MD-30 Thesis

Combat Triage

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The Differing Triage Protocols depending on Combat Situation

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The silence of the patrol is suddenly pierced by incoming mortar rounds….. “WHEEEEEEEEEEEEE, KATHUMP KATHUMP KATHUMP.” Dirt flies into the air, and other ‘things’, a phaser rifle, shreds of power armor, … blood. Red, Green, Ocher, all shades of that vital fluid necessary for humanoid life. And then one more sound, a call that has echoed on the battlefields for millennium…. “MEDIC!!!, Marine Down!!!”

The combat medic rushes forward, his medical bag on his hip, he reaches the crater, and their lies the four marines of the lead patrolling fire team, all are down, all are injured, all are like the medic, under fire. The medic has to decide whom first, who gets those first few precious seconds of treatment, he can’t be everywhere at once, and only he can decide.

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The aid station has been treating patients on a steady but manageable level for hours, then the call comes in, casualties in bound from the front line, you clear the four aid tables, and prepare the medicines and the staff. Then Sgt Jones pokes his head, a normally calm and collected marine with 15 years of combat experience, you notice his face his very pale, even for a human. “Sir, we have over a hundred casualties coming in, RIGHT NOW”

You grab your tricorder, you know the medics on the front line, you gave refresher training to many of them onboard the *USS LeJeune* as it was enroute to the planet, you know they know their job, and the first two litters you face, you see two of those medics, with bloody mangled chest wounds, and you have to choose, who goes first.

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The MSH has been quiet for a week, but you've been alerted that patients are inbound from the Aid Station, Sergeant C'Salek, an outstanding Vulcan I-Medic, is sending some critically wounded but stabilized marines. Seven are in need of thoracic surgery for critical and traumatic injuries to their cardiac system. Evac to an orbital star ship would be nice, if one was still around. Because of the nature of their injuries stasis is the least desirable option. You are the only thoracic surgeon available, the chief surgeon defers to your judgment, who goes first, who waits, who may not make it long enough to hit the operating table?

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It's called 'Triage', the process for sorting injured people into groups based on their need for or likely benefit from immediate medical treatment. Triage is used in hospital emergency rooms, on battlefields, and at disaster sites when limited medical resources must be allocated. In this paper, we will analyze in a more detailed manner, the process of Triage on the Battlefield, at the Aid Station, the MSH, and finally the Hospital (Ground or Ship Based). Each of these have a different set of Triage rules, and each will need to be more fully examined for the sake of those Marines who face the enemy on our behalf.

As the papers written before this one have built the groundwork for this paper, let us examine their connection. The AR-30 paper "Whither Armor" analyzed the continuing role of Armor in today's SFMC. In that paper a proposal to make even the SFMC Company/Battalion/Regiment more mobile and hard hitting by integrating them as Marine-Mobile Armored Cavalry units called Troops/Squadrons and Armored Cavalry Regiments. In each of these units is an organic medical element. From an ambulance and a couple of medics at the troop level, to a full-fledged reinforced Aid Station at the Regimental Level. Each of these medical elements no matter how

large or small will require its own Triage protocol, depending on the resources available and the combat situation the units are currently in.

The next paper the SU-30 paper “Care and Feeding of the Armored Cavalry Regiment” focused on the quantity of marine, materials and equipment transported by the detailed resources and vessels. However again at each level, allowances had to be made for transport of, and re-supply of the medical personally, equipment and vehicles. While the regiment may only move as far forward as its supply line, it marines will only move along that line if they are healthy, and recovering from the ravages of combat.

Finally the latest paper for CE-30, “Fort Lakota” detailed the fact that at each stage of constructing the Fort, from setting up the first defensive line around the landing zone, to the establishment of a firebase, to finally the construction of the full fortifications of the Fort, medical facilities were needed. These again represent the Field Medic (in the field), Aid Station (Fire Base), MSH (Fire Base / Independent Facility/or newly erected Fort), and a Fort Hospital (Full Fort), sometimes when possible the Fort Hospital becomes a permanent facility and is a Base Hospital; this is possible when the Fort itself become a permanent/semi-permanent facility. This is usually more the role of Starfleet and its Starbases.

The paper will be laid out in four parts. Part One will cover Triage in the field, Part Two will cover Triage at the Aid Station, Part Three will cover Triage at the MSH, and finally Part Four will cover Triage at the Fort Hospital or Hospital Ship. Each of these parts will be broken down the same with each covering the role that Diagnosis, Resources and the Tactical Situation affects the triaging of the casualties as they arrive at the base. Finally the

paper will be recapped and conclusions will be reached in regards to how triage applies to the Starfleet Marine Corps in its parts and its whole.

PART ONE: TRIAGE IN THE FIELD

The most obvious factor about this form of triage is that the bad guys are shooting at the medic. He or she has only those medical supplies they can carry. They have to make a decision now, and keeping themselves alive is one of those decisions. Then the medic has to make the difficult decision of who is first, who second and so one. This decision must be made with three major factors taken into consideration: Diagnosis, Resources, and Situation.

The medic has to classify the diagnosis of each patient into one of four categories: Minimal, Immediate, Delayed, and Expectant. At every level, the medic will tag their patients with color-coded tags that indicate to the next higher evacuation facility. A marine with a simple lacerations, sprains, or uncomplicated bruisings, would in the field be considered minimal; these are normally tagged green by the medic, and are the light walking wounded. Immediate is those casualties who are severely wounded and must be treated NOW, or they will die. What is more important is that they CAN be treated with what the Medic has available. These patients are tagged as red. A marine who has more severe injuries then are considered minimal, but are not life threatening, are considered delayed. Patients with delayed status are tagged yellow. A simple fracture of an arm, which is not causing additional internal damage, will be delayed. A projectile wound that is normally tagged red, which is bandaged and cleaned can be down checked to yellow. Finally there is the expectant level, with two different color tag levels, Blue and Black. If a marine is wounded so badly that the field medic cannot save their life they are classified as expectant. However if there are stasis chambers available, they will be tagged

Blue, this is normally only possible if an ambulance vehicle is nearby. However if no chambers are available then the patient is tagged Black, and the medic will attempt to make the patient as comfortable as possible without neglecting his other patients.

