# SMART Center Development

Thomas A. Balcom

CDR, MC, USN

Prepared for 24 June 2002 IPT in Quantico, VA, but we didn't get this far. Will probably give later. Need other Sports Med MDs input, but lots of homework here and this is good starting point.

# Outline of Brief

- Population
- Injury Rates
- Referral Rates
- Patient Visits per Year – Initial, Follow-up, Total
- # Personnel Required (FTE's)
- Square Feet Required
- Cost to Build or Modify a Space
- Start-up Equipment
- Sustainment Costs (OPTAR & Civilian Personnel)

# Population

- Cost analysis for SMART Center planning must start with defining the average size and type of the intended population to be served at a given site.
- Significant seasonal fluctuations or potential expansion in the intended population size are also important.

# Injury Rates

- The assumption here is that only musculoskeletal injuries will be treated at these SMART Centers.
- The rate of these injuries in the population of interest becomes important.
- Injury rates vary significantly.
- The injury rates presented are based on persons that presented for evaluation.

# # New Musculoskeletal Injuries per 100 persons in a month

| | |
|---|---|
| • Army Infantry | 6-12 |
| • Male Recruits | 10-15 |
| • Female Recruits | 15-25 |
| • Navy Special Warfare Training | 30 |
| • Royal Marine Commandos | 34 |
| • Triathletes | 197 |
| • Competitive Athletes | 210 |
| • Recreational Adult Fitness | 233 |

- Source: Am J Prev Med 2000;18(3S) Military Training Related Injuries. Kaufman KR, Brodine S, Schaffer, R.

# Referral Rates

- The population served at a given SMART Center will depend on whether it is designed to be a first contact site (level A) or a referral site (level B) or both.
- If all musculoskeletal injuries are going to be initially evaluated at the site the referral rate is 1.0.

# Referral Rates

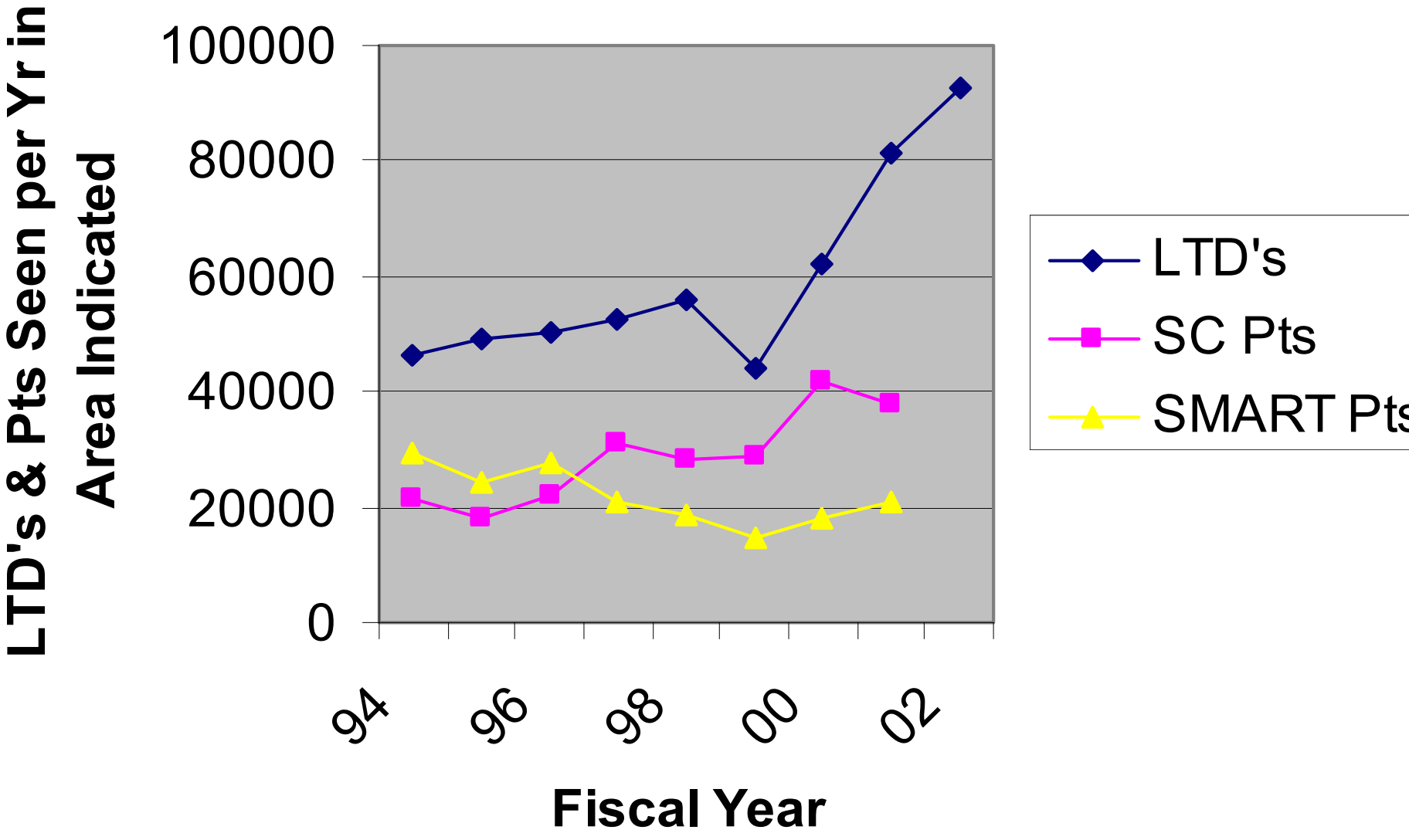
- The question becomes what is the appropriate referral rate from level A to level B?
- Benchmark = 0.39
  - IDC's on ships would refer 39% of their patients with musculoskeletal injuries to a higher level of care if immediately available.
  - Source: Informal Survey conducted by CDR Gerry Murphy (Regional Support Medical Officer, San Diego) and LT Mark Gilford (Sports Medicine PA) in May 2002
- Athletic Trainers may refer less due to their skill level, or more in a more seriously injury prone population.

