force in its document *Advancing with Purpose: The Army Strategy*, released in 2002.[9] The document described the Army of Today, from the present to five years from now, the Army of Tomorrow, 5 to 10 years from the present, and the Future Army, beyond 10 years.[10] The Army in 2020 will therefore be the Future Army, but decisions affecting any capabilities of this force will be taken during the period embracing the Armies of Today and Tomorrow. Of particular note to dental HSS is the recognition that sustainability, including the long term

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[6]Department of National Defence, *Shaping the Future of the Canadian Forces: A Strategy for 2020*, 8.

[7]*Ibid*., 9.

[8]*Ibid*., 10-12.

[9]Department of National Defence, *Advancing with Purpose: The Army Strategy* (Ottawa: DND Canada, 2002), 3.

[10]*Ibid*., 8.

physical health of personnel, will be a decisive point for the Army.[11] An objective with a 10 year target for realization is the transformation of the Army into a "medium weight, information-age" force.[12] This transformation will influence any dental HSS capabilities operating with the land force in 2020.

CURRENT DENTAL HSS CAPABILITIES

Health care is recognized by Strategy 2020 as an issue that will continue to be a high priority for Canadians and thus for the CF.[13] The CF is morally and legally obliged to provide health care to its personnel, whether in garrison or deployed. The list of medical and dental treatments that the CF has committed to provide its members is extensive and similar to civilian standards.[14]

The CFDS, along with the Canadian Forces Medical Services, are branches of the Canadian Forces Health Services (CFHS). In a land operation setting, the role of medical and dental HSS is to conserve personnel strength for commanders.[15] In garrison and in the field, dental capabilites in Canada belong to the Canadian Forces Medical Group (CFMG). Overseas dental assets belong to the Task Force Commander through some form of deployed composite HSS unit, with CFMG maintaining professional/technical control. CFHS is currently undergoing major reforms and reorganization to correct past difficulties with medical care provided to the

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[11] *Ibid*., 16.

[12] *Ibid*., 20.

[13] Department of National Defence, *Shaping the Future of the Canadian Forces: A Strategy for 2020*, 5.

[14] Director General Health Services, "Spectrum of Care," http://www.forces.gc.ca/health/services/engraph/spectrum_of_care_home_e.asp; Internet; accessed 4 January 2005.

[15] Department of National Defence, B-GL-343-001/FP-00 *Health Service Support* (Ottawa: DND Canada, 2001), 2,127.

CF.[16] Future medical and dental HSS to deployed operations will be affected by the proposed changes from the Standing Committee on Operational Medicine Review, including the identification of operational clinical capabilities as separately deployable modules.[17] This change represents a shift from the current emphasis on clinical capabilities at the unit level or those organized on an ad-hoc basis for particular deployments.

The principle dental HSS equipment for field use at present is the Mobile Dental Clinic (MDC), which is a dental clinic in a metal shelter carried on a medium weight truck. These MDCs are distributed mainly to CFMG's three field ambulances and its single field hospital and dental training institution. Dental personnel in these field units are organized into platoons, each with four treatment sections consisting of a dental officer and two dental technicians. The CF owns sufficent MDCs to equip approximately 30 treatment sections, roughly half of which are currently in operational units. The other half of these treatment sections would be drawn from garrison personnel in support of contingency operations plans. Although it possesses many capabilites, the present MDC was designed in the 1970s and entered service in the early 1980s. As such, it is legacy equipment for the CF.

Medical and dental HSS is currently categorized into various roles defined by function and location.[18] CFHS definitions of HSS roles are compliant with NATO definitions.[19]

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[16]David Salisbury, "Prescription 2020: Considerations for a Military Medical Strategy for the Canadian Forces." (Toronto: Canadian Forces College National Security Studies Course Paper, 2002), 3. http://wps.cfc.dnd.ca/papers/nssc4/salisbury2.doc. Internet; accessed 12 December 2004.

[17]Director General Health Services, *Standing Committee on Operational Medicine Review: Phase One Final Report*, 1-2, 77.

