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# **Handling the Wounded in a Counter-Guerrilla War: the Soviet/Russian Experience in Afghanistan and Chechnya**

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## ***Introduction***

The Soviet Union intervened in the Afghanistan Civil War on Christmas Day 1979 to restore a weak and faltering communist government that was rapidly slipping out of control. The Soviets expected little resistance and apparently had no plan for staying longer than three years. They were there for nine years, one month and eighteen days. Soviet Army medical personnel were also there for the duration fighting disease and wounds. While they were there, they improved casualty-handling and surgical support. Consequently, during the latter part of the war, they saved many lives that would have been lost earlier. They applied many of these lessons to the war in the break-away Republic of Chechnya. Many of their lessons learned can be applied to other modern forces fighting on rugged and urban terrain.

## ***Soviet Wounded***

Of the 620,000 Soviet personnel who served in Afghanistan, 14,453 were killed or died from wounds, accidents or disease. This is 2.33% of those who served. A further 53,753 (or 8.67%) were wounded or injured.<sup>(1)</sup> In the early part of the war, there were twice as many Soviet soldiers wounded by bullets as shrapnel, but by the end of the war, there were 2.5 times more Soviet soldiers wounded by shrapnel than by bullets. The proportion of multiple and combination wounds increased four times over the course of the war while the number of serious and critical wounds increased two times. Land mines were the primary reason for this increase in serious and critical wounds. The number of wounded from land mines increased by 25-30% over the course of the war.<sup>(2)</sup> Chart 1 reflects this change.

Type of Wounds	1980	1981	1982	1983	1984	1985	1986	1987	1988
% Bullet	62.2	54.7	50.4	46.0	34.1	36.6	31.8	26.5	28.1
% Shrapnel	37.2	45.3	49.6	54.0	65.9	63.4	68.2	73.5	71.9
% Multiple & combination	16.0	21.1	29.5	47.6	65.4	72.8	68.8	65.8	59.4
% Serious & critical	23.1	27.7	31.1	47.1	52.4	51.4	50.2	50.1	45.2

**Chart 1: Type and severity of wounds as a percentage of total hostile fire and mine wounds<sup>(3)</sup>**

During the early years of the war, the *mujahideen* guerrillas had rifles but few mortars and land mines. As the war progressed, the guerrillas captured or received these weapons and consequently the type and nature of wounds changed. Improved Soviet medical evacuation during the war allowed more critically wounded to survive. This is reflected in Chart 2 which shows the number of war dead and wounded for the Soviet 40th Army by year.

Year	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Dead	86	1484	1298	1948	1446	2343	1868	1333	1215	759	53
Wound		3813	3898	6024	4219	7786	8356	7823	5008	3663	144

**Chart 2: Soviet 40th Army War Dead and wounded<sup>(4)</sup>**

As the chart indicates, the ratio of dead to wounded improved over time from roughly 1:3 to 1:5 with a 1: 3.6 ratio overall. The Russians state that the U.S. ratio of dead to wounded during the Vietnam war was 1:5.<sup>(5)</sup> Despite the increased severity of wounds, more wounded survived. Changes in Soviet Army medical procedures apparently improved survivability.

The location of wounds were also a function of the improvement in guerrilla armaments. Chart 3 shows the location of the wounds and their percentage for the first and last full years of the war. The chart is incomplete and the source provided general figures of upper extremities 25.4%, lower extremities 37.9% and thoracic and abdominal wounds 1.7% without reference to any change over time. Still, the chart shows an increase in injuries consistent with shrapnel from mines over time and a decrease in wounds to the chest, stomach and pelvis. The decrease is probably due to enforced wearing of flak jackets plus the partial issue of improved flak jackets.

Location of Wound	1980	1988
Cranium and brain	4.9%	8.5%
Backbone and spinal cord	0.1%	0.9%
Face and jaw	1.4%	1.9%
Eyes	1.3%	3.2%
Otolaryngologic	1.8%	3.4%
Chest	11.6%	6.3%
Stomach and pelvis	7.8%	4.6%

**Chart 3: Location of wounds by percentage over time<sup>(6)</sup>**

Chart 4 shows the percentage of wounds by location for the Great Patriotic War (Soviet Union versus Germany during World War II-Soviet wounded), Vietnam (U.S. wounded), Afghanistan (Soviet wounded) and the fighting in Chechnya (Russian wounded). Differences in the percentage of wounds by location is a reflection of the type terrain that each war was fought on, the training and skill of the combatants, and the type and degree of individual protection available.