# Lesson Learned

- "Prior to 1992 recruits with MS injuries at RTC great lakes were evaluated in a primary care clinic by GMOs…often with limited knowledge. This combination was associated with frequent misdiagnoses, incorrect or inadequate therapy, poor continuity of care, and prolonged recovery times which resulted in numerous days of lost training. In addition many recruits failed to complete training due to their MS injuries."

  - Kelly EW and Bradway LF. Military Medicine 1997

# Mission Drift



# Initial Visits (IV) per Year

- IV/yr = Population x Injury Rate x 12 x Referral Rate
- 11343/yr = 4750 x (20/100/month) x 12 mo/yr x 1.0

# Follow Up Visits per Year

- Some patients will require many.
- Some will require few.
- Benchmark.
  - No real good ones here.
  - Used 1.5 Follow-up visits per initial visit for this presentation.
  - May be too low.
  - Input from Sports Medicine Colleagues?

# Total Visits per Year

- Total Visits = Initial + Follow-ups

# Staffing Number Required

- # Staff required is driven by # patient visits per year and # non patient care duties assigned to the staff.

# Staffing # Required

- FTE = Full time equivalent
- FTE = 1 person working full time on a given job with no collateral duties
- FTE Benchmarks are based primarily on known staffing levels at SMART Centers at times of documented success.
- One benchmark uses medical clinic staffing equations.

# Staffing Benchmark

- Ratio of 1 FTE per 1250 visits per year occurs repeatedly.
- This is less staffing than used at one BMC.
- If the staff have more collateral duties, teaching requirements, data collection responsibilities, etc then more staff would be required.
- As we move away from the 1:1250 ratio we move away from a ratio associated with success.

# Staffing Benchmarks

- Site 1 1999 – 14-17:17,358 1:1000-**1:1239**
- Site 2 2000 – 12.6-13:12,137 1:933 – 1:963
- Site 3 1996 – 8:10,000 **1:1250**
- Site 4 1995 – 20-23:29,157 **1:1267**-1:1457
- Site 5 by eq – 26:32,000 **1:1230**
- BMC - 94-103:74,000 1:718-1:787

# Space Required

- Driven by # patient visits per year.
- Seasonal fluctuations will also be important for local planning.

# Space Benchmark

- Used 420 square feet per 1000 patient visits per year.
- This is low-mid range benchmark.

# Space Benchmarks

- BMC
  - 60,256 sq ft → 74,000 pts/yr →814 sq ft / 1000 visits
- SMART MCRD-SD Proposed New Facility
  - 11,250 sq ft →32,000 pts/yr → 352 sq ft / 1000 visits
- Pearl
  - 14,800 sq ft → 21,969-31359 pts/yr → 472-673 sq ft / 1000 visits
- SMART BMC-MCRD-SD (Current)
  - 7,500 sq ft → 32,000 pts/yr → 234 sq ft / 1000 visits
  - Too tight

# Cost to Build/Modify a Structure

- Cost to Build New Facility = $244/sq foot
  - Source Facilities plans for MCRD San Diego FY 2000
- Cost to Modify a Non-Medical Building = ~ $100/sq foot
  - tremendous variability here
- Cost to Modify a Medical Building = ~ $5/sq foot
  - Source – recent cost of modifications to BMC-MCRD
  - Significant variability here

# Start-up Equipment

- Benchmarks
  - Pearl $5.10 per patient visit per year
  - BMC-MCRD Inventory Value = $ 7.81 per patient visit per year
  - SOI West Start up in 1996 = $9.00 per patient visit per year
  - Used mid range value of $ 7.81 on spreadsheet

# OPTAR Required

- Benchmark
- SMART at SOI West in 1996 used $1.50 per patient visit per year
- Currently value is $1.84 per patient visit per year – adjusted for inflation.
- Used $ 1.84 and planned phased replacement of all equipment every 7 years.

