

Starship Kit - Volume 6.3

Medical & Health Systems



1 ABC 2 DEF 3 GHI

4 JKL 5 MNO 6 PQR

7 STU 8 VWX 9 YZ

0 START



Preface

Starship Kit 6.3 Ship Systems Medical & Health Systems

Ships need to go, to move through space. Virtually all of them need power as well. Those core parts of almost all space going vessels are covered here.

This is part 6.3 of the Starship Kit and covers the medical and health systems you may find on a ship, although it can be used as a standalone product if required. This part covers the environmental systems on a starship, like atmosphere and heating.

Future parts will include:

- Captain & Crew
- Special Features
- Cargo, both Legal and Illegal
- Ship Quirks

This generator/kit is designed to provide the starting points for your own inspiration. Actual details about each system, such as its design or how it actually works is up to you.

Contents

Preface	2
Credits & Legal	2
Ship Systems	3
How to Use	3
Class	3
Medical Systems	4
Artificial Support	4
Atmosphere Control	6
Beds & Wards	6
Diagnosis	7
Experimental	10
First Aid	10
Morgue	10
Nursery & Maternal	10
Pharmacy	10
Quarantine	10
Sanitation	11
Specialised Equipment	11
Treatment	11
Coming Soon	12
Also Available	12

Credits & Legal



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Ship Systems

How to Use

Class

A broad category, this gives an overall indicator of how strong, powerful and complex the system is. As with weapons, this can vary from group to group, but all other things being equal a Mark V system will be better than a Mark IV but worse than a Mark VI etc.

Not every ship will have all of these systems, but the core systems will exist in some form on almost every ship. The core systems are:

- Computing
- Engines
- Life Support
- Navigation
- Power Generation

The only real exception this is life support for drone or autonomous ships.

The secondary systems include everything else, except weapons, armor and shields, as they have been covered by other parts of the SSK.

Class

Roll a d20. That becomes the tier class of the system you are rolling for. If a 20 is rolled then the system is a Capital-class system and can only be placed on Capital class vessels. Alternately, it is just a Mark XX system, with XX determined by the result of the die roll.

Alternately, if you require a more “realistic” system that keeps the higher class systems to a minimum, use the chart below.

D100	Mark
01	Mark I
02 - 03	Mark II
04 - 06	Mark III
07 - 10	Mark IV
11 - 14	Mark V
15 - 19	Mark VI
21 - 25	Mark VII
26 - 30	Mark VIII
31 - 40	Mark IX
41 - 50	Mark X
51 - 60	Mark XI
61 - 70	Mark XII
71 - 75	Mark XIII
76 - 80	Mark XIV
81 - 85	Mark XV
86 - 90	Mark XVI
91 - 94	Mark XVII
95 - 97	Mark XVIII
98 - 99	Mark XIX
00	Mark XX/Capital Class

Quite often, the mark is left off when crew talk about the system, unless there is more than one on the ship and clarification is needed. However, it is useful to know what the tier of a system is as it can have an impact on other systems and the ships size.

Medical Systems

Even the most basic of ships have some kind of medical system, such as a first aid kit. This of course does not apply to drone or other autonomous ships, unless they have been designed to assist in medical operations.

Medical ships would have more of what they need, with a quarantine ship having more Quarantine Chambers when compared to, for example, a Mobile Hospital ship.

Like all other system in the SSK range, the mark class is an indicator of size and effectiveness.

Something to bear in mind as well is the nature of the crew of the ship. If the crew is all the same species, this is not a problem. However, if the ship is to cope with alien visitors or crew, then the medical system need to be able to cope with them as well. This adds at least one to the mark class for complexity and cost determination purposes. The more species they are designed to deal with, the more complex and costly they become.

Unlike the weapon or armor, the medical systems should be chosen and not added randomly. Some of the systems have sub-options that you can roll on for random determination to help make various ships of the same type different.

You could also roll to determine typically how many of a particular medical system a ship would have, modifying the amount as needed, with medical and other specialised vessels having more.

Artificial Support

Artificial Support (AS) systems cover a wide range of systems that are more than just simple tools. They provide backup in case of emergency, can sometimes be more efficient and more delicate when compared to their organic companions.