Following the very important diagnosis stage, then there is taking into consideration of resources stage. An example from above is the availability of Stasis Tubes. Other considerations are personnel, supplies, facilities, and records.

In the field, the Medic is most often only able to rely on his own skills and the basic first aid skills that the marines around him have, sometime the casualty themselves is the only help the medic will have. Unless the Medic is an I-Medic or higher in capability, he will not be performing advanced procedures in the field. However if he is trained, or if there are more than one medic on the scene, what would be red-tag situation that could be elevated to a Blue or even Black tag situation can be resolved. From simple CPR where two marines can perform better than one, and a helping marine can do, until the medic can set up the equipment and bag to do it autonomously, to one medic holding down a pressure point, while another sets up a trauma bandage and then dermal regeneration equipment.

Supplies, the field Medic has to carefully husband their equipment and material. Once the C-Medic has exhausted the supplies in his FMD-54C, then he has to start improvising. The reason that the C-Medics have gotten into the habit of having their fellow marines carry extra "scoop and runs" so that they will have more of these vital kits. However, there will come the time, when all of the kits are empty, or the just isn't available that one more stasis tube, or the styrolite has all been prematurely exposed to light and ruined. Then the Medic will have to make a choice. And these choices are never easy.

The next consideration is facilities. Will the medic be exposing the casualty to more medical danger by operating in what is normally an unsanitary if not filthy environment? If Stasis tubes are available, is it better to Blue Tag a patient, if trying to fix a major wound will cause it to become untreatably septic? Marines operate in many different environments, and often the power armor is the only thing keeping the environment from killing them. If the Medic has to choose between sealing the armor and treating later, or letting a caustic atmosphere kill the patient while treating a missile wound, the answer is simple, even if aggravating.

Finally medical records. You have a marine wounded, his arm has been severed by a grenade blast, and you need to give him vascular constricting drugs, antibiotics and painkillers before treating the wound. Which drugs is he allergic too? Which ones will kill him faster than the wound itself? Fortunately, every power suit has that marine's medical records available for download or hard format access. The unit Medic will already know the needs of each of his unit's members. But in the fog of combat, units combine, armor is shorted out, records damaged, and the Medic has to decide sometimes to triage a patient sans-medication so as to cause no further harm.

Next, the tactical situation stage has to be considered when triaging the casualties. Are you under fire? Is further contact and combat imminent or hours or even days away? Is Evac available either by transporter, shuttle, or by foot? For the medic in the field, treating the casualty is almost always under fire, they do call it Combat-Medic for a reason, however sometimes due to accidental or random artillery rounds, booby traps, or simple 'falling into a ditch and breaking your leg' accidents, the Medic will have much more time to treat even Yellow or Green tag situations. Conversely, if the position is about to be overrun, and every rifle makes the difference between survival or the entire force being wiped out, then Red Tag casualties

who can still pull a trigger, will get a trauma bandage slapped on, some painkillers put in, and his rifle handed back to him. Yellow Tags will get the priority, but just long enough until the unit survival is guaranteed and then its back to the Red Tags.

Following the flurry of combat, there is a pause as each side recovers, and rests. This pause can be a few minutes, hours, even days. Sometimes the unit will be in pursuit of the enemy force; sometimes they will be withdrawing to avoid further contact with a larger force. This information is as vital to the unit medic as it is to the unit leader. Because of this the unit leader (and his replacements) is trained to inform the medic immediately of the tactical situation. The medic then can use this information to decide whom to start treatment on first. In the cases of advances, he may need to dragoon one of the line marines to stay with the recently stabilized casualties as the medic continues to moves forward with the unit. Conversely if a withdrawal is in order, the medic will need to grab litter bearers. Either way, certain Red Tag procedures may need to be postponed until the unit is settled. The longer the pause between contact is, the more able the medic will be to deal with the more severe Red Tag situations, and then be able to work down from there.

Finally, what is the evacuation (Evac) availability? Even the worse Black Tag situation, can sometimes be saved if they are able to be transported to the sickbay of an overhead starship. And even simple Green Tag casualties can downgrade quickly, if the unit is in a full retreat, and their wounds can neither be treated nor evacuated. Often the situation will present the field medic the choice of who gets the stasis tube, and who he has to treat, and who he has to Black Tag, because he knows that with the Evac availability, he is it, and he has to treat all of the casualties with that gloomy thought in mind.

Personnel, Resources, Tactical Situation: the Combat Medic more than any other situation, will have to take all and most importantly the last qualifier into consideration. He or she is a Marine, but they also must abide by the First Aid credo – Do No Further Harm. Not a fun choice, but one the Combat Medic is well trained for.

PART TWO: TRIAGE AT THE AID STATION

The next medical level we will look at is the Aid Station. Set up at Fire Bases, forward HQs, or at any facility close to the front line, but theoretically away from direct contact with the enemy. The main distinguishing trait that the Medic (usually an I-Medic) will deal with here, is casualties from many different units, that the medic know nothing about, except for the attached records and the notes the C-Medic has attached before sending in the patient from the field. However the same three concerns affect the triage of the casualties but with different levels of importance than in the field: Diagnosis, Resources and Tactical Situation.

First the Diagnosis stage: most often the C-Medic in the field has already performed the diagnosis, performed initial first aid, some follow-up treatment, and then evacuate the casualty back to the aid station. However, the aid station will need to 1) confirm the diagnosis, and 2) ensure that the patient has neither worsened in their condition, or sustain further injuries during the Evac. The triage tag will be pulled and read for each patient, then the medic confirming the diagnosis will scan the patient, electronically as well as manually. Depending on the quantity of casualties that are arriving at any given time, this can take as long as ten minutes or as short as ten seconds, long enough to set priority on who gets seen by who and in what order. Again the same rules apply, those who have minimal non-long term injuries can wait longest, those who have injuries that must be treated but are not life threatening will wait some, and those who

have life threatening injuries that “can” be treated at the aid station will go first. The exception again will be those who cannot be treated at the aid station, but have available stasis chambers, will be blue tagged and put into a chamber immediately, so as to arrest the injury at the earliest possible point. Those who are not expected to survive with the resources available, again, will be made as comfortable as possible to preserve the Marine’s dignity until the end.