# Civilians hired

- Assumed 50% of staff will be civilians
- Average cost of a contracted civilian is $57,000 per year.

**POINT PAPER**

**SUBJ: DEVELOPMENT OF A SPORTS MEDICINE AND RECONDITIONING TEAM (SMART) CENTER PIER SIDE AT NAVAL STATION SAN DIEGO – A FIRST STEP IN THE REGIONALIZATION OF THE CONCEPT DESIGNED TO ATTACK THE FORCE WIDE MUSCULOSKELETAL INJURY PROBLEM**

**BACKGROUND**

a. Primary Care Sports Medicine is a relatively new specialty. It includes those theoretical, research and clinical disciplines of medicine that apply the influences of exercise, training, reconditioning and sport on healthy, inactive and injured people. The goals include the treatment and reconditioning of injury in the individual, and the prevention of injury in populations at risk.

b. The American Medical Society for Sports Medicine defines the Sports Medicine Physician as the leader of the team coordinating care for the athlete. Other members can include athletic trainers, physical therapists, podiatrists, chiropractors, orthopedic surgeons and support staff. The modern Sports Medicine team takes the concepts involved in the timely evaluation, accurate diagnosis, aggressive treatment and accelerated reconditioning of the injured athlete, and applies these principles to common orthopedic and occupational injuries encountered in society. In the case of the individual Sailor/Marine, this involves the treatment of musculoskeletal injuries that invariably occur in the performance of his/her daily duties.

c. The cornerstones of Sports Medicine are the early accurate diagnosis and the comprehensive graduated reconditioning program. Each step in reconditioning is integrated with and dependent upon the successful completion of the one before. The normal progression in injury repair includes: reduce the swelling; regain range of motion, strength, flexibility, endurance, power, speed, balance and agility. These objectives are achieved through standard exercise protocols and the aggressive use of modalities such as cross friction massage, ice, ultrasound, and electrical stimulation, with progression to weight training, non-impact and impact aerobics. The program finishes when the member demonstrates the ability to accomplish specific functional skills, and an understanding of how to prevent future injury.

In 1990 the Navy committed to developing SMART Centers. In 1992 the Navy Sports Medicine Fellowship was developed as the pipeline to produce subspecialty trained Sports Medicine Physicians to lead these SMART Centers. Subsequent documented SMART Center successes included decreased attrition and lost training days at Navy and Marine Corps Training Commands, decreased use of radiological studies, and fewer orthopedic consults. Dollar savings in the millions were reported. Research and education programs also grew from these SMART Centers. Despite unquestionable successes, implementing and sustaining SMART Centers has been difficult as three critical elements (an active duty Sports Medicine Physician, local command support, and funding) are not always simultaneously present/available. The fellowship is one year in length and produces 1-3 active duty Sports Medicine physicians per year. These physicians may go on to spend their entire Sports Medicine utilization tour fighting for space, staff, funding and command support unable to ever attain full effectiveness. Such is the case in locations where SMART Centers have initially been unable to take hold or degenerated after some period of success. Sustainability has been a key issue despite endorsement at the highest levels of Navy medicine. General countercurrents include local asset starvation, diversion of resources to solve short term problems in other areas, accelerated rotation/reassignment of required personnel, or absorption of assets into a larger, less focused department.

d. The surgical treatment and rehabilitation of operative injury in the Navy and Marine Corps population is second to none at the hospital level. However, “deck plate” and outpatient clinic treatment of the common shipboard and training injuries has not kept pace with the needs of the Sailors and Marines despite efforts over the past 12 years as described above. Specific reasons include:

1) There is a general lack of awareness pier side of the necessary time, personnel, equipment and facility requirements to efficiently treat musculoskeletal injuries. Program resourcing for space, personnel, equipment and expendable items is not standardized at the BUMED level for distribution to local commands as Sports Medicine and SMART Centers are still relatively new.

2) The assumption exists that the presence of hospital corpsmen, Independent Duty Corpsmen and General Medical Officers (GMO) meet the personnel requirement. Although the vast majority of orthopedic overuse injuries

encountered aboard ship are common and treatable as outpatient injuries, the corpsmen, IDC and GMO training in this field is limited and/or sporadic.

3) There is inherent resistance to change from the traditional medical model. The traditional appointment based, one-on-one approach to patient care may be appropriate for the sick, but is inefficient and outdated when applied to the needs of the injured active duty member. Once the initial inertia to a team approach to injury care is overcome on a large enough scale, this system of ongoing prevention, training, evaluation and treatment at the local level will be widely accepted, requested and even demanded by the line and medical communities.

4) There is a regular turnover of personnel. GMO's rotate on average every two years, corpsmen every two – three, and orthopedic surgeons every two – four years. This is built into the system. Due to this high level of turnover, the awareness of the impact of a sports medicine program is lost. In addition some commands rotate personnel from location to location every 6-12 months locally, accelerating the erosion of corporate memory even faster.