The mark level for these systems determines how effective, reliable and sophisticated they are. A higher mark system is less likely to need organic supervision and is allowed more autonomy when working. This also pushes up the development costs and reduces the number of places they can be used.

There is a 50% chance that any non-medical ship will have an AS, with a medical ship having a 75% chance, with variations for different cultures etc.

D20	AS Type
1 - 2	Artificial Life forms (A.I.)
3 - 6	Automatic Doctors
7 - 10	Droids
11 - 15	Cyborgs
16 - 18	Holograms
19 - 20	Nano Systems

Artificial Life forms (A.I.)

These are the next step up from droids and are considered by many cultures to be a sentient species in their own right. The forms and primary functions are as varied as organic beings. They are the most sought after, although they can be very cold and logical when it comes to triage etc. their abilities cannot be beaten. But this comes at a price of them being very expensive to maintain and design and, if damaged, repair or replace.

Automatic Doctors

The most simple of AS systems, the Auto-Doc relies on the patient or representative accurate inputting their symptoms (the symptom that the Auto-Doc cannot scan, such as pain levels, history of illness etc.) They can only deal with the crew members they have been assigned to and deal with low level problems, or at least they can stabilize the patient until proper care has been reached. If they encounter anything outside their simple programming they will either deny treatment or attempt to help. The second option can sometimes be worse.

With all these issues, why would a ship have one installed? They are surprisingly cheap to make and design and for non-critical injuries and problems are very reliable.

Droids

The next step up from the Auto-Doc, but not as good as the AI is the Droid-Doc. These beings often do not resemble their creators in terms of looks. They can interact with patients and ask questions. Their main advantage is that because they are not limited to a certain shape or design they can go where other staff cannot, such as the cold void of space, or underwater, or even sometimes into an active reactor core.

Cyborgs

For many, the best of both worlds. An organic being, with technological implants that make them stronger, faster etc. A perfect blend of organic life and technology.

The major downside is that becoming a cyborg is a very unpleasant experience for many beings and as well as having the benefits of being organic and machine they also have the both problems, including implant rejection, diseases, weakness to EMP weapons etc.

Holograms

Hologram based doctors are the cutting edge of AS systems. Being, essentially, projected light, or photon based, they can never get ill. They are perfectly sterile. They can work in virtually any environment. They have instant recall to any database they access to. They are able to adjust their body to make patient more comfortable or to perform delicate procedures. Their own sensors rival that of any portable medical device. In short, many view them as the ultimate AS system that can be designed.

They have several major downsides though.

- Weakness to EMP and power surges run risk of putting them offline
- Limited area of deployment, even with some form of remote projector
- Very expensive to design and maintain
- Have the same weakness as any computer system in terms of hacking or control.
- Some cultures are not used to hologram technology and still do not trust it.

Nano Systems

These extremely small (cell sized or smaller) robots can repair any damage right at the source. They can be injected, in a gel, or even in the ship's atmosphere, performing their duties as and when is needed.

D20	Version Used
1 - 10	Injected
11 - 18	Gel
19 - 20	Atmospheric

They are expensive and extremely dangerous if manipulated by another controlling force.

Atmosphere Control

Apart from atmospheric scrubbers, which help to clean the breathable air useable, some ships also have a form at atmospheric control systems.

This is especially true with regards to medical matters, as some types of atmosphere may be dangerous for some treatments.

Some example AC systems are listed below.

D20	AC system
1 - 10	Emergency Purge
11 - 12	Mood Control
13 - 20	Sterile Atmosphere

Emergency Purge

This purges the atmosphere from one or more areas into nearby space and refills the area with the necessary gasses. There is a slight delay before this can be used again.

Mood control

Certain gases can produce calming effects when inhaled. Prison ships often uses these to keep the inmate under control, although many culture heavily frown on them being used in normal vessels. Rumours abound that a few military or experimental vessels use these to help keep the crew under control or to hinder those who invade the ship.

Sterile atmosphere

A sterile system is one that is free from living germs or microorganisms. These are useful on ships that have to deal with infectious diseases or patients with weakened immune systems. An ultra-clean system that removes harmful materials and sometimes adds chemicals that helps keep the atmosphere clean and sterile.