Again following the very important diagnosis stage, then there is taking into consideration of resources stage. An example from above is the availability of Stasis Tubes, Plasma for the various races of the Federation, and the myriad of materials used in Aid Station procedures. Other considerations are personnel, supplies, facilities, and records.

At the aid station the Medic who usually is an I-Medic, trained in much more advanced procedures, normally has the assistance of several C-Medics, thus the combination of their skills can mean the difference between life and death for the casualty, in addition the marines assigned to the Aid Station, has guards and orderlies have by exposure to the business of the Aid Station acquired more advanced first aid skills than the normal line marine. Because of this multiplicity of trained medics and marines, Blue and sometimes even Black tags can be down-checked to Red tags, and often resolved at the Aid Station before being sent to the MSH as a Yellow Tag.

Supplies, the aid station Medic has the ability to stockpile supplies, and even have a few extra stasis tubes stashed away or serving as the basis for operating tables. One will often see a couple dozen FMD-54C, lying around ready to be scavenged in a moment’s notice. As well the I-Medic will be able to have dermal regenerators, and other advanced equipment, too fragile to actually have on the front line. In addition the Aid Station will have a much larger version of the scoop and run, the FMD-54I Independent Duty Medic Field Medical Kit. This suitcase-sized

affair contains a larger quantity of nearly everything in the 54C kit for treating more patients. More types of IV fluids and drugs are available to the I-Medic also, as well as a neural stimulator, laser scalpel, tissue regenerator, and laryngoscope. With this additional equipment, the simple matter of not having enough supplies, seldom plays into the Triage decision, again with the exception of those situations when stasis tubes become unavailable. However, during the heaviest of fighting plasma supplies do run low, and sometimes the I-Medic will have to down-check one patient over another for the simple fact that there is the life-giving blood for one, and not for the other.

The next consideration is facilities. The Aid Station usually as the luxury of using a Mobile Operating Room Equipment or (MORE). Structurally, the MORE is just a smaller version of the EMU. It has a larger transit package, though, because of its expanded equipment complement. In addition to all the equipment employed in the EMU, the MORE also carries a biobed equipped with a Surgical Support Frame (SSF). This is the familiar clamshell affair that deploys from the sides of the bed when needed. Above the biobed is an overhead sensor cluster for diagnostics and monitoring. This fully equipped biobed requires its own computer micro-core as well, and a much larger med kit is used. This portable structure provides for a sanitary and controlled environment, allowing the I-Medic to remove the Marine's power armor safely without exposing him to either a harsh environment or airborne pathogens. This then reduces/removes the triage concern of the environment and allows the I-Medic to more focus on the injury itself.

Finally medical records. Every marine who comes in should have their medical record either integrated into their power armor suit, or downloaded to their triage tag. However sometimes both of these resources have been made unavailable, the I-Medic needs to know what courses of treatment are potentially more harmful than the injury itself. Each MORE is equipped with a Database that links the specific DNA of each Marine detached to combat on the planet that

MORE is on. Which ever unit the marine is attached too, no matter how lost he may have become as a casualty, the I-Medic will know who they are, and what treatment is best for him. However, even this failsafe is not perfect, power may be disrupted, the computer the database may be on, could be down, etc. Then the I-Medic must rely on his tricorder, and more basic universal skills and medications to treat the casualty.

Next, the tactical situation stage has to be considered when triaging the casualties. Is the Aid Station under fire? It can happen, artillery, strafing, orbital bombardment are all possible events. Is the contact and attack by the combat imminent or hours or even days away? Will a breakthrough happen during an operation? Is Evac available either by transporter, shuttle, or by foot? For the I-Medic at the aid station all of these factors are a concern, and that is why the road to I-Medic always begins with being a Combat-Medic first. Unlike triage in the field though, casualties at aid station are rarely able to participate in the defense of the station itself, so the only consideration is if the position is about to be overrun, and how fast can the casualties; those awaiting attention, those under attention, and those recovering can be evacuated. If beginning an operation will place the casualty at more risk due to a bug-out, then a lower level patient may be taken first. I-Medics will use every last second to treat their charges, and it has been know for medics to have to be carried off by force, to get them to safety.

Because of the usual exposed position of an Aid Station, a small guard unit (usually a squad of 12-13 marines) will be assigned to protect and assist the station. The NCO in charge of this unit is linked to the Company and/or Battalion XO's net. This enables the NCO to get enough advance notice and pass it on to the I-Medic on what is going on at the front, and which direction the Aid Station may need to move at a moment's notice. The medical team is trained along with their guards to move the MORE quickly forward following the front, or to the rear, if the tide of war turns against the marines. In addition the I-Medic will check with the NCO before

starting any long drawn out procedures, so as to enable a higher chance of completion and thus a successful operation. Just like with the field medic, the longer the time span the I-Medic has to deal with casualties, the more able the medic will be to deal with the more severe Red Tag situations, and then be able to work down from there.

Finally, what is the evacuation (Evac) availability? Here the Aid Station has the advantage of some extra equipment, transport pattern enhancers; can enable site-to-site transfer to a transporter pad at the MSH. But the old standby of aero-ambulance, ground transport ambulances and even stretchers can be a lifeline to get a stabilized casualty back the rear MSH facilities. Like the choice presented to the field medic, the I-Medic has the choice of who gets the stasis tube, and who he has to treat, and who he has to Black Tag, because he knows that with the Evac availability, he is it, and he has to treat all of the casualties with that gloomy thought in mind.

Personnel, Resources, Tactical Situation: the Independent Medic will have to balance the resources most, as the fluid situation of combat will tax their ability to adapt and protect their patients. But he or she is a Marine, but they also must abide by the First Aid credo – Do No Further Harm. Never an easy task, but one the Independent Medic is well trained for.

PART THREE: TRIAGE AT THE M.S.H.

The next medical level we will look at is the M.S.H or Mobile Surgical Hospital. Set up at permanent Fire Bases, as independent facilities near the front lines, or as a temporary hospital in a newly erected fort, close enough that the Evac should take more than an hour to get to them, but far enough away, that they would be considered safe enough, long enough, for the

patients and staff to be evacuated if the front line suddenly shifts towards the MSH. The main distinguishing trait that this facility will have fully qualified surgical doctors, the plan of the day is to perform the life saving surgery, that the front line Medics have stabilized the casualty for. With more advanced computerized and diagnostic equipment the Doctors here can treat more situation but still have the same three concerns that affect the triage of the casualties but with different levels of importance than in the field or the aid station: Diagnosis, Resources and Tactical Situation.