[18]Department of National Defence, *Health Services Support to Canadian Forces Operations*, 1-8.

[19]NATO Standardization Agency, AJP-4.10. *Allied Joint Medical Support Doctrine* (Brussels: NSA, 2002), 16-18.

Role 1 dental care is very basic emergency treatment provided at or near the patient's initial location, not necessarily by dental personnel. Role 2 dental care is sustaining care provided by dental personnel, including emergency care and simple non-emergency dental treatment. This level of care is normally provided at the field ambulance. Role 3 dental care is maintaining care, more comprehensive treatment provided at the field hospital level and possibly by dental specialists. Role 4 is rehabilitative care provided out of theatre, including the most complex dental treatments. Medical roles are similar, with Roles 1 to 3 being respectively emergency care, stabilization, and initial surgery. On current peace support missions, a single deployed dental treatment section with an MDC provides Role 1 and 2 levels of care, and some Role 3 treatment. This ability for a single section to operate across the formal HSS roles is a current strength for dental HSS that must be maintained and strengthened in the future dental capability module.

DENTAL HSS CONSIDERATIONS IN THE FUTURE OPERATING ENVIRONMENT

It is likely that HSS in the future will be required for a wide variety of overseas operations. Health care planning scenarios requiring dental support range from disaster relief to international humanitarian missions to warfighting in collective defense.[20] Future dental HSS capabilites must be flexible and robust enough to operate in any of these scenarios.

Warfighting will likely involve smaller, more potent forces, with sophisticated command and control that will allow the force to be widely dispersed in the theatre of operations.[21] These

[20]Director General Health Services, *Standing Committee on Operational Medicine Review: Phase One Final Report,* Annex K, 22-23.

[21]Scott Beaty, "The Revolution in Military Medical Affairs," *Parameters* 27 no. 4 (Winter 1997): 5. Journal on-line; available from http://carlisle-www.army.mil/usawc/Parameters/97winter/beaty.htm; Internet; accessed 12 December 2004.

conflicts will occur quickly, with less build up of forces and shorter durations.[22] The Canadian army has adopted manoeuvre warfare as its concept for warfighting.[23] The challenge for HSS assets in such future warfighting operations will be to have sufficient mobility and agility to keep up with the supported forces, rather than the capacity and endurance to treat large numbers of patients.

For operations other than war, especially humanitarian relief to impoverished areas of the world, the challenge will be reversed and the capacity to treat large numbers of patients will be required.[24] Canadian military dental assets have yet to be deployed on a mission solely to provide care to a civilian population, but it cannot be assumed that they will never be deployed to a humanitarian crisis for such a reason, especially considering that civilian substitutes for this specialized capability are rare. The recent Disaster Assistance Response Team deployment to Sri Lanka may be a forerunner of many such HSS humanitarian missions.

The physical environment in recent dental HSS deployments has included such varied environments as the hot and dusty climate of Afghanistan and the cold conditions of the Ontario/Quebec ice storm of 1998. Future deployments will see more of the same, and could also see land deployments to humid tropical forests of Sub-Saharan Africa and the extreme cold of Canada's far north. Dental HSS capabilities must be able to operate in all of these environments.[25] This requirement has been and will continue to be a challenge for some highly sensitive dental equipment.

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[22]Steven F. Gouge, "Combat Health Support of the Transformation Force in 2015" (Carlisle Barracks: United States Army War College Paper, 2001), 21. http://handle.dtic.mil/100.2/ADA390517; Internet; accessed 12 December 2004.

[23]Department of National Defence, *Health Service Support*, 4.

[24]Beaty, 9.

[25]Department of National Defence, *Health Service Support*, 117.

STRATEGY 2020 OBJECTIVE: GLOBALLY DEPLOYABLE

Regarding its strategic objective of globally deployable, Strategy 2020 seeks to "enhance the combat preparedness, global deployability and sustainability of our maritime, land and air forces."[26] Two specific targets are a vanguard and main contingency force "fully deployable to an offshore theatre of operations within 21 and 90 days respectively" and to "enhance our strategic airlift and sealift capability."[27] Implications for dental HSS from this emphasis of deployability are to be found in both the future patient population and future dental capabilities.