Beds & Wards

Patients need to rest. They need a place to stay whilst treatment is being administered.

Roll on, or pick from, the table below to determine what type of ward or bed is present. Species with vastly different medical needs will be in separate wards or if the technology is advanced enough, in the same ward. If the system is mark 5 or above then combined species wards are possible, but they will be treated as 2 marks lower in terms of effectiveness and results and 2 higher in terms of costs and complexity.

D20	Type of Ward
1 - 2	Children
3 - 4	Gender - Separated
5 - 8	Gender - Mixed
9 - 11	Intensive Care
12 - 14	Long-Term
15 - 16	Short-Term/Day
17 - 18	Terminal
19 - 20	Specialised

Children's wards

Often designed to be less clinical and scary when compared to adult wards. The beds are smaller, there are activities to help distract them or take their minds off what is going on. The rooms tend to be brighter and more open. Some (25%) even have beds or sleeping arrangements for parents or guardians to stay near their offspring, although this does take up space and reduces the number of beds that can be in the ward.

Gender

Gender based wards are either separated into male-female types or mixed. Many hospitals have both, as there will always be some patients who feel uncomfortable in medical situations around another gender, or who come from a culture that has taboos about such matters.

Intensive Care

Certain injuries are more damaging than others. The IC wards are set up to deal with patients that are critically ill or in an unstable condition. There is much more monitoring equipment. Once stabilised, the patient is moved to another appropriate ward.

IC wards are not designed around comfort. They are designed to be efficient and to save the patient's life. Space in them is at a premium

Long-Term

Some treatments need to be slow and steady to prevent more damage done to the patient. These wards are designed for more long term care.

Short-term/Day

Occasionally a patient only needs to stay in the medical department for a day or so. The operation may

Terminal

These types of wards cover illness and old age. They are designed to make to the last few weeks or days of person's life as comfortable and pain free as possible.

Specialised

These type of wards or beds are set up to deal with one narrow type of problem. Although, in an emergency they can be used for other patients, they will not be as effective. Sometimes having a specialised ward or treatment facilities can make the difference between life and death.

Diagnosis

Before you treat someone, you need to know what is wrong with them. Not every facility or ship has access to the same diagnosis system, but most will have even the most basics, such as blood testing to deal with problems as they occur.

Some example methods and techniques are listed below. Many more exist with some only be suitable for certain species and their names may change from culture to culture.

D20	Diagnostic system
1	Bioluminescence imaging
2	Blood Tests
3	Cell cultures
4	Colonoscopy
5	Dermatoscopy
6	Diffuse optical imaging
7	Fluoroscopy
8	Gamma camera
9	Imaging Gene Expression
10	Infrared imaging
11	Magnetic resonance elastography
12	Magnetic resonance imaging
13	Nuclear magnetic resonance spectroscopy
14	Posturography
15	Radiography/X-Ray
16	Ultrasonography
17	X-ray computed tomography
18	Other : Invasive Diagnosis
19	Other : Minimal-Invasive Diagnosis
20	Other : Non-Invasive Diagnosis

For each method you also need to determine if they are set for the general crew or for specialised races. After all, a system for checking the blood of a human is no good for the sentient plants of Sarday X.

D20	type
1 - 10	General
11 - 20	Specialised

Bioluminescence imaging

Some species cells give off a small, virtually undetectable amount of light, either naturally or when treated with certain chemicals. The amount that is emitted and its qualities can help with diagnosis or certain diseases.

E.g. The Venusian Ultra-Flu makes human skin cells emit a small amount of light when treated with the chemical PC-334-Omega

Blood Tests

A broad term a laboratory analysis performed on a blood sample taken. Different species obviously have different blood types and disorder. Some species don't even have blood in the same way as other species, such as silicon based life forms.

Cell cultures

Another broad category, like blood tests. A sample of the patients' skin or other cells are taken and grown under laboratory conditions and analysed.

Colonoscopy

An endoscopic examination of the large bowel, or equivalent for species whose biology is different from the galactic norm.