First the Diagnosis stage: most often the I-Medic at the aid station has already performed the diagnosis, performed initial treatment and sometimes even some simple surgery, and then evacuate the casualty back to the MSH. However, the MSH will need to 1) confirm the diagnosis, and 2) ensure that the patient has neither worsened in their condition, or sustain further injuries during the Evac. The triage tag will be pulled and read for each patient, then the triaging surgeon or I-medic confirming the diagnosis will scan the patient, electronically as well as manually. Depending on the quantity of casualties that are arriving at any given time, this can take as long as ten minutes or as short as ten seconds, long enough to set priority on who gets seen by who and in what order. Again the same rules apply, those who have minimal non-long term injuries can wait longest, those who have injuries that must be treated but are not life threatening will wait some, and those who have life threatening injuries that “can” be treated at the aid station will go first. The exception again will be those who cannot be treated at the aid station, but have available stasis chambers, will be blue tagged and put into a chamber immediately, so as to arrest the injury at the earliest possible point. Those who are not expected to survive with the resources available, again, will be made as comfortable as possible to preserve the Marine’s dignity until the end.

Once again following the very important diagnosis stage, then there is taking into consideration of resources stage. The same consideration at Aid Station exists for the MSHs: the availability of Stasis Tubes, Plasma for the various races of the Federation, and the myriad of materials used in MSH operating procedures. Other considerations are personnel, supplies, facilities, and records.

At the MSH the marine treating the casualty is normally a trained trauma physician if not a trauma surgeon. A small but highly skilled cadre of doctors and HMedics, all of whom are trained in more advanced trauma procedures, assists them. This combination of skills DOES mean the difference between life, death or even the lack of long term for the casualty. In addition about a third of the C-Medics assigned to the MSH, are veterans of field operations and have the capability to jump in and assist the Doctors on most any procedure. Because of this multiplicity of trained medics and marines, Black tag situations are next to unheard of and even some Blue Tagged individuals can be down-checked to Red tags, and operated on.

Supplies: the MSH has the huge ability to stockpile supplies, and is the source of re-supply for the Aid Stations in their area. The one area that a MSH will run low on is Plasma and species specific medication. For this reason, each MSH will have a Series 7M Medical Supply Replicator on site. While not an end all for medical needs, it will allow the MSH to have to stockpile only those supplies that cannot be replicated. In addition the MSH will have a large quantity of Stasis Tubes, and a repair facility for both the tubes as well as other Field Medic equipment (Tricorders, Medic Gloves, Dermal Regenerators etc). The MSH also has a large supply of FMD-54C (scoop and runs), and a couple dozen FMD-54I Independent Duty Medic Field Medical Kits. With all of this additional equipment, the simple matter of not having enough supplies, seldom plays into the Triage decision, even with the rare situations when stasis tubes

become unavailable. For the MSH surgeon the only supply that they consistently want more of is time.

The next consideration is facilities. The Mobile Surgical Hospital uses a combination of several MORE packages as well as Emergency Medical Units (EMU - pronounced EE-moo). The most utilitarian structure in the inventory, the venerable is packaged in a plasteel container which fits easily inside an aerospace craft or shuttle down to the size of a STARFLEET Type 6. The transit package can be delivered by parachute or cargo trans-porter, and is easily carried by two people with hand-held antigravs. To deploy the structure, the transit package is opened and the exterior shell inflated. The shell is composed of multiple layers of nylex, kevlar webbing, puncture-sealing foam, and mylar. In one demonstration, this shell stopped a ball bearing shot at a speed of more than 24,000kph; the bearing left a large hole in a 5cm-thick steel plate. The shell is fully functional in a zero or hostile atmosphere environment. The 30cm-thick walls compress to about 3cm for transport. Positive pressure is maintained inside the structure by the life support system so that whenever the structure is opened, air flows out rather than in, reducing the chance of contaminants entering the EMU. Also housed in the transit package are duralloy “shelves” that become the inner walls and beams that maintain the outer shell’s shape. A microfusion generator supplies power to the EMU. A 5-way generator provides fields for structural integrity, gravity, defense, eloflage and holoflage. A replicator, computer micro-core, and Aid Station med kit complete the transit package. This equipment set makes the EMU self-contained and rapidly deployable. The EMU is designed to be a modular system, so that more than one can be connected together. The hatch is a standardized unit that is found on all SFMC portable structures and can interconnect the EMU to any other structure in the SFMC inventory. (pp 39-40 Medical Branch Guidebook)

Finally medical records. Every marine who comes in should have his or her medical record either integrated into their power armor suit, or downloaded to their triage tag. However sometimes both of these resources have been made unavailable, the triaging physician/medic needs to know what courses of treatment are potentially more harmful than the injury itself. Each EMU is equipped with a redundant Database that links the specific DNA of each Marine detached to combat on the planet that EMU is on. Which ever unit the marine is attached too, no matter how lost he may have become as a casualty, the MSH staff will know who they are, and what treatment is best for him. However, even this failsafe is not perfect, power may be disrupted, the computer the database may be on, could be down, etc. Then the physician or medic must rely on their tricorder, and more basic universal skills and medications to treat the casualty.

Next, the tactical situation stage has to be considered when triaging the casualties. Is the MSH under fire? It can happen, artillery, strafing, orbital bombardment are all possible events. Is the contact and attack by the combat imminent or hours or even days away? Will a breakthrough happen during an operation? Is Evac available either by transporter, shuttle, or by foot? For the Doctors and Medics at the MSH all of these factors are a concern, and that is why so many of the Medics assigned to the MSH are Combat-Medics. Unlike triage in the field though, casualties at the MSH are rarely able to participate in the defense of the station itself, so the only consideration is if the position is about to be overrun, and how fast can the casualties; those awaiting attention, those under attention, and those recovering can be evacuated. If beginning an operation will place the casualty at more risk due to a bug-out, then a lower level patient may be taken first. Like the I-Medics at the Aid Stations, the MSH surgeons will use every last second to treat their charges, and it has been know for doctors and medics to have to be carried off by force, to get them to safety.

