



VIPER: Operationalizing Musculoskeletal Injury Care

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Finance III

6 February, 2015



Disclaimer

The views expressed in this article are those of the authors and do not reflect the official policy or position of Baylor University, the Department of Defense, or the U.S. Government. This report provides approximations of important financial consequences considered in decisions involving the impact of the Air Force VIPER Program. The project team based the analysis on information provided by our points of contact at the 559th Medical Group, as well as information believed by 559th Medical Group staff to be accurate. We recommend that you use this analysis only as an aid to develop your own cost and benefit analysis.



Agenda



- Issues
- Courses of Action
- Assumptions
- Recommendations



Issues



- **Problem:** Musculoskeletal injuries in the Medical Holding Company **cost the Air Force \$12.6M/year¹**
- Sports medicine models have been effective in other military branches
- **Question:** What action can the Air Force take to reduce the cost of Medical Hold and musculoskeletal injuries?

¹Nye, N. (2014, December 1). VIPER: Operationalizing musculoskeletal care. San Antonio, Texas, United States of America: Unpublished Presentation.

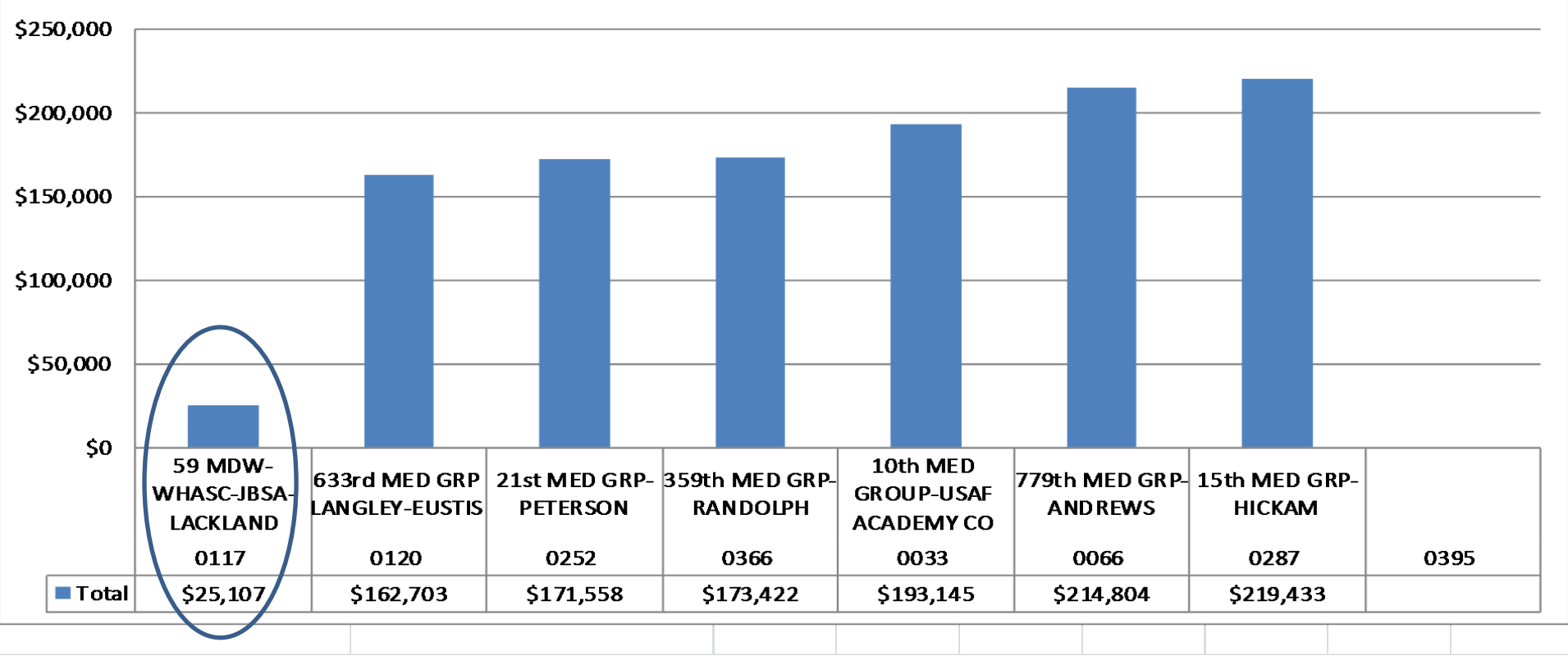


Current PT Performance



- Lackland PT underperforms compared to its AF peers²

Value per FTE



²United States Army Medical Command. (2014, May). Practice management revenue model 3.0 . *User guide*. San Antonio, Texas, United States of America: United States Army Medical Command.