Dermatoscopy

The examination of skin lesions with a dermatoscope or UV light magnifier. Not suitable for all species, and a few have a nasty reaction to UV light, so other variations or light sources are used instead, although they are not as effective.

Diffuse optical imaging

This technique measure the absorption as well as scattering properties of biological tissues when IR or other light/EM waves are emitted by a controlled source.

Fluoroscopy

Uses X-rays to obtain real-time moving images of the internal structures of a patient. A few patients have nicknamed it X-Ray TV.

Gamma camera

The gamma camera is an imaging technique used to carry out functional scans of the brain, thyroid, lungs, liver, gallbladder, kidneys and skeleton. Gamma cameras image the radiation from a tracer introduced into the patient's body. This tracer must be tailored to the individual species to prevent a, sometimes fatal, allergic reaction.

Imaging Gene Expression

Imaging genetics allows the direct observation of the link between genes and brain activity

Other medical techniques, medical history and certain behaviours, such as partaking of particular narcotics can affect the results.

Infrared imaging

Sometimes called Infrared thermography, (I.I.), uses a thermal image of the patient to assist in diagnosis. For example, an abnormal heat signature in the patients gut may indicate a parasite

Magnetic resonance elastography

This measures the mechanical properties (stiffness) of soft tissues by introducing shear waves and imaging their propagation using MRI.

Magnetic resonance imaging

During an MRI, subjects lie in a strong magnetic field with radio-frequency waves directed at their body. Through various interactions with the cells and body parts, an image is built up of the inside of the patient's body.

Some species react very badly when exposed to the magnetism this system gives off, so it not used on an unknown species or culture.

Nuclear magnetic resonance spectroscopy

Also known as NMR spectroscopy, this is used by chemists and biochemists to investigate the properties of organic molecules. These systems are not small and are not often found on non-medical ships. Even on star bases they can be rare and the more inefficient ones use a lot of power.

Posturography

A general term that covers all the techniques used to quantify postural control in upright stance in either static or dynamic conditions, such as how they stand or walk or run, or even fly.

Radiography/X-Ray

Radiography an imaging technique that uses electromagnetic radiation other than visible light, especially X-rays, to view the internal structure of a patient.

Ultrasonography

This is an ultrasound-based diagnostic imaging technique used for visualizing internal body structures and soft tissues. Popular among some species for assist in examination of pregnant women and their un-born child.

X-ray computed tomography

This uses computer-processed x-rays to produce virtual slices of the scanned object. Processing allows a 3-d model to be built up in effect creating a 3-d x-ray of the person who has been scanned this way.

Other: (Invasive, Non-invasive, Minimal)

Invasive involves going into or cutting open the patient's body, normally under general anaesthetic to examine or take samples from an area that is hard to examine otherwise.

Non-invasive techniques do not (or should not) damage the body in any serious way at all.

Minimal techniques are ones like the so-called key-hole surgery in which a small incision is made, often under local anaesthetic with the patient being able to go home

Automatic or Supervised?

Something else to bear in mind is are the system automatic and controlled by a computer or are they supervised/controlled by a living or otherwise sentient being?

D20	
1 - 8	Fully Automatic
9 - 16	Supervised
17 - 20	Combined/Minimal supervision

Experimental

New medical techniques and treatments are being invented all the time. Some are for new illness, others for existing diseases and problems

First Aid

Sometimes, injuries occur away from medical staff. A first aid station nearby allows for those who happen to be close to the accident site to treat those injured and help before trained medical staff or system can arrive.

Morgue

It is a sad fact that people die. On long space journeys, you have several options when it comes to disposing of bodies, one of them being jettison into space. But what if your culture has strict rules for the dead or you need to move a body to a certain location, or even to preserve it until a medical expert can determine cause of death?

Nursery & Maternal

On ships designed for long haul trips, especially generational vessels, the need for procreation arises. The resultant pregnancies and offspring

On ships with multiple races, the birthing needs can become quite complex. For example, a species that lays eggs will have vastly different needs to ones that can only give birth underwater.

Pharmacy

Pharmacy is the science and technique of preparing as well as dispensing drugs and medicines. Sometimes this is operated by crew, other times it's fully automated. Quite often it's a mixture of the two, with an auto-dispenser overseen by one of more crew members.