Because the MSH is not usually in an exposed position, one would not consider a need for a guard unit. However, because of the value of the facility and staff, and the fact that it is pretty well known universally that Federation Doctors strictly abide by the Hippocratic oath in regards all species, the capture of a MSH, is a valued prize to a hostile force. Thus, a small guard unit (of a platoon with about 40 marines) will be assigned to protect and assist the station. The Officer in charge of this unit is linked to the Company and/or Battalion XO's net. This enables the OIC to get enough advance notice and pass it on to the MSH's senior officer on what is going on at the front, and which direction the MSH may need to move at a moment's notice. The medical team is trained along with their guards to move the MEMU quickly forward following the front, or to the rear, if the tide of war turns against the marines. In addition the MSH Senior Officer will continually check with the OIC to ascertain the status of imminent combat operations, so as to prepare the Surgeons and Medics for any incoming casualties.

Finally, what is the evacuation (Evac) availability? Here the MSH has the huge advantage of some dedicate transport equipment with pattern enhancers, which can enable site-to-site transfer to a transporter pad at a Base Hospital or overhead Starship. In addition the MSH has organically assigned to it three Valor as well as four Valkyrie aerospace ambulances, and at any time four Ambulance variants of the Smith-Webber IFV will be assigned to assist in the transport of casualties to and from the Aid Station, and if needed to and from the Base Hospital.

Personnel, Resources, Tactical Situation: the like the Independent Medic – the MSH Surgeon has to balance the resources available, he cannot control the combat, often cannot even see what or where the combat is going on, but soon he will be inundated with patients, who will need his skills and his judgment. They are Marines, but they are also Doctors, and the balance between these two roles in making Triage decisions is never an easy one, no matter how much training they have.

PART FOUR : TRIAGE AT THE HOSPITAL

The next medical level we will look at is at the Hospital. Set up at permanent Fortifications, onboard larger Starships or dedicated Hospital Ships, or at the Starbase facilities throughout the galaxy. They are generally not close enough for an Evac of less than a day, unless by transporter if the facility is on the same planet as the combat, or at aboard a starship in orbit. The main distinguishing trait that this facility will have not just fully qualified surgical doctors, but entire wards dedicated to each of the Triage categories, so that instead of casualties having to wait their turn, they will be directed to the appropriate treatment ward for their level of injury. However even with this situation the Doctors and administrators have to take into consideration the three triage concerns: Diagnosis, Resources and Tactical Situation.

First the Diagnosis stage: each SFMC/Starfleet Hospital will have an emergency room, that examines each patient IMMEDIATELY upon arrival, and classifies them on where they need to go. Often the escorting medic can direct ambulatory patients (Green and Yellow Tags) to the Treatment Wards appropriate to their injuries and needs. Red/Blue and even Black tagged patients will go into the ER, and often straight onto a table to stabilize them. All SFMC/Starfleet Hospital ER Beds are also Transporter capable, and will transport the casualty to the appropriate operating theatre elsewhere in the facility, as soon as the patient is stable enough for transport. Often when a patient arrives in a stasis tube, the entire tube will be transported to the appropriate location, after the ER surgeon has checked the external monitoring controls for patient status. Patients coming from MSHs, Aid Stations and even sometimes straight from the Field Medic will be examined quickly to 1) confirm the diagnosis, and 2) ensure that the patient has neither worsened in their condition, or sustain further injuries during the Evac. The triage tag will be pulled and read for each patient, then the triaging surgeon or nurse confirming the

diagnosis will scan the patient, electronically as well as manually. Again depending on the quantity of casualties that are arriving at any given time, this can take as long as ten minutes or as short as ten seconds, long enough to set priority on who goes to what ward and in what order. Unlike the lower level facilities, no patient is considered Black Tag, unless they have religious proscriptions against "extraordinary" or "heroic" Interventions, if so then these patients will be made as comfortable as possible according to their racial requirements.

Once again following the very important diagnosis stage, then there is taking into consideration of resources stage. The same consideration at Aid Station exists for the MSHs: the availability of Stasis Tubes, Plasma for the various races of the Federation, and the myriad of materials used in MSH operating procedures. Other considerations are personnel, supplies, facilities, and records.

Once again following the very important diagnosis stage, then there is taking into consideration of resources stage. Here the major restriction is how many operating theatres are available at one time, and how many surgeons, all other resource needs are usually quite able to be met by in house replicator facilities Other considerations are personnel, supplies, facilities, and records.

At the Hospital's trauma receiving area the physician first treating the casualty is ALWAYS a highly trained trauma if not a trauma surgeon. A very efficient and highly skilled cadre of doctors, nurses and I-Medics assists them, all of whom are trained in more advanced trauma procedures. This combination of skills DOES mean the difference between life, death or even the lack of long term for the casualty. In addition about half of the I-Medics assigned to the trauma ward are veterans of field operations and have the capability to jump in and assist the Doctors on most any procedure. Because of this multiplicity of trained medics and marines, nearly every casualty that makes it to the trauma room alive, will remain that way.

Supplies: A Starfleet Marine Corps Base Hospital, or even a Starfleet Hospital ship has an almost unlimited ability to replicate medical supplies, only the rarest of medicines, plasmas, or otherwise species specific items have to be stockpiled, and these will be kept in a more than adequate supply for those marines, and any non-combatants in or near the battle front. All other types of supplies, from bandages to styrolite to even equipment can be replicated upon demand whenever necessary. Physical supplies ceases to be a triage factor at this level, and if it all else fails, and the one thing needed to heal the patient in unavailable and unable to be replicated, than those patients will get priority on available hospital stasis facilities.

The next consideration is facilities. A Fleet/Corp Hospital or Hospital Ship uses a combination of Triage level wards to treat casualties in the most appropriate manner. The Trauma Wards where Red/Blue/Black tag casualties go, are equipped with long rows of trauma tables, each equipped to beam the patient to a waiting operating theater. The most advanced use of holo-technology in the theaters allows the doctors to integrate seamlessly with the medical tools and technology to save lives. Any patient who cannot go into an operating theater immediately will be transported into stasis facilities; into they can be revived and operated upon appropriately. The one thing facilities like these can do is trade space for time. Yet one more stasis tube can be set up, as often as needed to preserve the lives of our fallen but not yet lost marines.