Wound site	Great Patriotic War	Vietnam	Afghanistan	Chechnya-1995
Head and Neck	19.0	21.0	15.7	24.4
Chest	9.0	5.0	12.2	8.6
Stomach	5.0	18.0	7.1	2.3
Pelvis	-	-	3.8	1.6
Arms	30.0	20.0	26.3	27.3
Legs	37.0	36.0	34.9	35.8

**Chart 4: Percentage of wounds by location in various wars**<sup>(7)</sup>

Practicing medicine in Afghanistan's rugged mountains and extreme climate provided some real challenges to Soviet medical personnel. The dry climate, high summer temperature, and impure water added to the difficulties. Serious disease hospitalized 67.09% of all Soviet soldiers in Afghanistan.<sup>(8)</sup> Soldiers died of sunstroke. Helicopters could not always reach the altitude where the troops were fighting. Soldiers who were lightly wounded high in the mountains had to be evacuated or their wounds would turn serious. Soldiers who were seriously wounded while high in the mountains usually died. Since the helicopters could not reach the soldiers, wounded had to be carried down to an altitude and place where the helicopters could land. The carrying party required security, so 13 to 15 men could be tied up in evacuating one wounded soldier.<sup>(9)</sup> Often, doctors accompanied ambush parties and patrols into the mountains.<sup>(10)</sup>

### ***Medical Support***

Soviet TO&E medical personnel were assigned at maneuver company level and higher. There was a medic and assistant medic at company. A physicians assistant or newly commissioned doctor commanded the maneuver battalion medical section which handled initial treatment and evacuation. The regimental medical post had a medical platoon consisting of two or three doctors, a dentist, two physicians assistants, a technician, a pharmacist, nurses, a cook, a radio operator, orderlies and drivers. The regimental medical post served as a dressing station and provided immediate surgery, transfusions, treatment for lightly wounded and evacuation to the division medical battalion.<sup>(11)</sup>

The basic medical service unit is the division's medical battalion. This battalion could run a field hospital which could handle up to 400 patients every 24 hours, conduct surgery and run a 60 bed recovery facility. The battalion has three or more surgeons, a therapist, a doctor of internal medicine, an epidemiologist, and a toxicologist. The Soviet medical system was designed to treat the sick and wounded at the lowest possible level and ground-evacuate the serious cases through the various echelons to where they could be effectively treated.<sup>(12)</sup>

The Soviets deployed three motorized rifle divisions ( 5th, 108th, 201st) and an airborne division (103rd) to Afghanistan. Each of these divisions had a medical battalion. The Soviets also deployed two separate motorized rifle brigades (66th and 70th), a separate air assault brigade (56th), two separate motorized rifle regiments (191st and 860th), and a separate airborne regiment (345th) each with a medical company.<sup>(13)</sup> In addition, the Soviets deployed eight hospitals into Afghanistan and two on the Soviet-Afghan border. The 650th central military

hospital (500 bed) and an infectious disease hospital (500 bed) were in Kabul. Another 500-bed infectious disease hospital was in Bagram and a 150-bed infectious disease hospital was located in Kunduz. A 200-bed infectious disease hospital for the highly contagious was located to the east in Jalalabad. A 200-bed field hospital was located in Puli-Khumri and a 175-bed field hospital was located south in Kandahar. A 300-bed hospital at Shindand served the western corridor.<sup>(14)</sup>

These extra hospitals were needed. The Soviets discovered that the number of wounded requiring intensive care was significantly higher than expected due to the increasing number of wounded who survived due to rapid evacuation to supporting hospitals. Chart 5 shows the percentage of wounded requiring intensive care by type of wound. It shows that although the number of shrapnel wounds increased during the war, a significant percentage of gunshot wounds required intensive care.