Courses of Action



- **COA 1:** Status quo - Business as usual: no change to current gatekeeper medical model

- **COA 2:** Optimize current Physical Therapy program / aggressively target MedHold population

- **COA 3:** VIPER (4 ATs)

Hub/MedHold:

Sports MD/DO: 2-3

Exercise Physio: 1

Med Tech (4N): 2-4

PT: 2

AT: 2

PT Techs: 4-6

Rad Tech: 1

Ortho/Podiatry: 1-2

Med Tech (4A): 1-2

Spoke/BMT

Squadron:

AT: 2

IDMT: 1

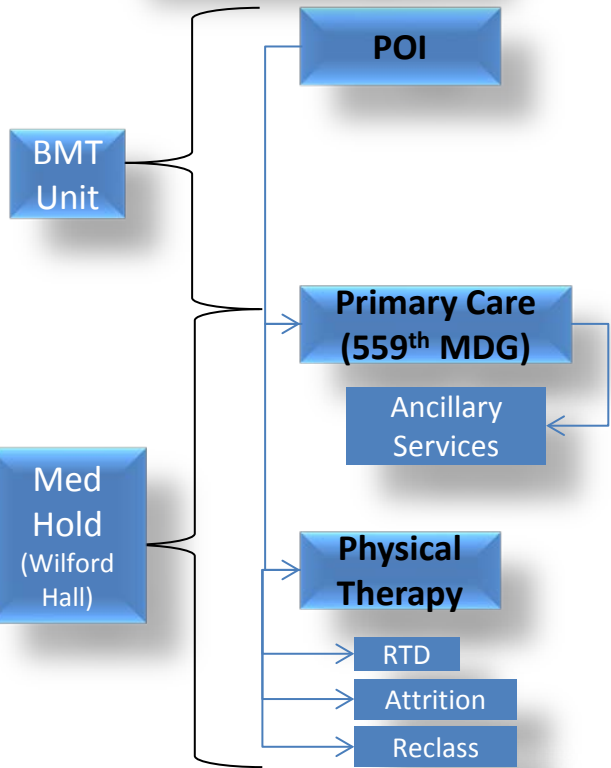


Courses of Action

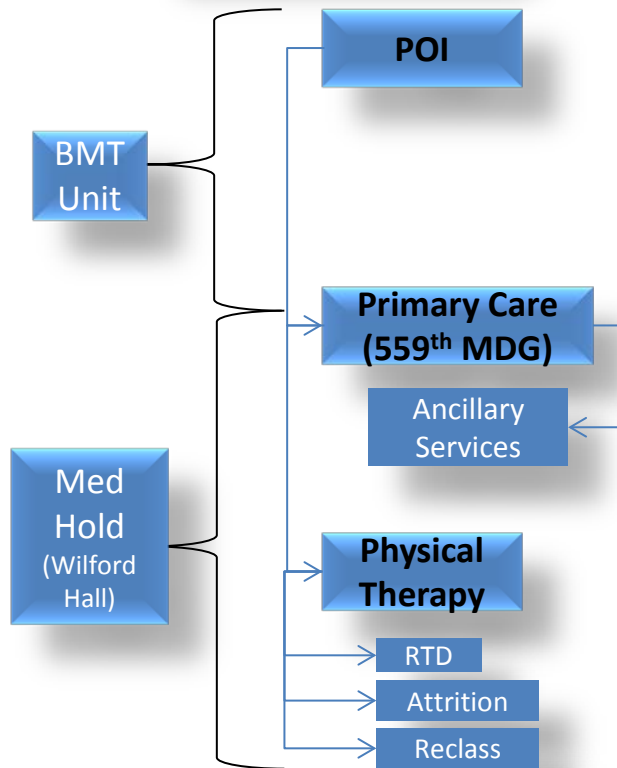
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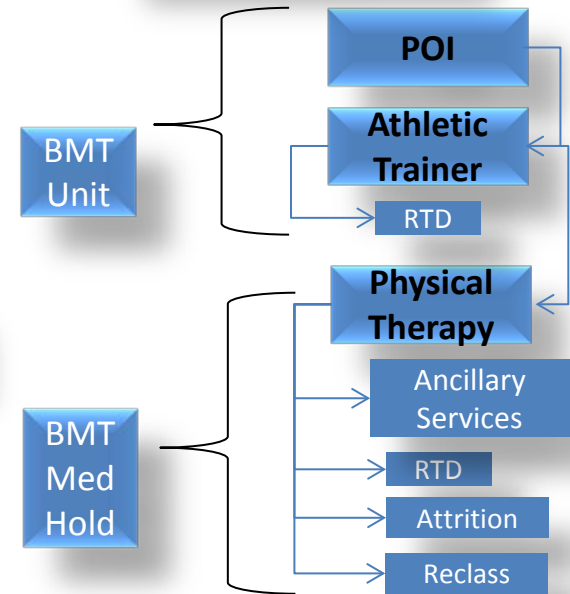
COA 1: Status quo



COA 2: Optimize PT



COA 3: VIPER



Additional Staffing:
 Sports MD/DO: 2-3
 Exercise Physio: 1
 Med Tech (4N): 2-4
 PT: 1-2
 PT Techs: 4-6
 Rad Tech: 1
 Ortho/Podiatry: 1-2
 Med Tech (4A): 1-2

Athletic Trainers 2
 IDMT 2

COA 1: Status quo



Courses of Action

COA 1: Status quo



- Cost of Trainees in MedHold^{3,4}

Current Cost of MSK Trainees in Med Hold

Sustainment Rate of Trainee	\$156.86
MilPay Inflation Factor	1.58%

Current Average Monthly Medhold Census	318
Percentage of MedHold for MSK Injury	66%
Current Avg Monthly MedHold for MSK Injury	209.88
Average Length of Stay in MedHold	32

$$\$156.86 \times 209.88 \times 32 = \$1.05M$$

Sustain Rate # MSK in MedHold Avg Days in MedHold

Year 1	Year 2	Year 3	Year 4	Year 5
(\$12,641,962.29)	(\$12,841,073.20)	(\$13,043,320.10)	(\$13,248,752.39)	(\$13,457,420.24)

Annualized cost plus MilPay Inflation Factor

³Manacapilli, T. (2012). *Reducing attrition in selected Air Force training pipelines*. Santa Monica: RAND Corporation.