5) There exists a general lack of understanding regarding the standard of care for treating and reconditioning shipboard and training injuries. A premature return to full duty prior to full healing will lead to a recurrence or exacerbation of the original injury. Conversely, long delays between injury and accurate diagnosis, lack of aggressive reconditioning, and the absence of a definitive plan for the return to duty often causes the active duty member to become discouraged and demotivated. Shipboard and training injuries not accurately diagnosed or aggressively treated have the potential to plague the sailor and his unit for years.

6) The absence of primary care musculoskeletal injury specialists and a reconditioning facility near the training areas and pier presents an impediment to rapid return to duty. Many Sailors do not have personal vehicles, and even for those who do, getting from the ship to a medical facility and back is logistically difficult especially with parking space at a premium and force protection measures in place. A common complaint from shipboard and shore commands is that a simple fifteen-minute appointment with medical will cause the member to be away from his/her duty station for the majority of the day.

7) In the current health care system, standard appointment scheduling often creates unnecessary delays in access to care which results in delayed diagnosis and treatment slowing return to full duty for injured service members.

## DISCUSSION

Plans exist for the expansion of the SMART Center concept at multiple (particularly Marine Corps) locations. Sports Medicine billets are potentially expanding from 10 to about 24, but the training pipeline has not yet opened up. Filling the deficit with civilian Sports Medicine physicians is clearly an option, but less desirable as maximizing the application of Sports Medicine to the military population requires an understanding gained only through military service and there exist few civilian Sports Medicine physicians with prior service. The relative paucity of active duty Sports Medicine physicians is problematic. Implementing a SMART Center without a Sports Medicine physician is like trying to start a professional football team without a franchise quarterback. Sports Medicine represents an entire specialty focused on keeping the athlete/service member in <u>their</u> game by coordinating the efforts of the musculoskeletal health care team around the patient. No other field or specialty has this focus or the breadth of training required to lead the musculoskeletal health care team in SMART Center development and operation. Surely it would have been done it long ago by any of the well-established fields/specialties if this were the case. SMART Centers may have to grow at the rate that active duty Sports Medicine physicians become available to lead them and this rate needs to be increased. Regionalization is a method of establishing SMART Centers in one area and holding onto gains as expansion occurs to increase benefits to the fleet and optimize resource use in Navy Medicine. A SMART Center was established on 25 February 2002 at BMC-MCRD for the benefit of Marine Corps Recruit Depot. Expanding the concept to benefit Naval Station San Diego, particularly afloat personnel, is the next step.

Implementing a SMART Center pier side has not yet been done, but the project is being pursued in Pearl Harbor, Hawaii. In San Diego, there are about 35,000 plus sailors stationed aboard ships home ported at Naval Station and another 25,898 on shore duty pier side. Using published injury incidence and associated morbidity data for shipboard personnel, there are about 110,000 new injuries, 4.6 million light duty days, and 1.1 million lost workdays in this population due to musculoskeletal injuries. Throughout the military this issue so huge it is difficult to quantify, but there are over 1100 Physical Evaluation Boards yearly from the Marine Corps for musculoskeletal injuries at a cost of millions of dollars per year to the taxpayer. At MCRD San Diego the annual cost of

musculoskeletal injuries easily exceeds $20 million dollars with over 80,000 associated lost training days. In one report of patients medically evacuated from the Persian Gulf war for musculoskeletal injuries, 50% turned out to be non-debilitating and resulted in immediate return to full duty. During recent transit through Hawaii the Carl Vinson Battle group, in port for only four days (30 Jan – 2 Feb), had 1136 patient interactions and consults processed/disposed at the local military treatment facility. The top diagnoses were musculoskeletal, dermatological, and lab work.

## CONCLUSION

The potential benefits in readiness, resource utilization, and quality of service for our active duty members is so enormous it is nearly immeasurable. The support of the SMART concept is truly a multimillion-dollar lesson we cannot afford to learn over and over at various locations through the isolated Fort Apache approach to implementation. Risking failure through local passive non-support, active covert countercurrents or inadvertent resource diversion is no longer an option at any location. Success depends on the ability to align resources in a stable manner that will permit SMART Centers to take hold and grow in their effectiveness. Here at NMCSD we can lead the way and be the nidus about which the crystal of efficiency forms in musculoskeletal injury management through Regionalization of the SMART Center concept and Institutionalization of Sports Medicine as the specialty to do it. Our next step is to get our feet wet at Naval Station San Diego in support of the fleet.