<b>Injury</b>	<b>1980</b>	<b>1981</b>	<b>1982</b>	<b>1983</b>	<b>1984</b>	<b>1985</b>	<b>1986</b>	<b>1987</b>	<b>1988</b>	<b>Total</b>
Gunshot wound	29.2	26.2	33.9	39.9	39.9	38.9	43.9	29.1	51.5	36.3
Other trauma	43.2	38.6	26.3	21.4	21.4	14.3	18.0	13.0	14.0	17.9
Burns	41.3	30.8	66.6	37.4	37.4	32.2	40.4	66.6	52.5	42.6
Total wounded	33.1	29.4	34.7	36.7	36.7	31.9	36.9	24.2	38.7	32.3

**Chart 5: Percentage of wounded treated in 40th Army facilities requiring intensive care by category of injury<sup>(15)</sup>**

A significant proportion of the wounded required emergency procedures and trauma care. Chart 6 shows admission data on the percentage of those wounded admitted to emergency care or trauma units with complications requiring anesthesiology or resuscitation.

<b>Complications</b>	<b>Medical company or medical battalion</b>	<b>Garrison military hospital</b>	<b>Central military hospital</b>
Shock	46.7	40.3	13.6
Loss of blood	18.1	16.9	8.3
Damage to central nervous system	10.1	8.5	6.9
Suppurative wound	4.6	6.2	19.6
Anaerobic infection	0.6	0.8	1.1
Fat embolism	1.4	1.2	0.7
Asphyxiation	1.7	1.5	0.8
Multiple system failure	---	3.2	7.5
Post operative complications	16.8	21.4	41.5

**Chart 6: Percentage of wounded with complications upon admission to emergency or trauma care by type of complication and site of treatment<sup>(16)</sup>**

## ***Medical Evacuation***

Afghanistan was not a conventional war and Soviet medical evacuation procedures changed to meet the demands of the counter-guerrilla environment. Ground evacuation was used, but helicopter evacuation was used more often. The regimental medical post was frequently bypassed as wounded were evacuated directly from the battalion aid station to the division field hospital or one of the army hospitals. Over the course of the war, the number of wounded treated at regimental or brigade medical posts decreased from 18% of the total to 2.5%.<sup>(17)</sup> Instead, during major Soviet offensives, 90% of Soviet wounded were immediately evacuated by helicopter (74% in 1981 up to 94.4% in 1987). In 1980, 48% of the wounded were evacuated to the division field hospital or an army hospital within three hours of being wounded. By 1987, this had improved to 53.1%. In 1980, an additional 33% of the wounded arrived at the division field hospital or an army hospital within 3 to 12 hours of being wounded. By 1987, this had improved to 41.9%. In 1980, 19% of the wounded took over 12 hours to arrive at the division field hospital or an army hospital. By 1987, this was down to 5%.<sup>(18)</sup>

Prior to Afghanistan, the Soviet Army planned to evacuate the bulk of its sick and wounded by ground transportation. However, ground evacuation was difficult due to Afghanistan's mountainous terrain, lack of a developed road network, the likelihood of ambush along the few roads and the long distances between regimental staging areas and medical facilities. The Soviet Army used aerial evacuation to move 68% of the wounded between 1980-1988 (Figure 1). Over 25,000 casualties were evacuated by helicopter during combat and over 152,000 sick and wounded were moved by air during some stage of medical treatment.<sup>(19)</sup> The Mi-8MB<sup>(20)</sup> "Bisector" medical evacuation helicopter was outfitted specifically for medical evacuation, but due to their limited availability, combat and transport helicopters also frequently flew wounded to hospitals. The fixed-wing, propeller-driven, light medical transport AN-26M<sup>(21)</sup> "Savior" moved sick and wounded within Afghanistan and into the Soviet Union. The fixed-wing, propeller-driven medium medical transport IL-18<sup>(22)</sup> "Orderly" moved sick and wounded from Afghanistan to the Soviet Union (Figure 1)<sup>(23)</sup>. Patients were moved within the Soviet Union on the heavy jet military transport IL-76MD<sup>(24)</sup> "Scalpel" or the wide-bodied TU-154 passenger jet. These aircraft could be rigged to carry stretchers and provide in-flight emergency medical care.