⁴Nye, N. (2014, October 11). Talking paper on VIPER programmatic framework, roles, requirements and timelines. San Antonio, Texas, United States of America: Unpublished Manuscript.



Courses of Action

COA 1: Status quo



Air Force Combined Funding

	Year 1	Year 2	Year 3	Year 4	Year 5
AF O&M	(\$12,641,962.29)	(\$12,841,073.20)	(\$13,043,320.10)	(\$13,248,752.39)	(\$13,457,420.24)
AF DHP	(\$91,645.95)	(\$93,089.37)	(\$94,555.53)	(\$96,044.78)	(\$97,557.48)
TOTAL	(\$12,733,608.24)	(\$12,934,162.57)	(\$13,137,875.63)	(\$13,344,797.17)	(\$13,554,977.73)
NPV	(\$64,916,157.41)				

Air Force Operations & Maint. Dollars

Current Cost of MSK Trainees in Med Hold

Sustainment Rate of Trainee	\$156.86
MilPay Inflation Factor	1.58%
Current Average Monthly Medhold Census	318
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Year1	Year2	Year3	Year4	Year5
(\$12,641,962.29)	(\$12,841,073.20)	(\$13,043,320.10)	(\$13,248,752.39)	(\$13,457,420.24)

Air Force Defense Health Program Dollars

Current FY14 PT Program

Year 1	Year 2	Year 3	Year 4	Year 5
(\$91,645.95)	(\$93,089.37)	(\$94,555.53)	(\$96,044.78)	(\$97,557.48)

- Represents the annual operating loss in physical therapy for BMT
- Current PT expense per encounter ~\$109
- Current revenue per encounter ~\$98
- Losing ~\$11 per visit on ~8200 visits per year

COA 2: Optimize Physical Therapy



Courses of Action

COA 2: Optimize Physical Therapy^{5,6,7}



Current PT Demand w/Aggressive Treatment of Trainees in MedHold

$$\begin{array}{rcl}
 210 & \times & 9 & = & 1784 \\
 \# & & \# & & \text{Monthly} \\
 \text{MedHold} & & \text{Monthly} & & \text{MedHold} \\
 \text{MSK} & & \text{PT Visits/} & & \text{PT} \\
 & & \text{MedHold} & & \text{Demand} \\
 \\
 & & & & 1343 \\
 & & & & \text{Monthly} \\
 & & & & \text{Non-BMT} \\
 & & & & \text{PT} \\
 & & & & \text{Demand} \\
 \\
 \hline
 & & & & \mathbf{3127} \\
 & & & & \text{Total} \\
 & & & & \text{Monthly} \\
 & & & & \text{PT Clinic} \\
 & & & & \text{Demand}
 \end{array}$$

Current Capacity of PT

$$\begin{array}{rcl}
 8 & \times & 9 & \times & 20 & = & 1440 \\
 \# & & \# & & \# & & \text{Monthly} \\
 \text{PTs} & & \text{Patient/} & & \text{Work} & & \text{PT} \\
 & & \text{Day} & & \text{Day/} & & \text{Capacity} \\
 & & & & \text{Month} & & \\
 \\
 12 & \times & 7 & \times & 20 & = & 1680 \\
 \# & & \# & & \# & & \text{Monthly} \\
 \text{PT} & & \text{Patient/} & & \text{Work} & & \text{PT Tech} \\
 \text{Techs} & & \text{Day} & & \text{Day/} & & \text{Capacity} \\
 & & & & \text{Month} & & \\
 \\
 \hline
 & & & & & & \mathbf{3120} \\
 & & & & & & \text{Total} \\
 & & & & & & \text{Monthly} \\
 & & & & & & \text{PT Clinic} \\
 & & & & & & \text{Capacity}
 \end{array}$$

Revenue: 3120 visits x 2.8 RVUs x 12 Months x ~\$34/RVU = ~\$3.7M

Expense: 3120 visits x 12 months x ~\$109/visit = ~4.1M

Profit: (\$400K)

⁵Manacapilli, T. (2012). *Reducing attrition in selected Air Force training pipelines*. Santa Monica: RAND Corporation.

⁶Nye, N. (2014, October 11). Talking paper on VIPER programmatic framework, roles, requirements and timelines. San Antonio, Texas, United States of America: Unpublished Manuscript.

⁷United States Army Medical Command. (2014, May). Practice management revenue model 3.0 . *User guide*. San Antonio, Texas, United States of America: United States Army Medical Command.



Courses of Action

COA 2: Optimize Physical Therapy



Air Force Combined Funding

	Year 1	Year 2	Year 3	Year 4	Year 5
AF O&M	(\$4,803,945.67)	(\$4,879,607.81)	(\$4,956,461.64)	(\$5,034,525.91)	(\$5,113,819.69)
AF DHP	(\$658,526.66)	(\$444,621.57)	(\$451,833.89)	(\$459,165.05)	(\$466,617.04)
TOTAL	(\$5,462,472.33)	(\$5,324,229.38)	(\$5,408,295.53)	(\$5,493,690.96)	(\$5,580,436.73)
NPV	(\$26,943,329.80)				

Air Force Operations & Maint. Dollars

Estimated Cost "Savings" of MedHold Trainees Due Optimized Physical Therapy				
Year 1	Year 2	Year 3	Year 4	Year 5
(\$4,803,945.67)	(\$4,879,607.81)	(\$4,956,461.64)	(\$5,034,525.91)	(\$5,113,819.69)