## RECOMMENDATIONS/PLAN

1. Use existing Optimization Funds towards finishing the SMART Center under development at BMC-MCRD
2. Task the Sports Medicine Physician at BMC-MCRD with leading a team in developing a plan for establishing a wet side SMART Center at Naval Station San Diego
3. Collect input from members of various NMCSD Directorates as required
4. Initiate contact with fleet medical personnel to discuss the potential for benefit to the fleet
5. Initiate contact with Naval Station San Diego Commanding Officer to ensure support and help
6. Move towards development of a wet side SMART Center by implementing pilot on dry side
7. Develop a Products and Services Proposal
8. Define Scope of Implementation plan
9. Develop a phased implementation plan
10. Delegate components of the plan
11. Commit and Move ahead
12. Request additional funding as needed

THOMAS A. BALCOM
CDR, MC, USN

**NAVAL MEDICAL CENTER SAN DIEGO**
**PROPOSAL FOR IMPLEMENTATION OF SPORTS MEDICINE AND RECONDITIONING TEAM (SMART) CENTER PIERSIDE AT NAVAL STATION SAN DIEGO**

## 1. SPECIFIC AIM

a. The overall mission of this project is to optimize the delivery of health care at Naval Medical Center San Diego in treating musculoskeletal injuries occurring primarily in the active duty population in San Diego by expanding the SMART Center concept.

## 2. PROGRAM GOALS (Current readiness, Future Readiness, Manpower, Alignment, Quality of Service)

a. Provide *convenient, early access* to *specialty level care* for evaluation and treatment of musculoskeletal injuries occurring in shipboard and pier side personnel at Naval Station San Diego.
b. *Accurately sort out* those who could benefit most from early surgical intervention, provide *only quality consults to orthopedics*, and increase proportion of orthopedic surgeons time spent in the operating room.
c. Provide the *standard of care* for *treatment, aggressive reconditioning* and *injury prevention education* to the injured individual in which a non-surgical approach would be more appropriate.
d. *Accelerate the expected return to duty time*, with a reduction in light duty days.
e. *Reduce* the requirement for *disability evaluations* (Physical Evaluation Boards) and subsequent *attrition rate* from the Navy due to musculoskeletal injuries.
f. Establish and maintain *injury surveillance* and *research initiatives* having the greatest potential for *practical military application*.
g. *Optimize use of human and radiological resources* at Naval Medical Center San Diego freeing assets to provide more patient care to the San Diego military community in other areas.
h. Establish and maintain an *education and training program* in the discipline of Sports Medicine for General Medical Officers, Medical Residents, Medical Students, Physician Assistants, Independent Duty Corpsmen and general duty corpsmen.
i. *Establish Efficient Information Flow* between elements of the line community, the SMART center, and San Diego area medical treatment facilities.
j. *Regionalize the SMART Center concept* to maintain continuity of care by linking with Naval Station Pearl Harbor SMART Center to share information, standardize health care delivery, and coordinate access to care for San Diego personnel passing through Pearl Harbor as they prosecute the war overseas.

## 3. BENEFICIARY NEED

For Persons Stationed aboard ships:

11.9 injuries/100 man-months = total incidence of newly diagnosed musculoskeletal injuries in shipboard personnel. This includes acute (2.6 injuries/100 man-months) and overuse (9.3 injuries/100 man-months).

Acute musculoskeletal injuries resulted in 79 Lost Work Days/100 man-months and 192.5 Light Duty Days/100 man months. Another way to look at this is to say that on average each acute musculoskeletal injury resulted in 30.4 Lost Work Days and 74.0 Light Duty Days.

Overuse musculoskeletal injuries resulted in 1 Lost Work Day/100 man-months and 255.5 Light Duty Days/100 man months. Another way to look at this is to say that on average each overuse musculoskeletal injury resulted in 0.1 Lost Work Days and 27.5 Light Duty Days.

Population at Risk:
There are 35,000 Sailors and Marines stationed aboard Surface Force Pacific Fleet Ships
35,000 Sailors and Marines x 12 months/year = 420,000 man-months/year at risk for injury

Acute Injuries:
420,000 man-months/year x 2.6 injuries/100 man-months = 10,920 acute injuries/year
10,920 acute injuries/year x 30.4 Lost Work Days/injury = 331,968 Lost Work Days/year from acute injury
10,920 acute injuries/year x 74.0 Light Duty Days/injury = 808,080 Light Duty Days/yr from acute injury
Overuse Injuries:
420,000 man-months/year x 9.3 injuries/100 man-months = 39,060 overuse injuries/year
39,060 overuse injuries/year x 0.1 Lost Work Days/injury = 3,906 Lost Work Days/yr from overuse injury
39,060 overuse injuries/year x 27.5 Light Duty Days/injury = 1,074,150 Light Duty Days/yr fm overuse

For persons stationed ashore:

Overuse injury incidence and associated morbidity is assumed to be the same as for persons stationed aboard a ship. Acute musculoskeletal injury morbidity is assumed to be the same as for persons stationed aboard a ship. However, an adjustment must be made regarding incidence of acute musculoskeletal injuries ashore.