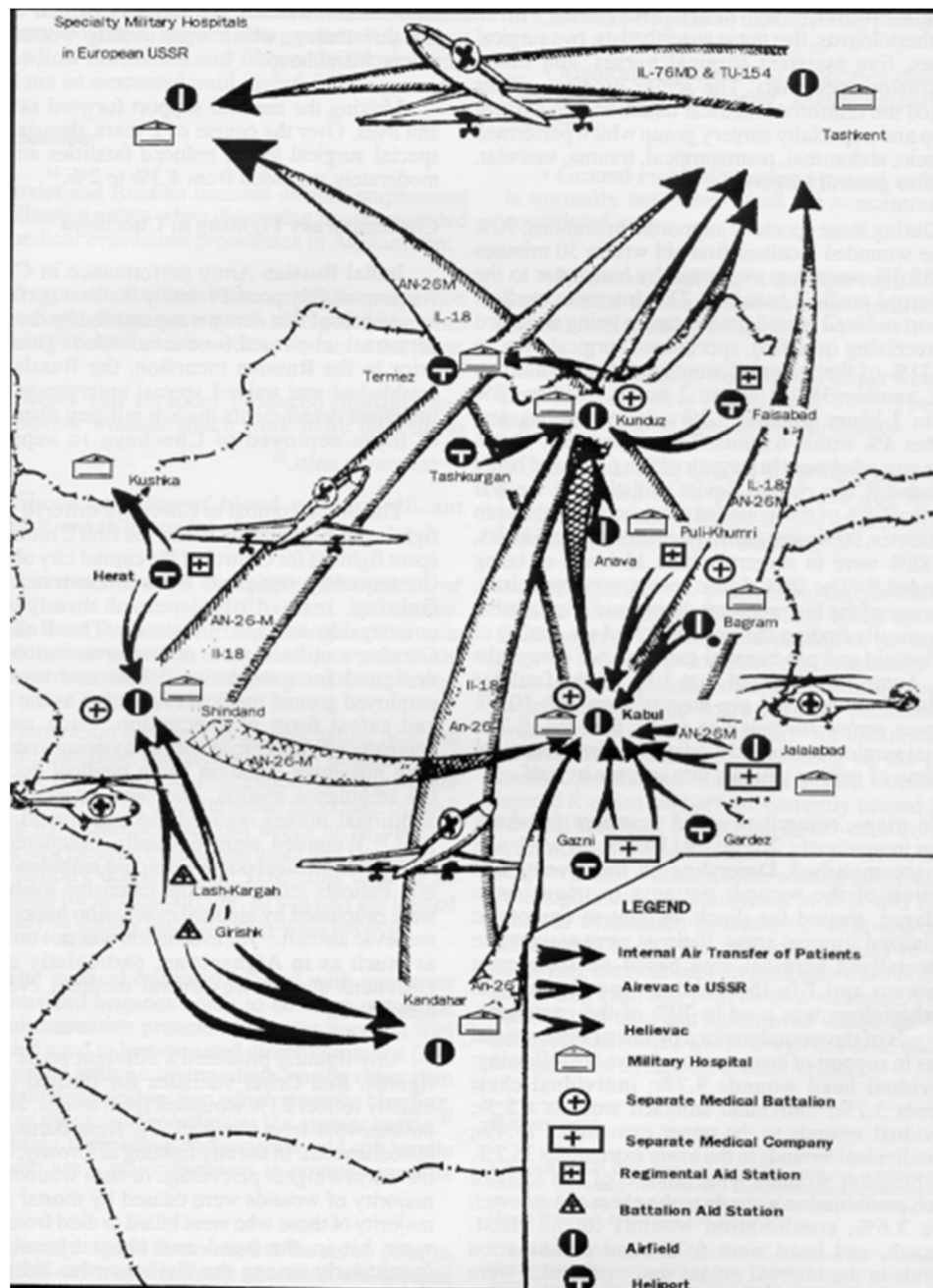


Figure 1: Soviet air evacuation of sick and wounded during the Afghanistan War. <sup>(25)</sup>

