Medication Overdose/Adverse Reaction Cliff

Branch Baseline

The World Health Organization (WHO) defines an adverse drug event as a *response to a drug that is noxious and unintended and occurs at doses normally used in man for the prophylaxis, diagnosis or therapy of disease or for modification of physiological function or that is caused by drug interactions, allergic reactions and medication errors. The definition includes events due to overdoses and those occurring as a result of non-adherence.* (Al-Tajir, 2005)

Sedative-hypnotics are a group of drugs that cause CNS depression. Benzodiazepines and barbiturates are the most commonly used agents in this class. Other agents include the nonbarbiturate non-benzodiazepine sedative-hypnotics. All the sedative-hypnotics are general CNS depressants. Most of the serious ingestions are suicide-related. Barbiturates have the highest morbidity and mortality of the sedative-hypnotics. Pure benzodiazepine ingestion usually causes little more than sedation and ataxia. Death from sedative-hypnotics is caused by respiratory arrest. After ingestion, the onset of effects occurs within 15 minutes and peaks in 1.5-2 hours. Elimination of Gamma-hydroxybutyrate (GHB) is rapid (elimination half-life 1-2 h). The duration of clinical effects is 2-8 hours. (Cooper, 2009)

Given all toxicologic presentations, pure opioid ingestions are generally a small proportion of ED overdose cases. Peak effect generally is reached in 30-45 minutes with the intramuscular route, and 90 minutes with the oral route. The predominant cause of morbidity and mortality from pure opioid overdoses is respiratory compromise. (Stephens, 2010)

Reports of medication overdose in flight have been very rare. Two cases reported appear to be limited to sedating side-effects from sleep medication. In these cases there was no need for definative treatment and no reported mission impact. (Johnston, 2011)

Incidence Data Included in the Model

The model imports the following incidence information from the IMM database: incidence data category, space adaption status, incidence data, incidence and occurrence distribution data and incidence data characteristics. Data category defines the type of data available for incidence calculations (i.e. raw data vs. fixed data). Space adaptation identifies medical events that onset occurs in the first 5 days of flight and does not reoccur. Incidence values vary by data category and define the number of medical events per person-year or medical events per person-at-risk for each medical condition. Incidence values can be modified by crew characteristics such as gender. Modifying characteristics are noted below and incidence values are listed individually for each characteristic. Distributions are assigned to medical events incidence values and occurrences in the model. For each crew member in a given trial, the incidence and number of occurrences of each medical condition are randomly selected from these probability distributions. Detailed descriptions of the distributions are included in the IMM Technical Description Document.

Incidence	
Data Category:	In-flight
Space Adaptation:	No
Incidence Type:	Rate

Distribution Data	
Incidence:	Gamma
Occurrence:	Poisson

Data Characteristics	
Events:	2
Person Years:	45.49
Space Flight Incidence Rate (Events / Person Years):	2 / 45.49 = 0.043965706748736

Incidence Comments

We have an anecdotal report of two events in space flight. These events were caused by sleep medication. There was no information on which specific medication or dosages were taken. One crew member had some difficulty awakening the following morning. The crew member did not require medication to counteract the effect of the sleep medication, woke up on their own, and there was no mission impact. (Johnston, 2011) Therefore this event would be classified as a best case scenario. There was no documented description of the second event.

Medication side-effects in space flight have been investigated by Putcha and Locke. Their reports on the incidence of reported side-effects are 15% and 12.5% respectively. (Putcha, 1999), (Locke, 2011)

Integrated the real world system incidence data (Saile, 2017).

Updated the Person-Years based on the revised real world system integrated incidence data. The integrated person years changed from 18.17 to 18.13 so the conditions person years changed from 45.53 to 45.49(Saile L., 2017)

Information Regarding Prevention

Selection criteria

Disqualifying conditions include: Any behavior or mental condition that in the opinion of the MSMB makes or is likely to make the individual a hazard to flight safety, crew coordination, or mission execution. The following disorders or history thereof are permanently disqualifying for ISS duties: psychotic, bipolar, dissociative, impulse control ,somatoform, factitious hallucinogen persisting perceptive disorder, paraphilia, abuse or neglect of a child or adult. Disorders that interfere with social or occupational functioning or that require ongoing treatment: Narcolepsy, and Personality Disorder. Delirium, Dementia, Amnesia. Adjustment Disorder, if the episode exceeded 6 months, hospitalization was required, three or more episodes have occurred, and use of psychiatric medications (other than symptomatic use of anxiolytics or hypnotics for a period of less than 30 days). Gender Identity Disorder. Substance Abuse or Dependence. (Note: Nicotine-related Disorders are not necessarily disqualifying) History of a Substance Abuse or Dependence. (Note: Consideration for waiver requires completion of an approved treatment program, total abstinence for at least 90 days after the program, and active participation in an after-care program) Characterological behaviors that show evidence of immaturity, instability, impulsiveness, lack of judgment, or an impaired capacity to adapt to stressful situations. (International Space Station Program, 2009)