For persons stationed aboard ships the relative risk of sustaining an acute musculoskeletal in port is 3.5 times greater than for sustaining an acute musculoskeletal injury at sea. The incidence of acute musculoskeletal injury in persons stationed ashore is assumed to be the same as for those persons stationed aboard ships while in port. (2.6 acute injuries/100 man-months x 3.5 = 9.1 acute musculoskeletal injuries/100 man-months). The increased risk/incidence of acute musculoskeletal injury while not at sea is probably associated with an increased opportunity to participate in recreational sports and availability of alcohol.

Population at Risk:
There are 25,898 persons stationed ashore at Naval Base San Diego.

Acute Injuries:
25,898 persons x 12 months/year = 310,776 man-months/year at risk for injury.
310,776 man-months/year x 9.1 injuries/100 man-months = 28,281 acute injuries/year
28,281 acute injuries/year x 30.4 Lost Work Days/injury = 859,742 Lost Work Days/year from acute injury
Overuse Injuries:
28,281 acute injuries/year x 74.0 Light Duty Days/injury = 2,092,794 Light Duty Days/yr from acute injury
310,776 man-months/year x 9.3 injuries/100 man-months = 28,902 overuse injuries/year
28,902 overuse injuries/year x 0.1 Lost Work Days/injury = 2,890 Lost Work Days/yr from overuse injury
28,902 overuse injuries/year x 27.5 Light Duty Days/injury = 794,805 Light Duty Days/yr fm overuse

Totals combined for persons stationed afloat and ashore:

60,898 persons to be served

39,201 acute injuries/yr → 1,191,710 Lost Work Days/yr and 2,900,874 Light Duty Days/yr
67,962 overuse injuries/yr → 6,796 Lost Work Days/yr and 1,868,955 Light Duty Days/yr
**107,163 ms injuries/yr → 1,198,506 Lost Work Days/yr and 4,769,829 Light Duty Days/yr**

107,163 new ms injuries per yr x (0.39 referral rate) x 2.5 patient encounters/new injury
patient encounters per year at the SMART Center=84,788

Current Situation:

Branch Medical Clinic (BMC) Naval Station currently sees about 17,000 visits per year for musculoskeletal injuries spread among various providers. BMC-MCRD currently sees about 2000 patient visits per year for musculoskeletal injuries occurring in local Navy personnel. BMC at Point Loma (BMC-NTC) has an ambulatory orthopedics clinic, which also sees at least 2000 non-surgical patient visits per year for musculoskeletal injuries. NMCSD orthopedics and physical therapy clinics provide visits for fleet and pier side personnel that are presumed to total potential musculoskeletal visits above that could be seen at BMC NAVSTA dry side in a SMART Center is approximately 25,000 right now and is to exceed 4000 visits per year for non-surgical musculoskeletal injuries.

Conclusion:

The calculated beneficiary need/potential number of visits per year (84,788) significantly exceeds the current total number of visits (25,000 +) occurring at the named clinics. The potential to be overwhelmed at a pier side SMART Center is very real.

## 4. PROJECTED NEEDS FOR SMART CENTER IMPLEMENTATION

Needs of the SMART Center are based on the mission, population to be served, scope of service, resultant estimations of workload, and contingency plans. Facilities, space, personnel, and cost are all driven by number of anticipated patient encounters. The potential to be overwhelmed with patients is very real. The temptation to create an unworkable facility is also just as real. A partial commitment to the facility would be like leaping halfway across a crevice because we are too afraid to jump hard enough to clear it. Expecting that if all goes well to the halfway point we can then fully commit will only result in creating a facility that is rapidly obsolete plummeting us into failure. We must start not only with the end in mind, but also with contingency plans for expansion in the patient workloads as the population base increases due to popularity or upsizing in the Navy. Implementing in a stepwise manner by calculated leaps to sustainable plateaus of progress with the assumption of greater workloads from other areas (BMC-NAVSTA, BMC-MCRD, BMC-NTC, NMCSD Orthopedic Clinics) will be the key to success as we move closer to full wet side implementation.

a. BMC-MCRD San Diego has 60,526 square feet and has seen up to 74,000 patient visits per year. This represents 814 square feet per 1000 patient visits per year.

b. Modifying DOD Medical Space Planning Criteria to fit the SMART Center Concept implementation at a recruit-training depot resulted in an estimation of 13472 square feet to serve 32,000 patient visits per year. This represents 421 square feet per 1000 patient visits per year.

c. During recent planning to build a stand alone SMART Center at MCRD San Diego fiscal constraints of project design forced considerations of the smallest workable dedicated square footage that would be effective. This lead to the estimation of 11250 square feet to serve 32,000 patient visits per year so long as the building was immediately adjacent to the BMC-MCRD in case of patient overflow and for relatively easy access to radiology. This represents 352 square feet per 1000 patient visits per year without radiology facilities. I believe this to be tight.

d. In Pearl Harbor they are moving ahead with SMART Center plans to use 14,800 square feet to see an estimated 21,969-31,359 patient visits per year. This represents 472-673 square feet per 1000 patient visits per year. Clearly they are starting with the end in mind in space considerations.