For warfighting and peace support operations, the deployed patient population will be members of the CF. The initial warfighting force will likely be smaller with highly skilled personnel who arrive in theatre and begin their mission quickly. The loss of a single member of this force for health reasons could have grave consequences.[28] Traditionally CF dental HSS has been provided for land deployments of battle group size and greater, and it may not be efficient to deploy CF dental HSS assets in support of smaller future warfighting forces.

One way of addressing this situation would be to raise the dental fitness level for those CF members with a high likelihood of deploying in small groups, such as special operations forces. The CFDS uses NATO classification standards for dental fitness, with Class 1 dental fitness meaning that the patient has no requirement for any type of dental treatment at all, and Class 2 dental fitness meaning a need for emergency dental treatment is not anticipated within 12 months.[29] Class 3 and Class 4 patients have oral health conditions rendering them unfit for

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[26]Department of National Defence, *Shaping the Future of the Canadian Forces: A Strategy for 2020*, 11.

[27]*Ibid*., 11.

[28]Salisbury, 10.

[29]Military Agency for Standardization, STANAG 2466 (Edition 1) *Dental Fitness Standards for Military Personnel and a Dental Fitness Classification System* (Brussels: MAS, 1999), A-1, B-1.

deployment. The great majority of CF members are Class 1 or more commonly Class 2 patients, and thus considered fit for deployment. However, for highly deployable and irreplacable warfighters in 2020 a class 1 dental fitness may be required at all times. This is a meticulous standard and would be difficult to implement due to treatment time requirements, but reflects the high state of overall health that personnel may require when operating without ready access to traditional medical and dental HSS. Currently this patient group is less likely to be at Class 1 dental fitness than some other groups due to competing time demands making it less available for dental treatment. The United States Army has set a goal of shifting "the majority of soldiers from Class 2 to Class 1" for its Army After Next, a very ambitious goal for that force.[30]

Due to their need for extensive human interactions, future peace support missions will not see the same reduction in numbers or duration as warfighting missions. Similarily, future periods of intense conflict with smaller forces may be followed by larger stabilization forces deployed for a longer period.[31] The CF will continue engaging in these larger types of missions, so robust dental HSS capabilites will need to be maintained. The most effective means of preserving personnel strength for commanders will remain the ability to prevent dental casualties, and to treat those casualties that do arise far forward and with a quick return to duty, the two HSS principles of mobility and proximity.[32] Preventative care provided in garrison and by deployed dental HSS assets will remain the services that most effectively support commanders for future CF land operations.[33] For humanitarian missions to civilian populations,

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[30]Conrad F. Bodai, "Dental Support for the Army After Next" (Carlisle Barracks: United States Army War College Paper, 1998), 19.

[31]*Ibid*., 9.

[32]Department of National Defence, *Health Services Support to Canadian Forces Operations*, 1-5.

[33]Director General Health Services, *Standing Committee on Operational Medicine Review: Phase One Final Report*, 36.

a capacity to treat large numbers of patients with very high dental treatment needs will be required.

Shifting from the future patient population to deployed dental HSS capabilities, considerations for the future include dental HSS roles and the characteristics of the dental capability module. There is an ongoing debate on whether the roles for HSS as currently defined will have much relevance for future operations, especially warfighting operations. Some have argued that the traditional Role 2 of stabilization will no longer be necessary as "brilliant medics", exceptionally well trained and with advanced technology, will stabilize casualties at Role 1, allowing for evacuation directly to what are now the facilites of initial surgery and hospitalization at Role 3.[34] Others have argued that Role 2 HSS units with enhanced evacuation abilities will remain relevant in the 21st century.[35] In the CF, traditional Role 2 care is provided by field ambulances, where a large portion of current dental HSS assets are located at present. The long term fate of the field ambulance is thus of interest to dental HSS planners.