- PT program will increase losses due to more visits
- Equipment will incur cost
- Cost of trainees in MedHold reduced by \$4.8M
- Net Present Value:(\$26.9 million) over 5 years

Air Force Defense Health Program Dollars Revenue and Expense

Optimized PT Revenue				
Year 1	Year 2	Year 3	Year 4	Year 5
\$3,680,135.55	\$3,738,097.69	\$3,796,972.73	\$3,856,775.05	\$3,917,519.25
Optimized PT Expense				
Year 1	Year 2	Year 3	Year 4	Year 5
(\$4,095,561.60)	(\$4,160,066.70)	(\$4,225,587.75)	(\$4,292,140.75)	(\$4,359,741.97)
Optimized PT Profit				
Year 1	Year 2	Year 3	Year 4	Year 5
(\$415,426.05)	(\$421,969.01)	(\$428,615.02)	(\$435,365.71)	(\$442,222.72)
Equipment & Maintenance Costs				
Year 1	Year 2	Year 3	Year 4	Year 5
(\$243,100.62)	(\$22,652.56)	(\$23,218.87)	(\$23,799.34)	(\$24,394.33)



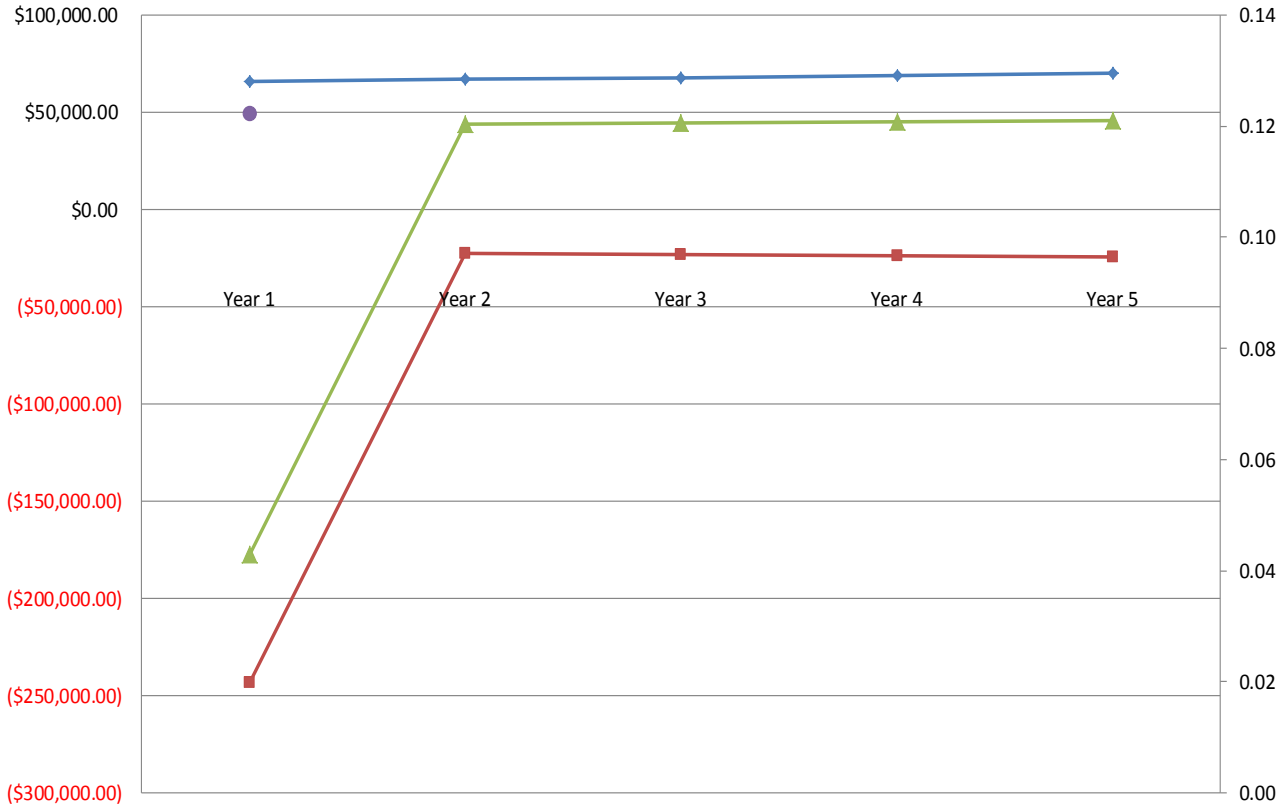
Courses of Action

COA 2: Optimize PT Breakeven



	Year 1	Year 2	Year 3	Year 4	Year 5		
Revenue	\$65,688.61	\$66,723.20	\$67,774.09	\$68,841.53	\$69,925.79	Average Census of BMTs	35,000.00
Expense	(\$243,100.62)	(\$22,652.56)	(\$23,218.87)	(\$23,799.34)	(\$24,394.33)	Percent who go to MedHold	0.91%
Total ROI	(\$177,412.01)	\$44,070.64	\$44,555.22	\$45,042.19	\$45,531.46	Number of BMTs to MedHold	318.00
NPV			0.12			Percentage in MedHold for MSK	66%
						Total Trainees in MedHold for MSK Injury	209.88
						Average Length of Stay in MedHold	32.00
						Effectiveness of Optimized PT in Reducing Days in MedHold	3.8%
						Projected Number of Days in MedHold	30.78

Optimized PT Program Revenue / Expense & ROI



Break Even:

- 35,000 BMT trainees per year
- 210 (0.60%) in MedHold for MSK injuries
- Optimize PT, we see a 2.8% reduction in the number of days a trainee is kept in MedHold to heal
- 2nd order effects: reduced recycle, improved morale, increased throughput

COA 3: VIPER



Courses of Action

COA 3: VIPER



- VIPER is expected to reduce admission to MedHold by 22% and reduce recovery time by 38%.^{8,9,10}
- This results in ~164 BMTs in MedHold for only ~20 days.