Needs:

These are shown on enclosed spreadsheet using 421 square feet per 1000 patient visits per year.

**Facilities and Equipment**

Comments:

An ideal facility at Naval Station San Diego would be centrally located on the wet side near the waterfront so that patients could walk to it. It would be near a large parking area for those who must drive and would be on the ground level. The pier six area is ideal. The facility would need a radiology suite so that patients would not have to waste time transiting to the dry side. It would also have computer connectivity with the ships at Naval Station, the SMART Center in Hawaii, Naval Medical Center San Diego, Camp Pendleton Naval Hospital and Marine Corps units.

Needs:

At this point no ideal space has been identified on the wet side. There is a significant amount of underutilized space in the pier two area across from the USNS Mercy with minimal convenient parking. Most of this is 2nd deck level. Buildings in the pier six area are small and currently occupied.

**Personnel**

Benchmarks:

a. BMC-MCRD has a staff of over 100 and has seen a maximum of 74,000 patient visits per year. This represents 1 FTE per 740 patient visits per year.

b. At times of documented success SMART Centers have been staffed with a ratio of 1 FTE per 1000 patient visits per year to 1 FTE per 1250 patient visits per year. The SMART Center at BMC-MCRD is in the process of being implemented with the 1:1250 ratio. This is probably adequate for recruit training facilities, but the 1:1000 ratio might be more appropriate for pier side SMART Centers due to a larger variety and more chronic nature of the musculoskeletal problems that present in a non-recruit population.

Needs:

FTE needs are shown on the enclosed spreadsheet using the 1:1250 ratio.

Comments:

Since workload would be shifted away from clinics some personnel could follow, but certain specialist staff would need to be hired.

**Cost**

Facilities:

The first option is to modify an existing facility.
The second is to build one.

Benchmarks:

a. Pearl Harbor is planning to take advantage of an old library 1200 yards from the pier and across the street from radiology facilities. Cost of repairs and modifications are estimated at $110,000. They will be doing about 20,000-30,000 patient visits per year.

b. MCRD made plans to build an 11250 square foot SMART Center building at a cost of 2.74 million dollars or $244 per square foot.

Needs:

a. Modifying an existing facility would be cheaper, but may prove limiting depending on multiple factors discussed above (ex: parking, location). Actual cost would be dependant on the facility and modifications made. Radiology capability may be costly and more money may be available for this if an existing structure is modified. Research required here. Cost to install radiology facility capable of doing 6000 patients per year is unknown at this point.

b. Cost of Building shown on enclosed spreadsheet is based at $244/square feet.

c. Cost to modify non-medical building assumed to be $100 per square foot.

d. Cost to modify medical building assumed to be $5 per square foot based on modification to MCRD.

**Equipment**

Benchmarks:

a. Pearl Harbor's projected cost of fixed equipment and information management systems is $85,000 and $17,000 respectively. Total is $102,000 for a center starting at about 20,000 patient visits per year or $5.10 per patient visit per year in start up costs for equipment.

b. At BMC-MCRD San Diego value of equipment required to do 32,000 patient visits per year was estimated at about $253,875 or $7.81 per patient visit per year in start-up costs for equipment.

c. At Camp Pendleton SMART Center initial start-up cost was about $90,000 to do about 10,000 patient visits per year the first year for a cost $ 9.00 per patient visit per year in start-up costs for equipment.

Need:

Using the mid range value of $7.65 per patient visit per year for start-up equipment costs results in the following.

a. To serve all 60,898 persons afloat and ashore at Naval Station San Diego with an estimated 80,372 patient visits per year would require $614,845.

b. To serve only those 35,000 Sailors and Marines stationed aboard Surface Force Pacific Ships with an estimated 37,485 visits per year ((10920 acute + 39060 chronic) x 0.3 x 2.5 = 37,485) would require $286,760.

c. To serve only those 25,898 persons stationed ashore with 42,887 visits per year (80,372 - 37,485 = 42,887) would require $328,085.

**Supplies:**

Benchmark:

In 1996 the SMART Center at Camp Pendleton opened with an OPTAR of $1.50 per patient visit per year and was successful. Taking inflation into account at 3.5 % per year the current figure equates to $1.84 per patient visit per year.

Needs:

Shown on enclosure using $1.84

**Personnel**

Benchmarks:

Cost to hire varies widely and depends on position to be filled and method of hiring. Average cost of one generic contracted FTE is $ 57,000 per year per Contracting Officers Representative Course 14-17 May 2002.

Needs:

Assume ½ of Required FTE's must be hired at an average cost of $57.00 per FTE.

## 5. RETURN ON INVESTMENT & OUTCOMES

Payback/Cost Savings – less X-rays and MRI's will be needlessly ordered
Capacity and Managed Care – FTEs will be opened up at other clinics for more general primary care.
Impact on other Directorates/Departments – less needless orthopedic consults
Impact on Readiness – less time away from work for sailors afloat. Moral builder.
Intangible – teaching, data collection, prevention efforts. Benefits will not be realized for some time.