During the first half of the war, patients were evacuated by air from several hospitals in Afghanistan to the Soviet Union, but during the second half of the war, almost all patients were evacuated from the 650th Central Hospital in Kabul. During 1980-1988, Soviet aircraft transferred approximately 40,000 patients (42.1% wounded and 57.9% sick) between the various hospitals in Afghanistan. Another 78,000 patients (26% wounded) were flown to the 340th Regional Military Hospital in Tashkent, Turkestan Military District of the Soviet Union for treatment. Over 40% of the Soviet wounded were treated and recovered in the Soviet Union. Some of the wounded required specialized surgery or prosthetics. These patients were handled in specialty military hospitals in the western (European) Soviet Union. Up until 1987, these patients



staged through the Tashkent hospital. From 1987, they were flown directly to these specialty hospitals from Kabul. Over 9,000 of these special-treatment cases were handled, 90% of whom required special surgery. <sup>(26)</sup>

Seriously wounded patients were evacuated from Kabul to the Soviet Union for treatment based on the severity and type of wound. Kabul hospital held 96.8% of patients with eye wounds, 78.6% of patients with neck and spinal wounds and 74.9% of patients with brain and cranial wounds for three days before air evacuation. 22% of patients with stomach wounds and 14.3% of patients with pelvic wounds were evacuated to the Soviet Union on the same day that they were wounded, while the remainder waited five to seven days. One third of the patients with thoracic-abdominal wounds were evacuated within 24 hours of being wounded, while the rest waited for up to ten days. 46% of the patients with a puncture wound to the chest were evacuated within three days. During these evacuation flights to the Soviet Union, 25% of the patients required intensive care while another 20% required symptomatic care. In 1987, when the IL-76 flight originated from Kabul instead of Tashkent, 9% of the severely wounded reached specialty hospitals within five days of being wounded and 32% reached these hospitals within ten days. Prior to this, only 1% reached these hospitals within five days and 5.4% within ten days. <sup>(27)</sup>

The Soviets experienced some problems with air evacuation. There wasn't enough room in the Mi-8MB medical evacuation helicopter and they carried outmoded Soviet medical supplies, rather than the better supplies from the west. There were not enough medical evacuation helicopters in theater, and so many wounded were evacuated on the first available cargo or attack helicopter without being stabilized prior to flight. Medical aircrew were not readily available and had to be trained. Airfields didn't have the right type of retractable ladders to allow the easy loading and unloading of litters. <sup>(28)</sup>

The value of aerial evacuation is shown by a Soviet study of 318 fatalities examined by the pathologists in the morgue of the Turkmenistan Military District Hospital in Tashkent during 1986-1988. Their statistics show that 37.4% of the dead were evacuated by transport, attack or medical helicopter, 35.6% by a BMP, BTR or BRDM armored personnel carrier, 11.6% by field ambulance, 8.2% by cargo truck and 2.8% by fixed wing aircraft. <sup>(29)</sup> A much higher percentage of these dead were evacuated by ground than was usual. Perhaps more of these wounded would have survived if they had been evacuated by medical helicopter.

### ***Special Surgical Teams***

The Soviets formed special surgical teams to support projected military operations. The personnel on these teams came from the central military hospital and from medical units not already supporting the upcoming operation. The chief medical officer of the 40th Army usually headed these teams which were integrated into medical battalions close to the combat zone. These teams normally consisted of three thoracic-abdominal surgeons, a neurosurgeon, a traumatologist, a heart surgeon, three anesthesiologists, five nurse anaesthetists, two surgical nurses, five assistant surgical nurses and blood transfusion specialists. The senior medical officer formed the reinforced medical battalion into a triage group and a specialty surgery group which performed thoracic, abdominal, neurosurgical, trauma, vascular and also general surgery. <sup>(30)</sup>

During these specially supported operations, 90% of the wounded received first aid within 30 minutes and then 88.3% were evacuated by helicopter to the reinforced medical battalion. This intensive medical support reduced lapsed time between being wounded and receiving qualified, specialized surgical care so that 31% of the wounded were in surgery within an hour, another 38.7% within two hours, another 13% within three hours, another 5.7% within four hours, and another 4% within six hours. Thus, 92.4% of the wounded were in surgery within six hours of being wounded.<sup>(31)</sup> The overall Soviet statistics for the war state that 98% of the wounded received first aid within thirty minutes and that 90% were seen by a doctor within six hours and 88% were in surgery within twelve hours of being wounded.<sup>(32)</sup> (The 98% figure seems very optimistic, since one of the big problems during and after combat is physically finding the wounded. And the quality of the first aid and pre-hospital care was not always the best. Autopsies disclosed that 10% of the fatalities resulted from errors in pre-hospital care with 10.6% of these errors attributed to faulty first aid.)<sup>(33)</sup> The special surgical teams and medical reinforcements cut the time of getting patients into surgery by half.