Number of Contract FTEs	4.00
Contractor Cost per FTE	\$84,000.00
Contract Pay Inflation Factor	2.89%

$$4 \times \$84,000 = \$336,000$$

Contract FTEs Cost per FTE

Average Census of BMTs	35,000
Percent who go to MedHold	0.91%
Number of BMTs to MedHold	318
Percentage in MedHold for MSK Injury	66%
Total Trainees in MedHold for MSK Injury	210
Effectiveness of VIPER in preventing admission to MedHold	22%
Projected number of Trainees in MedHold for MSK	164
Current Average Length of Stay in MedHold	32
Effectiveness of VIPER in Reducing Days in MedHold	38%
Projected Number of Days in MedHold	20

$$35,000 \times 0.91\% = 318 \times 66\% = 210$$

Avg Census of BMTs % to MedHold BMTs to MedHold % MSK Injuries in MedHold MSK Injury in MedHold

$$210 - 46 = 164$$

BMT w/MSK Injury in MedHold 22% of MSK Injuries in MedHold MSK Injury in MedHold after VIPER

$$32 - 12 = 20$$

Avg Length of Stay in MedHold 38% Reduced Days in MedHold # Days in MedHold

⁸Manacapilli, T. (2012). *Reducing attrition in selected Air Force training pipelines*. Santa Monica: RAND Corporation.
⁹Nye, N. (2014, October 11). Talking paper on VIPER programmatic framework, roles, requirements and timelines. San Antonio, Texas, United States of America: Unpublished Manuscript.
¹⁰Masters, D. (2003). *Sports medicine and rehabilitation team clinic: Comparative model analysis of Navy and Marine Corps options*. Falls Church: TRICARE Management Activity.



Courses of Action

COA 3: VIPER



Air Force Combined Funding ROI

	Year 1	Year 2	Year 3	Year 4	Year 5
AF O&M	(\$6,528,309.33)	(\$6,631,130.20)	(\$6,735,570.50)	(\$6,841,655.74)	(\$6,949,411.81)
AF DHP	(\$605,757.58)	(\$395,439.77)	(\$406,423.57)	(\$417,716.99)	(\$429,328.83)
TOTAL	(\$7,134,066.91)	(\$7,026,569.97)	(\$7,141,994.07)	(\$7,259,372.73)	(\$7,378,740.64)
NPV	(\$35,510,603.82)				

Air Force Operations & Maint. Dollars

Estimated Cost "Savings" of MedHold Trainees Due to VIPER

Year 1	Year 2	Year 3	Year 4	Year 5
(\$6,528,309.33)	(\$6,631,130.20)	(\$6,735,570.50)	(\$6,841,655.74)	(\$6,949,411.81)

Difference in original cost, to, as shown in previous slide , - 164 BMTs/month x 12 months x 20 day MedHold x \$156.86

- Current PT revenue will decrease
- VIPER ATs will make revenue
- Contractors and equipment incur expense
- Cost of BMT in MedHold reduced by \$6.5M
- Net Present Value: (\$35.5 million) over 5 years

Air Force Defense Health Program Dollars Revenue and Expense

PT Program ROI Data After VIPER

Year 1	Year 2	Year 3	Year 4	Year 5
(\$56,820.49)	(\$57,715.41)	(\$58,624.43)	(\$59,547.76)	(\$60,485.64)

VIPER Workload Generation

Year 1	Year 2	Year 3	Year 4	Year 5
\$30,163.52	\$30,638.60	\$31,121.16	\$31,611.32	\$32,109.19

Contract Personnel Costs

Year 1	Year 2	Year 3	Year 4	Year 5
(\$336,000.00)	(\$345,710.40)	(\$355,701.43)	(\$365,981.20)	(\$376,558.06)

Equipment & Maintenance Costs

Year 1	Year 2	Year 3	Year 4	Year 5
(\$243,100.62)	(\$22,652.56)	(\$23,218.87)	(\$23,799.34)	(\$24,394.33)