Finally medical records. Every marine who comes in should have his or her medical record either integrated into their power armor suit, or downloaded to their triage tag. However sometimes both of these resources have been made unavailable, the triaging physician/medic needs to know what courses of treatment are potentially more harmful than the injury itself. Every Fleet/Corps Hospital is equipped with a multiple-redundant Database that links the specific DNA of every Marine in the sector that the Hospital is in. Which ever unit the marine is attached too, no matter how lost he may have become as a casualty, the Hospital staff will know

who they are, and what treatment is best for him. However, even this failsafe is not perfect, power may be disrupted, the computer the database may be on, could be down, etc. Then the physician or medic must rely on their tricorder, and more basic universal skills and medications to treat the casualty.

Next, the tactical situation stage has to be considered when triaging the casualties. However for Base Hospitals there is not much that can be done, if for some reason they are threatened. They cannot be moved, and the vast quantity of patients makes it difficult to evacuate them all safely (see below). However, if the enemy that is making the break through is known for killing wounded prisoner, then all means will be taken to evacuate them. In the situation of the Hospital Ship, these vessels are much more build for speed than combat, and will flee any combat if possible, and proceed to safer Federation space at all haste. Thus, if there is a possibility that a base hospital will come under attack, the Chief of Surgery will delay any operations that will require time that conflicts with any required evacuation, and in these situations a Stasis Tube will be broken our of storage or replicated as needed. The Commander of the Hospital will have a Marine Guard Company assigned to its defense/security, and both the OIC and the Commanding Officer will stay in constant contact with the local SFMC combat Commander, if necessary.

Finally, what is the evacuation (Evac) availability? A Base hospital will have a small fleet (30-40) organically assigned Valors as well as Valkyrie aerospace ambulances, and at any time twenty- four Ambulance variants of the Smith-Webber IFV will be assigned to assist in the transport of casualties to and from the Base Hospital. In addition most Hospitals are now being assigned three Danube class Runabouts for long-range transport/evacuations of patients and casualties.

Personnel, Resources, Tactical Situation: the like the MSH Surgeon, the Commanding Officer of a Base Hospital and his Chief Surgeon have to balance the resources available, they cannot control the combat, often cannot even see what or where the combat is going on, but soon they will be inundated with patients, who will need his skills and their judgment. They are Marines, but they are also Doctors, and the balance between these two roles in making Triage decisions is never an easy one, no matter how much training they have.

CLOSING

We have reviewed and analyzed the differences in Triage between the Field, the Aid Station, the MSH, and at the Fort Hospital or Hospital Ship. At the Field Level, the key is the individual Combat Medic, and how he or she handles the fact that they are all that stands between the injured marine becoming a permanent casualty, or being able to survive another day. At the Aid Station, there is an ability to store some supplies and materials becomes less of a triage concern than the actually military situation. At the MSH, it is the doctors and the paucity of time to deal with all of the casualties that channels the triage decisions. And finally at the hospital, it is the availability of operating theaters and surgeons that determines the triage decisions.

So where do we go from here? As I have found throughout my research, education is the key to the continued growth of the SFMC. This is important to the individuals of the Corps, and also to the units, chapters, brigades and the Corps itself. The Corps is as strong as its marines, and these marines will be as strong as they are smart. Thus the next research will be into the importance of continuing education to the SFMC Marine; from the lowest ranking Private to the most senior General, all need to stay sharp and on top of their game.

Following this, or even during this author himself needs to further his education and take First Aid Responder / CPR training, and then the SFMC-A's MD-23 Combat Medic training. While never expecting to have to serve as a combat medic, another trained set of hands will never hurt the mission.

Finally, a look at alternative approaches to Branch specialization will need to be looked at, as a result of the lessons learned in this research. A joint project with Deputy Commandant, Brigadier General Aaron Murphy will explore the Maritime aspects of the SFMC.

Specifically to Triage, we have learned many things, that where you are when triaging and treating the patient is as important as the injury itself. That the more people that are trained to deal with trauma casualties, the higher the level of survivability for the casualty. And finally the one thing that is intuitive, that the more established and equipped a facility is for medical treatment, the higher the level of survivability AND recovery is for those casualties.

What then do we suggest for triage and combat medicine? More equipment and supplies at the front is a must. Every marine's Powered Armor can and should be equipped with a smaller version of a "scoop and run" medical pack, with species-specific meds for the marine in that armor. Every marine has he or she goes to more and more advanced professional and/or branch training should get more and more in depth first aid training. And finally, promotion credit should be given to every marine who gets First Aid Responder / CPR training and completes MD-23 Combat Medic. The life they may save, is a marine's life, and thus very valuable to the unit, the Corps, and the Federation.

> Some patients, though conscious that their condition is perilous, recover their health simply through their contentment with the goodness of the physician. - *Hippocrates 460-400 B.C.*

Appendix One
The Triage Tag System

Excerpted from the Medical Branch Manual pp. 74-75

Tagging

Each triaged patient is given a colored tag, usually placed around the neck or extremity. This tag consists of a card on which the patient's life signs and tricorder diagnosis can be written. A special triage printer peripheral can be used with the medical tricorder, which will produce self-adhesive labels for the tags that contain the same information. On the back of the tag is a pocket for an isolinear optical chip with diagnostic tricorder data if avail-able.

Each tag is color coded on the following criteria.

Black

Black tags are for very severely injured personnel who are not expected to live even if they receive emergency or even advanced medical treatment.

Blue

Blue tags are placed on those casualties which are very severely injured and who would not survive battlefield emergency medical treatment, but who have a reasonable chance of surviving advanced medical treatment if they are placed in stasis now for later treatment.

NOTE: The availability of stasis tubes must always be considered when blue-tagging, and some blue-tags may be down checked to black if more blue tag candidates come in who have a better chance of surviving stasis and treatment than those who are in the stasis tubes now.

Red

Red tags are used for those personnel who are severely injured but who have a reasonable chance of survival with emergency treatment, but who could die or have severe permanent disabilities without it.

Yellow

Yellow tags are placed on personnel who are moderately injured but who will survive, and a short delay in treatment of their wounds will not lead to serious problems.

Green

A green tag is given to the 'walking wounded', those who have minor lacerations, back or neck sprains, or uncomplicated bumps or bruises.