Quarantine

When dealing with new species that you have never encountered, there is a problem with accidental contamination. A virus could contaminate the air supply and infect the crew.

D20	Type of quarantine
1 - 2	None
3 - 10	Isolation : Basic
11 - 18	Isolation + Treatment
19 - 20	Teleportation

None

There is no quarantine system in effect on this ship. This might be down to a particular property of the ship or the crew having perfect immune system or even the simple fact that one was not installed.

Isolation – Basic

This is where the subject(s) is simply observed and minor test performed to see if any contaminants have been brought on board.

Isolation + Treatment

As above except that some kind of treatment is applied, such as a gel or spray that removes most if not all pathogens.

Teleportation

Requires access to teleportation technology. The system automatically removes anything considered harmful. One of the most effective, quick, yet power hungry techniques, they are only as useful as the medical database attached to them and new variations or unknown diseases can slip through the net.

They require regular updates of both the medical databases and the crew baselines to determine what is correct and what is not.

Sanitation

Keeping the ship clean and disposing safely of any waste material is the job of sanitation systems. Sometimes manned, often automated.

D20	
1 - 9	Crew
19 - 18	Automated
19 - 20	Combined

What happens to waste?

What happens to any waste material? This can cover medical waste or other biological. You may wish to have a separate system for liquids and solids. Plus certain chemicals from various different species should never mix.

D20	What happens
1 - 4	Destroyed
5 - 8	Ejected
9 - 12	Recycled/Reused
13 - 16	Stored - Compressed
17 - 20	Stored - Regular Storage

Destroyed waste is vaporised or otherwise reduced to virtually nothing.

Ejected waste is, as the name suggests, ejected once it has been temporarily collected. A few cultures have bans on ships ejecting their waste materials in a populated area.

Recycled/Reused waste is stored and reused somehow, either in food systems or treated in some other way to be useful for the crew or ship

Stored - Compressed & Regular simply store their materials for removal later. Compressed storage is more complex and expensive, but can store a lot more.

Specialised Equipment

This is a broad category that covers medical system that can't be classed under anything else. They are rare to see under normal conditions as they only exist for one medical task.

Specialised Equipment is not only for the diagnosis but also the treatment of problems.

Treatment

Once you have diagnosed the patient you can begin treatment. Sometimes it's just rest, other times.

Some hospital ships dedicated themselves to the treatment of one particular illness, with facilities that any terrestrial based hospital would be envious of.

Rather than list all the possible treatments, which would be beyond the scope and make this publication larger than needed, you can instead decide what types of treatments are available and are encouraged to come up with your own types.

D10	Type of treatment
1	Alternative
2	Drugs
3	Palliative Care
4	Physiotherapy
5	Radiation
6	Rest
7	Surgery - Complex
8	Surgery - Minor
9	Toxicology treatments
10	Other

Coming Soon

Keep an eye out for these upcoming products from Ennead Games (in no particular order)

Empire Builder Kit History Generator

Your empire has been founded, but what will happen now? Use the history generator to help you create the past, present and future of your mighty empire.

Prison Kit

Sometimes you need a place to hold those dastardly villains. A multi-part kit series that will cover the prison, security and the inmates, their crimes and those who guard them

Spell Generator

For those times you need to create a spell but just can't decide what it does.

Pantheon Kit

A multiple series of generators linked around creating your world's pantheon and gods!

Also Available

Other products from Ennead Games

Background & Details Kits Fantasy + Scifi

Need some background details for your characters? You can't decide how many children they have or what their hair style is?

Well worry no longer. The BADK is for you. Currently available in two versions, one themed for fantasy characters and the other for sci-fi characters, the BADK will give you enough options and suggestions to get the creative juices flowing for a long time,

Technobabble Generator (Standard, Extended and Steampunk)

Technobabble is a staple of any sci-fi game or story. It helps with emersion and makes impressive sounding technology.

3 versions of the technobabble generator are available

- Standard – Basic technobabble generator
- Extended – Takes the Standard version and adds more options and solutions for your technological problem
- Steampunk – Technology goes steampunk with this version that adds wonderful devices and the names of those who invented them