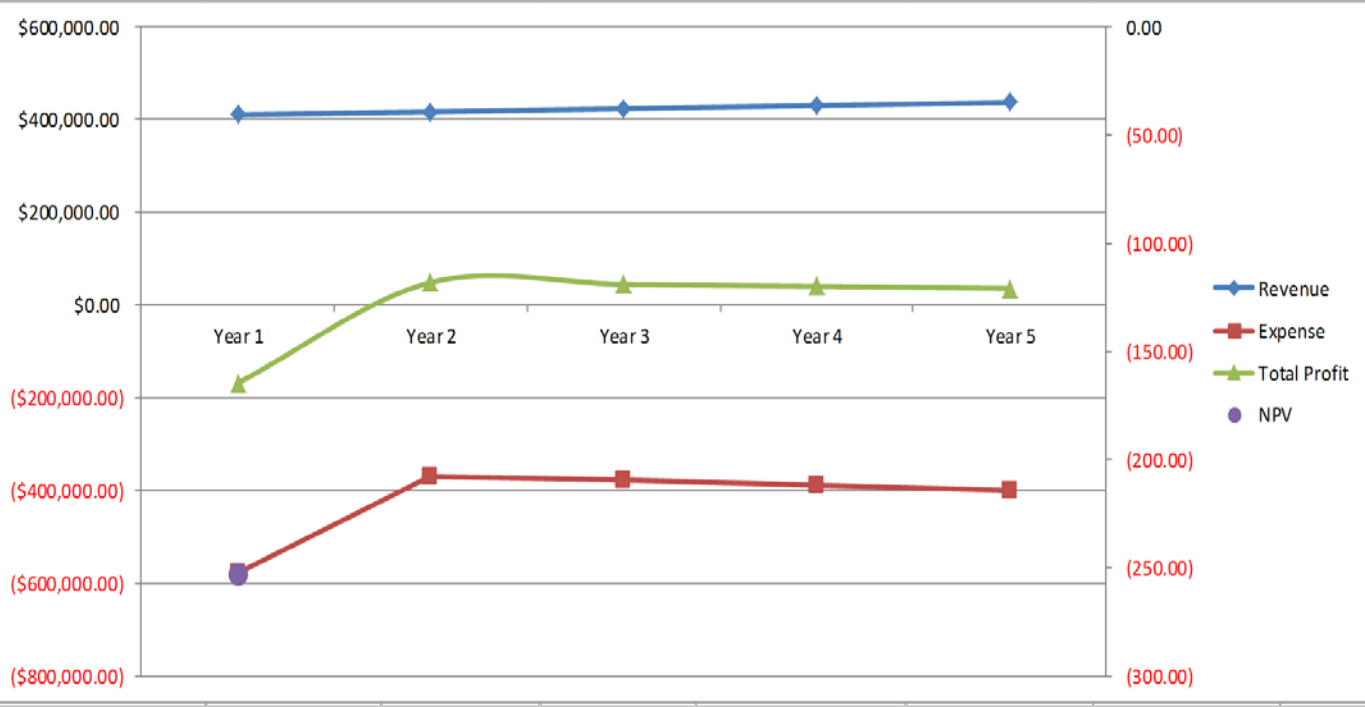
Courses of Action

COA 3: VIPER Breakeven



	Year 1	Year 2	Year 3	Year 4	Year 5
Revenue	\$410,555.19	\$417,021.43	\$423,589.52	\$430,261.06	\$437,037.67
Expense	(\$579,100.62)	(\$368,362.96)	(\$378,920.30)	(\$389,780.55)	(\$400,952.39)
Total Profit	(\$168,545.43)	\$48,658.48	\$44,669.22	\$40,480.51	\$36,085.28
NPV			(253.55)		

Average Census of BMTs	35,000
Percent who go to MedHold	0.91%
Number of BMTs to MedHold	318.0
Percentage in MedHold for MSK	66%
Total Trainees in MedHold for MSK Injury	209.0
Effectiveness of VIPER in preventing admission to MedHold	-1%
Projected number of Trainees in MedHold for MSK	212.8
Average Length of Stay in MedHold	32.0
Effectiveness of VIPER in Reducing Days in MedHold	-2%
Projected Number of Days in MedHold	32.6



Break Even:

With VIPER

- 1% admission rate reduction
- 2% reduction in the number of days a trainee is kept in MedHold to heal