Appendix Two
Field Stasis Tube (FST) unit

Excerpted from the Medical Branch Manual pp. 41

Field Stasis Tube (FST) unit

What makes a portable structure "portable" is that it has to be transportable by shuttle or cargo transporter, and be deliverable by parachute or antigrav. What makes it a "structure" is that it must provide interior space for more than five humanoids.

FST units barely qualify on either account. FST units are ungainly and large. They are difficult to maneuver on the ground, they only barely fit in a cargo shuttle (they are usually transported in the larger T-4 or T-6 aerospace craft), and they require a complex parachute package if they are to land in operable order. While they hold up to 25 humanoids each, the accommodations are stasis tubes that are barely large enough to hold them. But these units can literally be lifesavers.

Sometimes a soldier is wounded so badly that they are not likely to survive emergency surgery even if they could get it right away. If they could be treated while they're body functions were slowed or stopped; or if they could receive highly sophisticated and advanced medical care, they would probably make it. With stasis tubes, casualties can be put "on ice," temporarily suspending all body functions—including their impending death. They can then be "thawed" later and in stages. This allows surgeons to work at a more relaxed pace, or allows transport to a medical facility with the proper treatment facilities.

Despite the "chilly" terminology, stasis patients are not truly frozen or thawed, but placed in suspended animation through a complex package of neural calipers, artificial fluids, force fields, and a reduced internal temperature (although nowhere near freezing).

Appendix Three
Ethical Issues in Clinical Medicine – Extraordinary or Heroic Measures

From Harrison's On Line:

Futile Interventions
Autonomy does not entitle patients to insist on whatever care they want. Physicians are not obligated to provide futile interventions that have no physiologic rationale or have already failed. For example, cardiopulmonary resuscitation would be futile in a patient with progressive hypotension despite maximal therapy. But physicians should be wary of using the term "futile" in looser senses to justify unilateral decisions to forego interventions when they believe that the probability of success is too low, no worthwhile goals can be achieved, the patient's quality of life is unacceptable, or the costs are too high. Such looser usages of the term are problematic because they may be inconsistent and mask value judgments.

Conflicts Between Beneficence and Autonomy
Patients' refusals of care may thwart their own goals or cause them serious harm. For example, a young man with asthma may refuse mechanical ventilation for reversible respiratory failure. Simply to accept such refusals, in the name of respecting autonomy, seems morally constricted. Physicians can elicit patients' expectations and concerns, correct misunderstandings, and try to persuade them to accept beneficial therapies. If disagreements persist after discussions, the patient's informed choices and view of his or her best interests should prevail. While refusing recommended care does not render a patient incompetent, it may lead the physician to probe further to ensure that the patient is able to make informed decisions.

Extraordinary and Ordinary Care
Some physicians are willing to forego "extraordinary" or "heroic" interventions, such as surgery, mechanical ventilation, or renal dialysis, but insist on providing "ordinary" ones, such as antibiotics, intravenous fluids, or feeding tubes. However, this distinction is not logical because all medical interventions have both risks and benefits. Any intervention may be withheld, if the burdens for the individual patient outweigh the benefits.

Withdrawing and Withholding Interventions
Many health care providers find it more difficult to discontinue interventions than to withhold them in the first place. Although such emotions need to be acknowledged, there is no logical distinction between the two acts. Justifications for withholding interventions, such as refusal by patients or surrogates, are also justifications for withdrawing them. In addition, an intervention may prove unsuccessful or new information about the patient's preferences or condition may become available after the intervention is started. If interventions could not be discontinued, patients and surrogates might not even attempt treatments that might prove beneficial.

Appendix Four
Evacuation Categories

Handbook for the students of the Combat Casualty Care Course (C4). 2001, http://www.dmrti.army.mil/C4/c4.htm pp 25-27

URGENT - PRIORITY 1 This precedence is assigned to emergency cases that should be evacuated as soon as possible and within a maximum of 2 hours to save life, limb, or eyesight.

URGENT SURGICAL - PRIORITY 1A This precedence is assigned to patients who must have far forward surgical intervention to save life and to be stabilized for further evacuation.

PRIORITY - PRIORITY II This precedence is assigned to sick, injured, and wounded personnel requiring prompt medical care. It is used when the individual should be evacuated within 4 hours or his/her medical condition will deteriorate to such a degree that he/she becomes an URGENT precedence.

ROUTINE - PRIORITY III This precedence is assigned to personnel requiring evacuation, but whose medical condition is not expected to deteriorate significantly. The sick, injured, or wounded in this category should be evacuated within 24 hours.

CONVENIENCE - PRIORITY IV This precedence is assigned to patients for whom air evacuation is a matter of medical convenience rather than necessity.

TRIAGE CATAGORIES
QUICK REFERENCE CHART

BREATHING NO-------reposition airway-----NO------EXPECTANT
YES----- = > 30/min----------IMMEDIATE-------- < 30/min

CIRCULATION---- Capillary Refill >2sec or weak/irregular pulse ---IMMEDIATE
<2sec or strong pulse MENTAL STATUS
Follows simple commands----------DELAYED
Fails to follow commands----------IMMEDIATE

TRIAGE CATEGORIES

IMMEDIATE: Life threatening problems, which should be correctable with immediate medical intervention. Prediction is 20% of the casualties.

EXAMPLES: Sucking chest wounds, tension pneumothorax, respiratory obstruction, asphyxia, maxillofacial wounds with asphyxia or where asphyxia is likely to develop, exsanguinating internal hemorrhage unresponsive to vigorous volume infusion, most cardiac injuries, central nervous system wounds with deteriorating neurological status, unstable chest and abdominal wounds, inaccessible vascular wounds with limb ischemia, incomplete amputations, open fractures of long bones, white phosphorous burns, and second or third degree burns of 15 – 40% total body surface area.

DELAYED: Significant injuries requiring medical care, but in which a delay in giving care will not lead to loss of life or limb. Prediction is 20% of the casualties.

EXAMPLES: Stable abdominal wounds, soft tissue injuries requiring debridement, maxillofacial wounds without airway compromise, vascular injuries with adequate collateral circulation, genitourinary tract disruption, fractures requiring operative manipulation, debridement and external fixation, most eye and CNS injuries.