Comments:

Return on investment may be difficult to calculate because the projected need for expert musculoskeletal injury care greatly exceeds the resources to provide it. Until resources match need and the Navy health care system adapts to this relatively new, more effective concept in the management of primary care musculoskeletal injuries new SMART Centers will grow to capacity very quickly and become overwhelmed. The greatest challenge will be sustaining support over the time required to get ahead of the musculoskeletal injury management problem. The larger the area of implementation, the longer the time required to implement and the more complicated it becomes to

show return on investment with significant granularity. Implementing within Naval Medical Center San Diego Primary Care Directorate is complicated enough to require dedicated resources to establish and track all the appropriate measures of effectiveness/outcomes. Navy Health research center (NHRC) has experience doing this type of analysis and has expressed interest in assisting. Teaming with NHRC, the Directorate of Health Care Operations and the implementation team together would facilitate outcome measurement. Results may take several years or more to collect due to the scope of the efforts.

**6. ALTERNATIVES**

Range from do nothing to halting anywhere along the stepwise implementation.

**7. CONCEPT OF OPERATIONS AND STEPWISE IMPLEMENTATION PLAN**

a. The plan will be to establish SMART Centers in 3 locations that function as a network. The locations will be BMC MCRD, BMC NAVSTA dry side and BMC NAVSTA wet side. Establishment of BMC NAVSTA SMART Centers will occur as an outgrowth from that already established at BMC MCRD. In the final state, BMC MCRD will focus on serving the population at MCRD, the dry side SMART Center will serve primarily active duty persons stationed ashore on the dry side at NAVSTA, the wet side SMART Center will serve persons stationed ashore on the wet side and afloat personnel. Once established, the dry side SMART Center will potentially be able to accept a significant number of consults from surrounding areas. At this point, plans for expansion of the SMART Center concept to other locations may need to be considered based on referral patterns.

b. Getting to the end state from the current situation will be a challenge. A SMART Center has recently been established at BMC MCRD but exists at none of the other locations above. The end state need at BMC MCRD will be for about 32,000 patient visits a year, at NAVSTA dry side the need will be about 50%of ashore NAVSTA visits or 18,029 patient visits per year plus consults from other areas. At NAVSTA dry side the need will be for about 66,760 (18,029 + 48,731) patient visits per year. This includes all visits for afloat personnel and the 50% of ashore personnel at NAVSTA on the wet side. A phased approach will be required.

These are the steps:

Phase 1- Solidify SMART Center at MCRD.
Phase 2- Focus SMART mission at MCRD to MCRD. Establish pilot SMART Center at dry side NAVSTA. Pursue location issue on wet side.
Phase 3- Establish location for wet side SMART at NAVSTA. Define scope of services to be provided at wet side SMART and request funding as needed for facilities and personnel.

Each phase must be implemented in a sustainable manner that can be maintained indefinitely until resources are available to move to the next phase. Assets currently available fall far short of those required for full implementation, but may be enough to enter phase 2 with command support and careful planning so long as this is within the scope of use for current optimization funds.

T. A. BALCOM
CDR, MC, USN

To varying degrees this plan was created using input, data, text, presentations, publications, and ideas obtained from multiple sources including, but not limited to:

CAPT Joe Moore, MC, USN – CO Naval Medical Clinics, HI, Senior Sports Medicine Physician in the Navy
CDR Scott Flynn, MC, USN – Sports Medicine Specialty Advisor
CDR Arletta Fryslie, NC, USN – Currently on Directorate of Primary Care Staff at NMCSD
CDR Louis Louk, MSC, USN – Podiatrist and Assistant Officer in Charge (OIC) of BMC-MCRD
CDR Bruce Menely, MC, USN – Current Amphibious Group 3 Medical Officer, Naval Station, San Diego
CDR Gerry Murphy, MC, USN – Current Regional Support Medical Officer, Naval Station, San Diego
CDR Kevin Seuffert, MC, USN – Sports Medicine Department Head at Naval Hospital Camp Pendleton (NHCP)
CDR Kelly Skanchy, MC, USN – SMART Center OIC at USMC School of Infantry (SOI) West, Camp Pendleton
CDR Dave Tam, MC, USN – Directorate of Primary Care, NMCSD
CDR Jamie Whiteman, MSC, USN – Former Administrative Officer at Surface Force Pacific Medical
CDR Gregg Ziemke, MSC, USN – Current Physical Therapy Department Head at NMCSD
LCDR Keith Steussi, MC, USN – Sports Medicine MD attempting to develop a SMART Center at USMC SOI East
LT Mark Gilford, MSC, USN – PA at BMC-NAVSTA pursuing Masters Degree with Sports Medicine emphasis
LT Elizabeth Greenway, MSC, USN – Physical Therapist/Athletic Trainer assisting with development of SMART Center in HI
Mr. Tom Ropel (formerly Capt Ropel, USMC) – previous Special Training Company Officer at MCRD San Diego