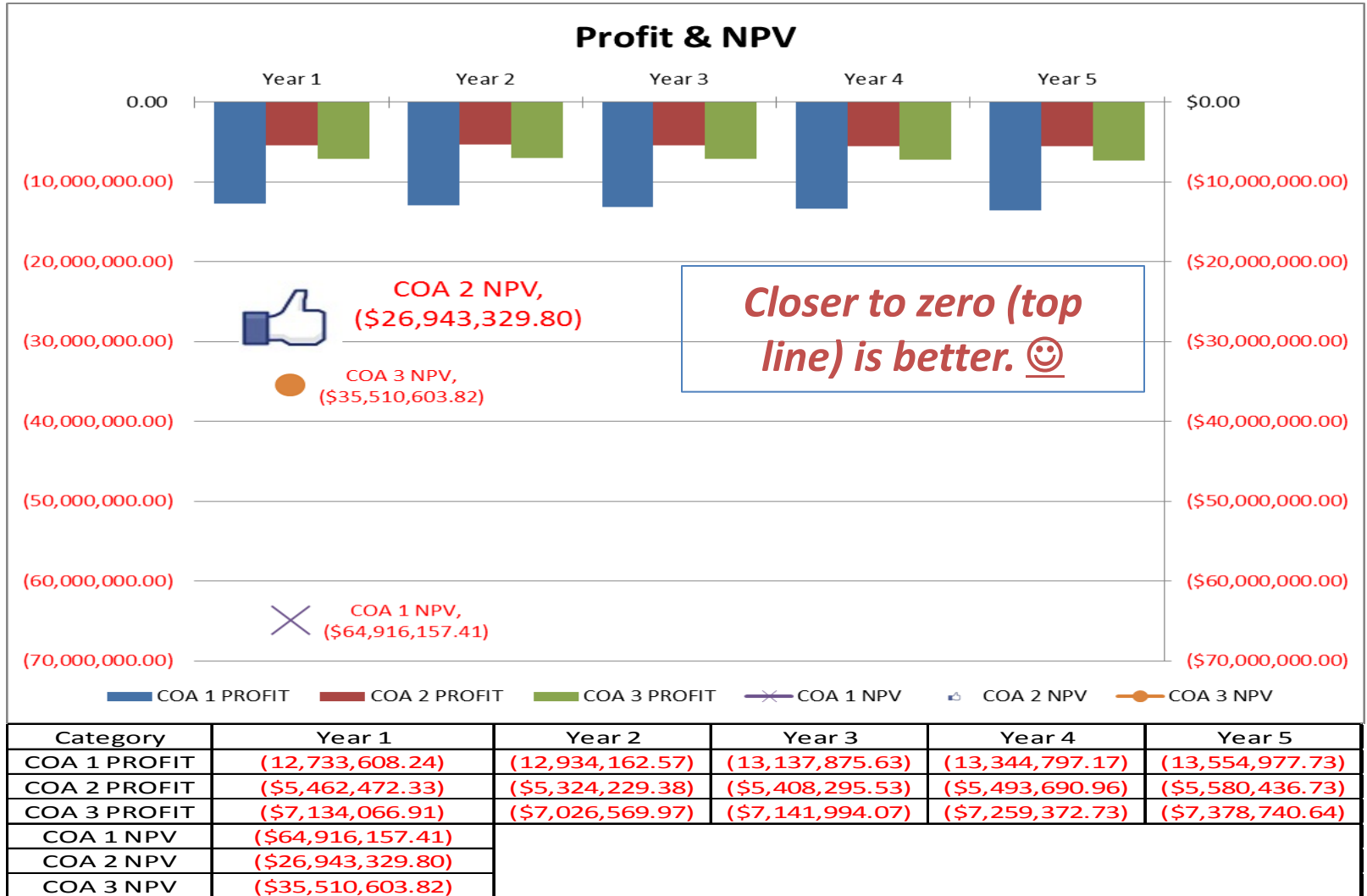
Assumptions



- COA 2 (Optimize PT) – “Aggressive” physical therapy visit numbers are adequate and equate to a 38% reduction in recovery days.
- COA 3 (VIPER) – MedHold prevention rate of 22% & a 38% reduction in recovery days.
- Accuracy of RAND study BMT cost per day estimates