In triage, resuscitation and treatment for shock began immediately. X-rays and laboratory work was also accomplished. Depending on the severity and location of the wound, patients in triage were bandaged, treated for shock or sent to one of the specialized surgical areas. Patients were assigned to a specialized surgical area based on their most dominant and life-threatening wound. General anesthesiology was used in 70% of the operations. Analysis of the wounds treated by one of these special teams in support of an operation shows the following: individual head wounds 9.7%; individual chest wounds 3.7%; individual stomach wounds 4.5 %; individual wounds to the upper extremities 19.4%; and individual wounds to the lower extremities 36.2%. Combination wounds were 26.5% of the total of which combination wounds to the chest and stomach were 3.6%; combination wounds to the chest, stomach and head were 6.7%; and combination wounds to the internal organs and extremities were 16.2% (these figures probably reflect the high number of wounded due to land mines). Priority for treating combination wounds was based on which was most life-threatening, which were usually wounds to the stomach and head.<sup>(34)</sup>

Moving the medical support forward saved time and lives. Over the course of two years, the use of these special surgical teams reduced fatalities among the moderately wounded from 4.3% to 2%.<sup>(35)</sup>

### ***Contemporary Fighting in Chechnya***

Initial Russian Army performance in Chechnya was remarkably poor. Probably the best performance by any part of that army was provided by the medical personnel who cared for the wounded. Three weeks prior to the Russian incursion, the Russian Army established and trained special emergency medical treatment detachments in each military district. Four of these deployed to Chechnya to support the maneuver units.<sup>(36)</sup>

The initial combat in Chechnya differed from the fighting in Afghanistan since the first two months were spent fighting for control of the capital city of Grozny. Consequently, regiments were concentrated for city fighting, instead of dispersed throughout the countryside as in Afghanistan. The Russians in Chechnya utilized their normal evacuation system designed for



conventional war and most often employed ground medical evacuation as the quickest and safest form of evacuation. Each maneuver company was reinforced with a physician's assistant and each maneuver battalion had a medical doctor plus the ambulance section. Surgeons, anesthetists and additional nurses manned the regimental medical post.<sup>(37)</sup> Wounded were normally evacuated to the regimental medical post by armored ambulance (BTR-80). Patients requiring more extensive medical care were evacuated by medevac helicopter and medevac aircraft.<sup>(38)</sup> Air evacuation was not used nearly as much as in Afghanistan, particularly after the Chechens shot down several medevac helicopters.

City fighting produced a different set of casualty figures. Red Cross statistics for limited conflicts usually reflect 23% wounded from mines, 26% from bullets, 46% from shrapnel, 2% from burns and 3% miscellaneous. In the city fighting of Grozny, however, there was a higher percentage of burn wounds and the majority of wounds were caused by mortar fire. The majority of those who were killed or died from wounds were hit in the head and chest by sniper fire (particularly among the civilians who did not have flak jackets and helmets). Whereas the normal ratio of wounded to killed is 3:1 or 4:1, this was reversed in the Grozny city fighting where three were killed for every wounded. Snipers also presented a problem for medical evacuation and frequently the wounded could not be evacuated until night fall.<sup>(39)</sup>

## ***Conclusions***

Soviet and Russian medical doctors emphasized the following points when discussing Soviet wounded and medical evacuation procedures in Afghanistan:

- As guerrillas became better armed, the proportion of gunshot to fragment wounds changed with mines becoming one of the more serious threats to the force.
- Mines and shrapnel produced multiple and combination wounds which were more difficult to treat.
- Shock and loss of blood were significant complications in treatment of wounded.
- Air evacuation is the preferred method of evacuation in counter-guerrilla wars. In counter-guerrilla wars, the distance to supporting medical units increases, the evacuation route is subject to ambush and the terrain usually slows down ground evacuation.
- Preparation for medical air evacuation needs to start in peacetime. More, better-designed and equipped Mi-8 medical evacuation helicopters are needed. The AN-72 twin-turboprop STOL (short take off and landing) light transport aircraft needs to be put into service as a medical evacuation asset and stationed in every military district.<sup>(40)</sup> TO&E slots need to be established for medical aircrew, so that they are trained and ready to deploy immediately when needed.<sup>(41)</sup>
- The medical company located with maneuver regiments and brigades needs to be taken out of the medical evacuation process in counter-guerrilla war. Wounded need to be evacuated directly from the field to a hospital with no intermediate station other than the battalion medical section which stops the bleeding, treats for shock and coordinates the air evacuation.<sup>(42)</sup> Presumably, the medical companies would still handle sick, who are a major problem in counter-guerrilla war.
- Special surgical teams need to be set up prior to the start of any major military operation and located as far forward as possible.

Preliminary Russian lessons from the city fighting in Chechnya emphasize the following points:

- Medical points need to be located close to the fighting to provide prompt, life-saving care to the wounded.
- Ground evacuation using armored ambulances is normally best when units are concentrated in a constricted area.
- Maneuver units need medical reinforcement, both within the units and a augmentation to the normal field medical units.
- Burns, shrapnel wounds and sniper wounds are far more common in city fighting. Snipers produce a high percentage of head and neck wounds.
- Medical units directly supporting units fighting in a city need to be protected and dug in. When possible, the entire hospital should be underground in basements connected by trenches.

From the authors' perspective, the Soviets needed to do a better job on first aid and initial emergency field surgery. The wounded needed to be stabilized prior to medical evacuation. Air evacuation should have been on specially-equipped medical evacuation helicopters with on-board medical personnel. The evacuation plan and preparation for commitment of medical teams will vary depending on the type of combat, terrain and climate. In Bosnia, wounded and injured Russian soldiers are currently treated in US medical facilities. In a future, larger-scale combined operation involving Russian and US forces, medical support issues will have to be worked out in advance. Although there are similarities in US and Russian medevac procedures, there are enough differences in the two medical systems to justify deploying medical support packages from both sides and letting each side treat its own wounded. This has been shown time and again, even within the United States Armed Forces when Army, Air Force and Navy wounded are treated by another branch.

## ENDNOTES:

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2. E. A. Nechaev, A. K. Tutokhel, A. I. Gritsanov, and I. D. Kosachev, "Meditsinskoe obespechenie 40-I armii: Tsifry i fakty" [Medical support of the 40th Army: Facts and Figures], Voenno-meditsinskiy zhurnal [Military medical journal, hereafter *VMZ*], August 1991, 4.

3. Ibid, 6.

4. Aleksandr Lyakhovskiy, Tragediya i doblest' Afgana [The tragedy and valor of the Afghanistan veterans], Moscow: Iskona, 1995, appendix 14. The figures in this chart add up to 13,833 war dead instead of the 14,453 dead mentioned earlier in the article. This is because the chart represents the war dead of the 40th Army--the principle Soviet military force in Afghanistan. The KGB lost 572 dead, the Ministry of Internal Affairs lost 28 dead and other ministries and departments lost 20 dead during the war. Krivosheev, 402. The lower losses in 1979 and 1989 reflect that the Soviet invasion of Afghanistan began on 25 December 1979 and

that the Soviet forces had withdrawn by 15 February 1989. The original chart gives no wounded figures for the one week of Soviet involvement in 1979. The figure for 40th Army wounded totals 50,734. Wounded includes combat and non-combat wounds, crippling and trauma.

5. P. G. Brusov and V. I. Khrupkin, "Sovremennaya ognestrel'naya travma" [Modern bullet and shrapnel-induced trauma], *VMZ*, February 1996, 26. Russian source of U.S. statistics is unknown.

6. E. A. Nechaev, A. K. Tutokhel, A. I. Gritsanov, and I. D. Kosachev, 4.

7. P. G. Brusov and V. I. Khrupkin, 26. No citation for the source of Vietnam wounds is given.

8. L.W. Grau and W. A. Jorgensen, "Medical Support in a Counter-guerrilla War: Epidemiological Lessons Learned in the Soviet-Afghan War" Army Medical Department Journal, May-June, 1998, 41-49.