For dental HSS, the answer to the question of roles will be to structure itself around a single dental capability module of one new MDC staffed by one dental treatment section. This module must be able to function as the sole dental capability in theatre for Roles 1 through 3 and thus must be equipped for all but the most comprehensive dental treatments. If more than one module is required, additional modules can be deployed and "task tailored" for the specific operation.[36] The proper location of each module will be dictated by the need to treat and quickly return to duty as many patients as possible, and may be either with a larger HSS unit or

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[34]Beaty, 6.

[35]James C. Taylor, "Whither the Field Ambulance? Role 2 Land Health Service Support in the 21st Century Battlespace" (Toronto: Canadian Forces College Advanced Military Studies Course Paper, 2002), 20. http://wps.cfc.dnd.ca/papers/amsc5/taylor.doc; Internet; accessed 12 December 2004.

[36]Department of National Defence, *Shaping the Future of the Canadian Forces: A Strategy for 2020*, 8

independent of the same. This flexibility is a principle of HSS, and can be employed more readily for dental HSS because of its more limited range of functions as compared to medical HSS.

The definitions of roles are tending to become more complex in developing CF HSS doctrine, with Roles 1 and 2 gaining "enhanced" sub-categories.[37] Although these definitions may remain relevant for medical HSS, units structured to provide defined Roles are not critical for current dental HSS and will be less important in the future. Larger HSS units such as the field ambulance and field hospital, unlikely to deploy as a single unit in the future, should function in the future as garrison holding units for the MDCs and treatment sections of each dental HSS capability module, rather than as clinically capable entities themselves. The focus of attention should be on making each module as independent and as clinically comprehensive as possible. The capability module can be seen as an attempt to provide standardization and order to the ad-hoc HSS clinical structures currently provided by units for each deployment.

The number of dental capability modules required in 2020 will depend on the size of the CF. The current fleet of approximately 30 MDCs were acquired for a 1970s era CF larger than the force today. If the CF returns to a strength of 80,000 personnel, a modestly decreased fleet of 25 MDCs would be sufficient to support the recent CF operations tempo as well as training requirements and contingency operations plans. Garrison treatment requirements rather than operational requirements will be the determining factor for the personnel strength of the CFDS needed to serve the future force. Historically, dental treatment requirements of a deployed force have not varied with the type of operation, and instead the number of patients in need of dental

[37]Department of National Defence, *Health Services Support to Canadian Forces Operations*, 6-5 to 6-8.

treatment has been a function of the size of the supported force and its baseline oral health.[38] This relation is not likely to change in 2020, and one dental module staffed by a dental officer and two dental technicians will continue to be sufficient to meet the treatment needs of a battle group sized deployment.

The roles of uniformed HSS personnel has been debated in recent literature. Specifically, the role traditionally filled by deployed medical officers may be filled by other medical personnel operating with advanced medical technology. In the CF the traditional role of physicians is changing regardless of technology due to the chronic shortage of medical officers.[39] However, the specific technical knowledge and very particular manual skills required to deliver dental treatment, and the fact that dental problems are non-life threatening and thus allow time for patient transport prior to treatment, make it unlikely that dental officers will need to be replaced in the same way. These facts suggest that current staffing levels for dental officers and technicians are appropriate.

The question of whether the CFDS could be disbanded and dental care outsourced to civilian providers was examined in the 1990s. It was determined then that the chief reason for maintaining a uniformed dental service was the fact that it would be very difficult if not impossible to provide dental care in a theater of operations with civilian providers. Given this fact the CFDS is an organization that has given the highest priority to providing personnel for deployed operations, and will certainly continue to do so in the future.