COA Summary



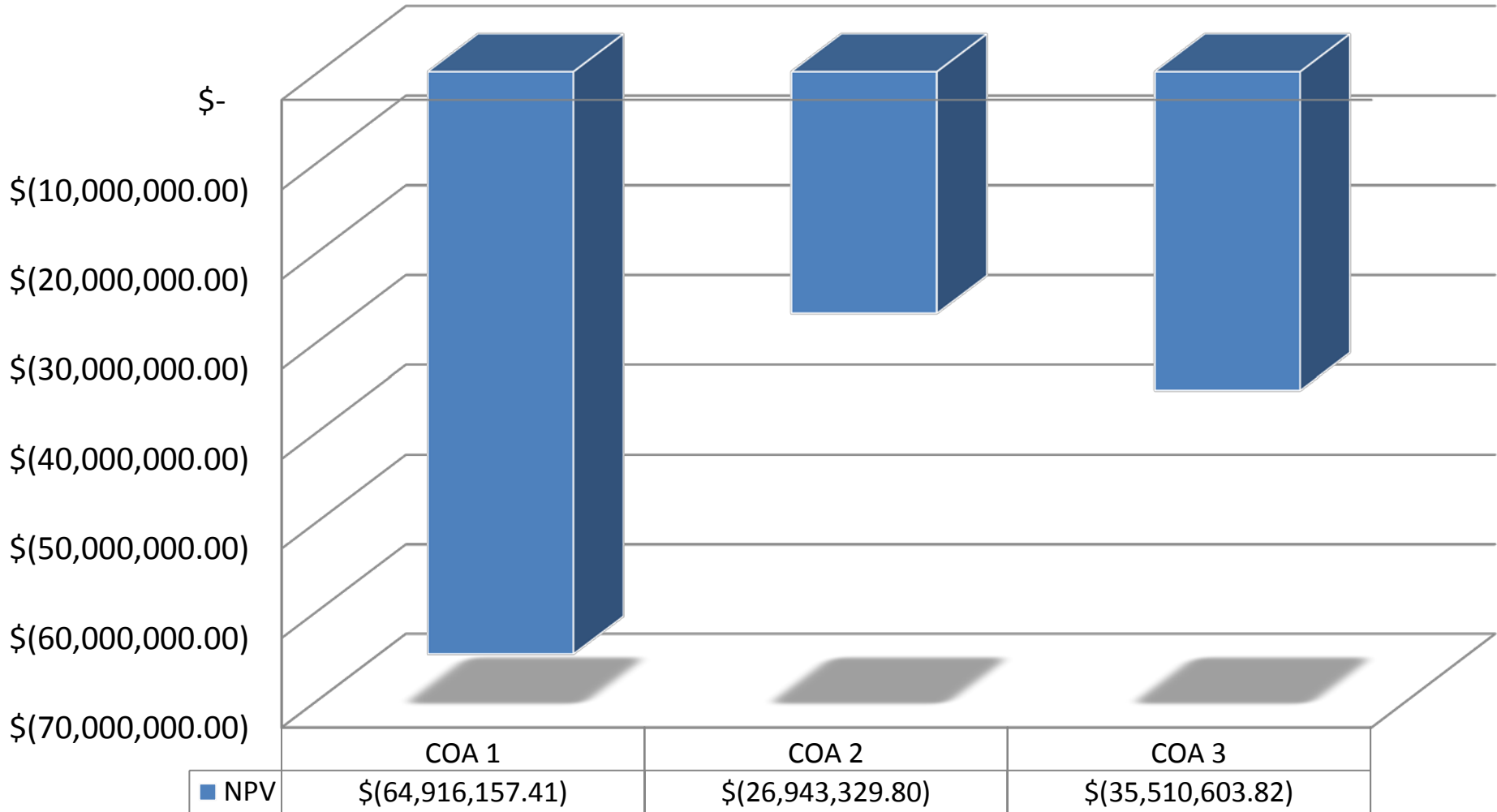
Closer to zero (top line) is better. 😊



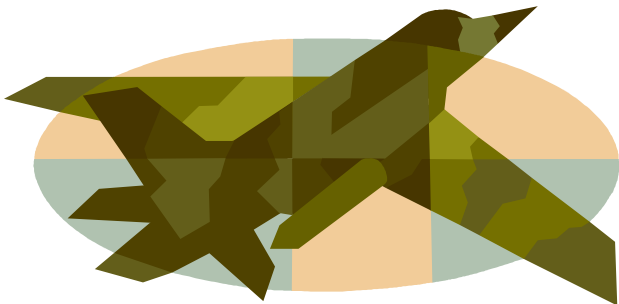
COA Summary

Comparison of Course of Action

Net Present Values



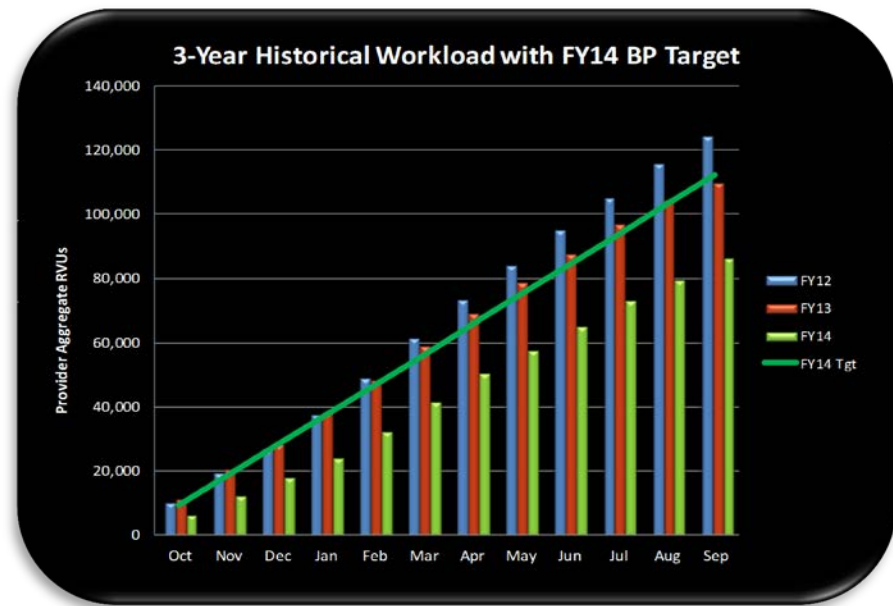
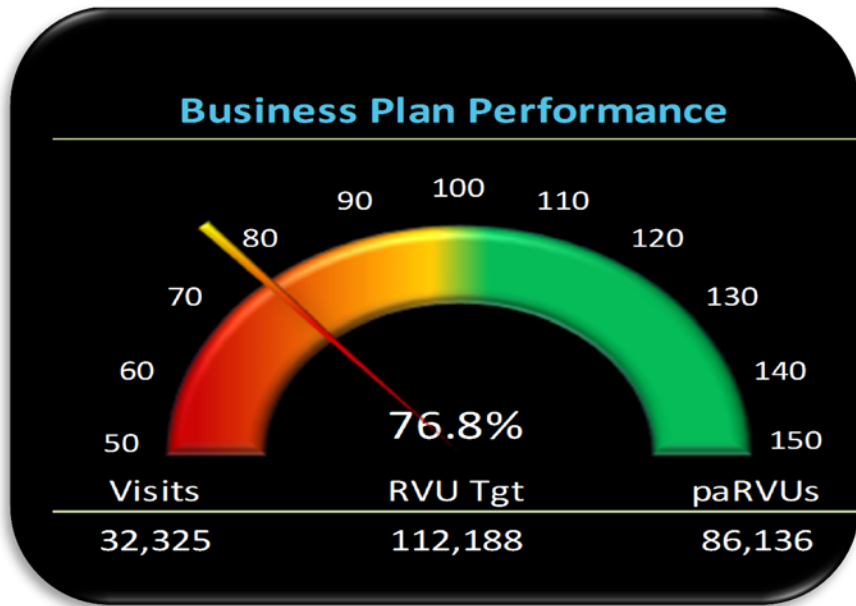
RECOMMENDATION





Recommendation Support

Current PT Performance



- Lackland PT has not been meeting expected performance targets.
- It appears projected capacity exists
- PT workload has been decreasing year –over- year



Recommendation



COA 2: Optimize physical therapy is the most cost effective option (best NPV).

- Focus on injury prevention
 - Leverage Capt. Nye's Walk to Run program
- BMT / MedHold care main focus for existing PT
- Program additional demand into business plan
- Reduce cost per visit by 10.14% on BMT patients to (to \$98.29) achieve breakeven in DHP PT ROI (not including new equipment maintenance costs)
 - Data system MEPRS file and table alignment (AHLTA,EAS, DMHRSi, GFEBS, DCPDS, DCPS, DMLSS)
 - DMHRSi accuracy
- Request additional funding to cover unavoidable losses if operational efficiency cannot be achieved



Questions?