9. Boris Gromov, Ogranichenny kontingent [Limited contingent], Moscow: Progress, 1994, 185-186.

10. Lester W. Grau, The Bear Went Over the Mountain: Soviet Combat Tactics in Afghanistan, Washington: NDU Press, 1996, 194. The U.S. Army sends medics to accompany patrols and ambush parties, but not doctors. The Soviet practice probably reflects the lower state of training of Soviet medics and the need to provide immediate care when high-altitude medical evacuation was not possible.

11. Soviet Studies Research Centre, The Sustainability of the Soviet Army in Battle, The Hague: SHAPE Technical Centre, September 1986, 286-296.

12. Department of the Army, FM100-2-2 The Soviet Army Specialized Warfare and Rear Area Support, Washington: USGPO, 1984, 13-20 to 13-21.

13. Soviet operational maps in Mr. Grau's collection.

14. V. D. Kuvshinskiy, "Tekhnicheskoe obsluzhivanie i remont meditsinskoy tekhniki v khode voennykh deistviy" [Technical service and repair of medical equipment in the course of military activity], *VMZ*, 4-5 1992, 44.

15. A. I. Levshankov, B. S. Udarov, Yu. S. Polushin and B. N. Bogomolov, "Okazanie reanimatologicheskoy pomoshchi ranenym v Afghanistane" [Reanimation care of the wounded in Afghanistan], *VMZ*, April-May 1992, 23.

16. Ibid, 24

17. I. M Chizh and N. I. Makarov, "Opyt meditsinskogo obespecheniya lokal'nykh voyn i problem evakuatsii ranenyykh i bol'nykh po vozdykhu" [The experience of medical support to local wars and the problems of air evacuation of the sick and wounded], *VMZ*, January 1993, 23.

18. E. A. Nechaev, A. K. Tutokhel, A. I. Gritsanov, and I. D. Kosachev, 4.
19. N. M. Chizh and N. I. Makarov, 22.
20. NATO designation of the Mi-8 helicopter is HIP.
21. NATO designation of the AN-26 is CURL.
22. NATO designation of the IL-18 is COOT.
23. Figure 1 is from E. A. Nechaev, A. K. Tutokhel, A. I. Gritsanov, and I. D. Kosachev, 5.
24. NATO designation of the IL-76 is CANDID.
25. "Meditinskoe obespechenie 40-i armii (Tsifry i fakty)" [Medical Support of the 40th Army (Facts and Figures)], *VMZ*, August 1991, 5.
26. N. M. Chizh and N. I. Makarov, 23.
27. Ibid.
28. Ibid.
29. M. A. Velichko, "Nedostatki v okazanii meditsinskoy pomoshchi ranenym v dogospital'nom periode: patologoanatomicheskie aspekty" [Limitations in medical care to the wounded in the prehospitization phase: pathologicoanatomic aspects], *VMZ*, April-May 1992, 42. The remaining 4.4% are unaccounted for.
30. Yu. V. Nemytin, "O spetsializirovannoy meditsinskoy pomoshchi ranenym v usloviyakh Afganistana" [Special medical aid to the wounded in Afghanistan], *VMZ*, January 1991, 17.
31. Ibid.
32. E. A. Nechaev, A. K. Tutokhel, A. I. Gritsanov, and I. D. Kosachev,, 4.
33. M. A. Velichko, 40-41. These figures may reflect first aid given by buddies and squad mates. Perhaps they also reflect the state of basic first-aid training in the Soviet Army at that time.
34. Ibid.
35. Ibid. 18.
36. N. N. Novichkov, V. Ya. Snegovskiy, A. G. Sokolov and V. Yu. Shvarev, Rossiyskie vooruzhennye sily b chechenskoim konflikte: analiz, itogi, vyvody [Russian armed forces in the Chechen conflict: analysis, results and outcomes], Moscow: Holweg-Infoglobe-Trivola, 1995, 131.

37. Ibid, 132.

38. Ibid, 134.

39. Ibid, 133.

40. NATO designation of the AN-72 is COALER.

41. N. M. Chizh and N. I. Makarov, 24.

42. Ibid.