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[38]Department of the Army, Field Manual 4-02.19

Both the CF and the United States Army have recognized that dental HSS should be deployable as modules.[40] Flexibility and simplicity will be the key concepts for the equipping of the CF dental capability module in 2020. The module should be deployable in a variety of modes. When medium lift was available, both the metal shelter containing the treatment facility and its prime mover vehicle would be transported to the theatre. When only light lift was available or mobility was not critical, as in a static peace support mission, the shelter could be transported without its prime mover. In either case, the supporting equipment required for dental treatment, such as the power generator and air compressor, would be fixed to the shelter but detachable. No auxillary trailer would be required to operate the clinic. This supporting equipment must be as light and quiet as possible for deployability and tactical utility in the field. Current MDCs require a noisy and outdated generator on a separate trailer.

When only very minimal transport was available, the same dental equipment used inside the metal shelter would be shipped into theatre without the shelter, accompanied by the same supporting equipment detached from the shelter. In this way the same equipment could be employed in a variety of modes as determined by the needs of the mission and available transport. This change would be an improvement over the current situation, in which different equipment is used for air transportation of a lighter equipment set vice sea transportation of the MDC. As this air transportable equipment is different, it presents separate training requirements which are difficult to fulfill due to the limited number of sets available.

The shelter employed should be a standard sized shipping container to facilitate transport

[40] For the CF, see Director General Health Services, *Standing Committee on Operational Medicine Review: Phase One Final Report,* Annex K, 16; and for the United States Army, see Department of the Army, *Dental Service Support in a Theater of Operations*, 2-5.

by sea, air, and road. A project to replace the Army's medium truck fleet and possibly its existing specialized shelters is in development. The preliminary submission for a new dental shelter contains many of the features suggested above.[41]

In a warfighting mission, HSS mobility will be critical to keep up with the highly mobile and dispersed supported force, and thus the prime mover for the MDC would be required. Excellent communications equipment for situational awareness and the ability to deploy quickly to future conflicts will be other essentials for warfighting HSS.[42] Dental modules will also need to be self-contained for independent operation. Future commanders may consider deployed dental capability modules without these characteristics as more of a hinderance than an asset. Even in a static operation other than war in which the prime mover is not deployed, good communications, rapid deployability, and independent operation will be requirements of dental HSS modules in 2020. At present the communication ability of the MDC fleet is poor to non-existent, leaving the dental section very dependent on other elements for situational awareness.

The dental sections staffing these modules naturally will need to be well trained and qualified to perform their dental functions. The recent case of United States Army combat service support personnel being captured during the invasion of Iraq when their convoy took a wrong turn demonstrates that support personnel will also need to be well trained in military skills in the non-contiguous battlespace environment of future operations. For HSS personnel, this need extends to their Geneva Convention duty to defend their patients as well as themselves.[43]

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[41]Personal communication, DCOS Dental Services 3-2 and author, December 2004.

[42]Steven F. Gouge, "Combat Health Support of the Transformation Force in 2015" (Carlisle Barracks: United States Army War College Paper, 2001), 22,25. http://handle.dtic.mil/100.2/ADA390517; Internet; accessed 12 December 2004.

[43]Office of the Judge Advocate General. "Geneva Convention (I) for the Amelioration of the Condition of the Wounded and Sickin Armed Forces in the Field - 1949," in Collection of Documents on the Law of Armed Conflict, 2004 ed., ed. Directorate of Law Training (Ottawa: DND, 2004), 71.

STRATEGY 2020 OBJECTIVE: MODERNIZE

The Strategy 2020 objective of modernize is to:

> Field a viable and affordable force structure trained and equipped to generate advanced combat capabilities that target leading edge doctrine and technologies relevant to the battlespace of the 21st century.[44]

As is the case for other capabilities throughout the CF, the dental capability module in 2020 will employ advanced technologies. In the case of HSS, advanced technologies will be necessary to keep up with evolving civilian standards of care. However, over reliance on technology in developing future HSS capabilities ought to be avoided since some future health technologies may turn out to be too expensive or not viable for military applications.[45] For dental HSS this caveat means that well qualified personnel will remain the core of the dental capability module rather than its equipment.