EXPECTANT: Life threatening injuries unlikely to respond to medical intervention. Prediction is 20% of the casualties.

EXAMPLES: Unresponsive patients with penetrating head wounds, high spinal cord injuries, mutilation explosive wounds involving multiple anatomical sites and organs, second and third degree burns in excess of 60% of body surface area, convulsions or vomiting within 24 hrs of radiation exposure, profound shock with multiple injuries, agonal respirations.

MINIMAL: The “walking wounded.” Prediction is 40% of the casualties.

EXAMPLES: Burns less than 15% body surface area (except for hands, face, genitalia), upper extremity fractures, sprains, abrasions, behavioral disorders or psychological disturbances.

Appendix Five
MD-30 Thesis Submission and Approval

Proposal Submitted:
Proposal Approved:

From: nlynch@zianet.com [mailto:nlynch@zianet.com]
Sent: Sunday, January 06, 2002 9:56 AM
To: Scott A. Akers
Subject: Re: MD-30 thesis proposal

> Below is my proposed MD-30 Thesis, Introduction and Outline.
>
> Please let me know if this will be acceptable.
>
> LGen Scott A. Akers

Sounds good to me. Go ahead and submit your paper when you're ready.

Nancy Lynch

Fr: Scott A. Akers <chunone@nwlink.com>
Sent: 05, January 2002 2027 Pacific
To: Nancy Lynch
cc: Jim Monroe

Subject: MD-30 thesis proposal

Below is my proposed MD-30 Thesis, Introduction and Outline.

Please let me know if this will be acceptable.

LGen Scott A. Akers

Thesis Proposal proper

The silence of the patrol is suddenly pierced by incoming mortar rounds… "WHEEEEEEEEEEEEE, KATHUMP KATHUMP KATHUMP." Dirt flies into the air, and other 'things', a phaser rifle, shreds of power armor, … blood. Red, Green, Ocher, all shades of that vital fluid necessary for humanoid life. And then one more sound, a call that has echoed on the battlefields for millennium…. "MEDIC, Marine Down!!!"

The combat medic rushes forward, his medical bag on his hip, he reaches the crater, and their lies the four marines of the lead patrolling fire team, all are down, all are injured, all are like the medic, under fire. The medic has to decide whom first, who gets those first few precious seconds of treatment, he can't be everywhere at once, and only he can decide.

* * * * *

The aid station has been treating patients on a steady but manageable level for hours, then the call comes in, casualties in bound from the front line, you clear the four aid tables, and prepare the medicines and the staff. Then Sgt Jones pokes his head, a normally calm and collected marine with 15 years of combat experience, you notice his face his very pale, even for a human. "Sir, we have over a hundred casualties coming in, RIGHT NOW"

You grab your tricorder, you know the medics on the front line, you gave refresher training to many of them onboard the *USS LeJeune* as it was enroute to the planet, you know they know their job, and the first two litters you face, you see two of those medics, with bloody mangled chest wounds, and you have to choose, who goes first.

* * * * *

The MSH has been quiet for a week, but you've been alerted that patients are inbound from the Aid Station, Sergeant C'Salek, an outstanding Vulcan I-Medic, is sending some critically wounded but stabilized marines. Seven are in need of thoracic surgery for critical and traumatic injuries to their cardiac system. Evac to an orbital star ship would be nice, if one was still around. Because of the nature of their injuries stasis is the least desirable option. You are the only thoracic surgeon available, the chief surgeon defers to your judgment, who goes first, who waits, who may not make it long enough to hit the operating table?

* * * * *

It's called 'Triage', the process for sorting injured people into groups based on their need for or likely benefit from immediate medical treatment. Triage is used in hospital emergency rooms, on battlefields, and at disaster sites when limited medical resources must be allocated. In this paper, we will analyze in a more detailed manner, the process of Triage on the Battlefield, at the Aid Station, the MASH, and finally the Hospital (Ground or Ship Based). Each of these have a different set of Triage rules, and each will need to be more fully examined for the sake of those Marines who face the enemy on our behalf.

Proposal Outline

OPENING

- A. Introduction
  1. Anecdote
  2. Suggestion
  3. Thesis
- B. Reference to Previous Works
  1. AR-30
  2. SU-30
  3. CE-30
- C. Layout of Paper
  1. Triage in the Field
  2. Triage at the Aid Station
  3. Triage at the MASH
  4. Triage at the Fort Hospital or Hospital Ship

I. Triage in the Field

- A. Diagnosis
  1. Minimal
  2. Immediate
  3. Delayed
  4. Expectant
- B. Resources
  1. Practitioners
  2. Medical Supplies
  3. Sanitary Facility
  4. Records
- C. Tactical Situation
  1. Under fire?
  2. Imminent Actions?
  3. Evac available?

II. Triage at the Aid Station

- A. Diagnosis
  1. Minimal
  2. Immediate
  3. Delayed
  4. Expectant
- B. Resources
  1. Practitioners
  2. Medical Supplies
  3. Sanitary Facility
  4. Records
- C. Tactical Situation
  1. Under fire?
  2. Imminent Actions?
  3. Evac available?

III. Triage at the MASH
- A. Diagnosis
  1. Minimal
  2. Immediate
  3. Delayed
  4. Expectant
- B. Resources
  1. Practitioners
  2. Medical Supplies
  3. Sanitary Facility
  4. Records
- C. Tactical Situation
  1. Under fire?
  2. Imminent Actions?
  3. Evac available?

IV. Triage at the Fort Hospital or Hospital Ship
- A. Diagnosis
  1. Minimal
  2. Immediate
  3. Delayed
  4. Expectant
- B. Resources
  1. Practitioners
  2. Medical Supplies
  3. Sanitary Facility
  4. Records
- C. Tactical Situation
  1. Under fire?
  2. Imminent Actions?
  3. Evac available?

CLOSING
- A. Review of Paper
  1. Triage in the Field
  2. Triage at the Aid Station
  3. Triage at the MASH
  4. Triage at the Fort Hospital or Hospital Ship
- B. Preview of Follow-up Papers
  1. PD-30
  2. MD-23
  3. PD-40
- C. Closing
  1. Thesis-Decision
  2. Thesis-Suggestion
  3. Anecdote

APPENDICES