Nevertheless, the current fleet of MDCs is three decades old in design and in need of a replacement. The standard of care expected from deployed CF HSS for future missions will be equivalant to the standard of care accessible to most Canadians within one or two hours.[46] For dental HSS, this requirement means that deployable dental capability modules must keep up with the technology of a modern civilian dental office. The current MDC is falling behind in this regard. Of particular interest will be information management and telecommunications, two areas noted as important for R&D in Strategy 2020.[47] For dental HSS, the deployed module

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[44]Department of National Defence, *Shaping the Future of the Canadian Forces: A Strategy for 2020*, 10.

[45]Gary Cecchine, and others, *Army Medical Strategy: Issues for the Future*, Report Prepared for the Army Medical Department (Santa Monica: RAND Arroyo Center, 2001), 32,38. http://handle.dtic.mil/100.2/ADA400828; Internet; accessed 12 December 2004.

[46]Director General Health Services, *Standing Committee on Operational Medicine Review: Phase One Final Report,* 2.

[47]Department of National Defence, *Shaping the Future of the Canadian Forces: A Strategy for 2020*, 10.

must have access to computerized dental records to remain both up to date technologically and able to comply with legislative requirements for health record keeping.[48] The patient's same full digital record would then be available across the continuum of in garrison and deployed dental HSS. At present the deployed team generates a temporary paper dental record and does not have access to the full paper dental record. A digital radiography capability will also be an important means of exchanging information between deployed dental teams and specialists at home and will have lighter equipment requirements than traditional film radiography.[49]

Another area of interest will be future standards for infection control and environmental protection. The current MDC was designed when these factors were of less concern than they are today. Since high infection risk treatment will be performed in the replacement MDC, the shelter must have surfaces easily disinfected to modern infection control standards.[50] The waste water generated by dental treatment must be safely stored and disposed of when proper facilities are available to the deployed module. As is becoming the standard in the civilian sector, mercury will also need to be separated from this waste water.[51]

In addition to its equipment, training for the personnel of the dental section in 2020 will have to reflect modern practices, both military and civilian. One necessary step will be to update the tactical doctrine concerning the future dental HSS module. Current doctrine described in the

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[48]Royal College of Dental Surgeons of Ontario, *Dental Recordkeeping* (Toronto: RCDSO, 2002), 2.

[49]Bodai, 11.

[50]Royal College of Dental Surgeons of Ontario, *Infection Control in the Dental Office* (Toronto: RCDSO, 2002), 3, 6.

[51]Albert O. Adegbembo and Philip A. Watson. "Estimated Quantity of Mercury in Amalgam Waste Water Residue Released by Dentists into the Sewerage System in Ontario Canada." *Journal of the Canadian Dental Association* 70 no. 11 (December 2004): 759.

publication *Dental Services in Battle* is out of date.[52] It should be updated after the operational HSS doctrine currently being promulgated is ratified.[53] The updated doctrine should have useful and modern information on dental subjects such as infection control and military subjects such as the future battlespace. It should also emphasize the dental capability module as the fundamental building block for dental HSS.

STRATEGY 2020 OBJECTIVE: INTEROPERABLE

To enhance interoperability, Strategy 2020 seeks to:

> Strengthen our military to military relationships with our principle allies ensuring interoperable forces, doctrine, and C4I (command, control, communications, computers, and intelligence).[54]

Interoperability with United States Armed Forces is recognized as of pre-eminent importance.[55] For dental HSS in 2020 this objective means having similar capabilities as our ally the United States.

Currently, dental HSS interoperability with U.S. forces is fair. Some equipment is used in common between the CFDS and American counterparts in their three services. The dental treatment capabilites of deployed sections are essentially the same. Most post-graduate training

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[52]Department of National Defence, B-GL-312-012/FP-001 *Dental Services in Battle* (Ottawa: DND Canada, 1992), 1-4-1, 2-1-1, 2-2-1.

[53]Department of National Defence, *Health Services Support to Canadian Forces Operations*, ix.

[54]Department of National Defence, *Shaping the Future of the Canadian Forces: A Strategy for 2020*, 11.

[55]*Ibid*., 9.

for Canadian dental officers is done in United States Army training facilities, in particular for advanced general dentists, a major speciality occupation for both forces.[56]

However, there are some developments concerning our interoperability with the United States that could prove to be a difficulty in 2020. United States Armed Forces dental officers have a paramedical role as triage officers in mass casualty situations that could arise during any warfighting or unstable peace support mission.[57] Current CF HSS doctrine recognizes a paramedical role for dental officers but the specific role of triage officer in mass casualty situations is being lost.[58] This discrepancy may limit the future ability of Canadian dental officers to operate within American HSS facilities.

Canada does meet and should be able to continue to meet the specific capabilities specified for NATO in Role 1 to 3 dental care.[59] Even as treatment roles become increasingly blurred, the treatment requirements will remain and CF dental HSS modules must continue to fill them. Interoperability with nations other than the United States and a certain number of other countries has limitations in that the standard of dental care in some parts of the world do not meet the standard of Canadian dental care. The practical implication of this fact for 2020 will be that if Canada is involved in a combined mission with nations for which this lower standard is a

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[56]Russell J. Czerw, "Changes in the Army Dental Corps: Supporting Transformation" (Carlisle Barracks: United States Army War College Paper, 2002), 16. http://handle.dtic.mil/100.2/ADA401041; Internet; accessed 12 December 2004.

[57]Department of Defense, Joint Publication 4-02 *Doctrine for Health Services Support in Joint Operations* (Washington: DoD United States, 2001), III-8. http://www.dtic.mil/doctrine/jel/new_pubs/jp4_02.pdf; Internet; accessed 12 December 2004.

[58]Department of National Defence, *Health Service Support*, 44; and Director General Health Services, *Standing Committee on Operational Medicine Review: Phase One Final Report,* 17.

[59]Military Agency for Standardization, STANAG 2465 (Edition 1) *Tasks for the Appropriate Staffing and Training of Dental Officers and Ancillary Personnel for Wartime Operations and Operational Deployments*. Brussels: MAS, 1999), iii.

concern then the CF will be obliged to ensure that its personnel receive care of an acceptable standard. This situation will be more likely to arise in the future as more countries join NATO.

CONCLUSION

The CFDS must meet the strategic objectives laid out in Strategy 2020 of globally deployable, modernize, and interoperable. The CFDS should develop a new dental capability module, one dental treatment section and associated replacement MDC, as the standardized and sophisticated building block on which to structure dental HSS to overseas missions. The dental capability module should be able to achieve all tasks for dental Roles 1 through 3. The MDC for the 2020 dental capability module should be flexible enough to deploy in a variety of modes as the mission demands and available transport allows. For simplicity the same dental and support equipment should be used in all of these modes. Deployed dental capability modules must have excellent communications ability and be able to operate independently.

To replace the aging MDC fleet, the new dental shelter and its associated equipment should be modern, including advanced computer technology for patient records. The future dental module must meet 2020 civilian standards in infection control and environmental protection. Dental tactical doctrine should be updated to reflect the emphasis on the dental capability module. Dental personnel must be well trained professionally and militarily.

The CFDS is capable now of limited interoperability with the armed forces of the United States. This ability should be fostered. Likewise, CF dental HSS meets the standards of our NATO allies, but must also continue to achieve Canadian dental standards of care on all combined deployments. The CF should be prepared to be the lead nation for dental support when Canada is the participating nation with the highest standard of dental care.

Seeing these recommendations fully realized would not be a simple task. Dental HSS benefits from being part of a larger HSS organization and thus with access to capabilities it does not possess on its own. At the same time the need for conformity within this HSS organization may inhibit the application of solutions specifically suited for dental HSS. Of course, fiscal realities also remain a limiting factor. The CFDS has a proud history of support to Canada's overseas military deployments and will continue to fulfill this role. Dental HSS to overseas missions will meet the vision and strategic objectives of Strategy 2020.

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