Incidence Level of Evidence (LOE)

The IMM level of evidence appropriate assessment of the quality of the IMM input data. Since IMM incorporates input data from a wide variety of sources including astronaut population, terrestrial or analog populations, and external models, an innovative approach to assess the quality of input data was required. Information obtained from the astronaut population and/or space flight is the more relevant so it is assigned the highest level of evidence and less relevant data sources are assigned a lower level of evidence.

Citation	LOE Value	LOE Category
Johnston, 2011	2	Incidence
Saile L., 2017	1	Incidence

Alternative Incidence Data

Analog Populations

An analysis of 10 years of data collected on US Navy Polaris submarine patrols over the ten year period 1963-1973 reported a total of 1685 medical events treated. Illness rates are indicated as new/cases/1000 man-days. There were a total of 97 general medical diseases during the 1968-73 period with an illness rate of 0.0219. There were total 2 drug reactions; causing 4 sick days, 2 sick days, average per event. There were no EVACs and no deaths. Illness rate and rate of days lost were significantly higher than those observed in the surface population (P <0.05) (Tansey, 1979). Rates per person year are 0.0079935 (0.0219 *365 / 1000). Drug reaction events accounted for 2% (2/97) of total general medical diseases, or a rate of 0.00015987. Drug names are not available.

Epidemiology of psychiatric illnesses experienced by US soldiers in combat was obtained by retrospective review of casualty rosters and electronic medical records. Population consisted of 4122 soldiers, 3797 men and 325 women. Age range 18-52, average 27. There were 308 psychiatric casualties, overall 59.8 per 100 soldier combat-years which represented 23% of all disease and non-battle injury (DNBI). Of these 88% were treated and returned to duty. Of the remainder 11% were medically evacuated and 1% died. (Goodman, 2011) All incidence rates are per 1000 at risk combat-years. There were 21substance abuse events. Overall incidence rate was 4.3. By gender, incidence rate was 4.9 for females and 4.2 for males. MEDEVAC occurred to 23.8% (5/21) of substance abuse casualties and there were no deaths. (Goodman, 2011) Substance abuse rates per person year are 0.0043 overall, 0.0049 female, and 0.0042 male. Drug names or types are not available.

By age, the 35 years and older group had the lowest adjusted rate ratio while the 18-23 cohort had the highest; 1 and 1.8; 95% Confidence Interval (CI) 1.21-2.69. By gender, the adjusted rate ratio for males was higher than females; 1 and 1.9; 95% CI 1.39-2.63. Trends are similar to civilian population trends. (Goodman, 2011)

Non-Analog Populations

The US Food and Drug Administration has operated the Adverse Event Reporting System since 1998. It collects all voluntary reports of adverse drug events (ADEs) submitted directly to the agency or through drug manufacturers. Using extracts published for research use, the author analyzed all serious adverse drug events and medication errors in the United States reported to the Food and Drug Administration from 1998 through 2005. In the 8-year period, 467,809 serious events met the study criteria for inclusion in this analysis. Serious ADEs reported to the FDA increased from 34,966 in 1998 to 89,842 in 2005, a 2.6-fold increase. Reported deaths increased 2.7-fold, from 5519 in 1998 to 15,107 in 2005. The overall relative increase was 4 times faster than the growth in total US outpatient prescriptions, which grew in the same period from 2.7 billion to 3.8 billion. Age burden of serious adverse events was estimated for the 18-44 and 45-64 age groups at 25.3% and 33.7% respectively. The patients were more frequently female (55.5%) than male (45.5%), and the sex imbalance was stable over time. Opioid analgesics ranked first as cause of death. No sedatives/hypnotics appeared in the top list. (Moore, 2007)

The National Poison Data System (NPDS) may be considered as providing “numerator data” since the “denominator” is not accurately determined. Attempts have been made to better define the incidence of poisoning. For example, based on the National Health Interview Survey (NHIS), the estimated number of poisoning episodes in the US for the year 2000 was estimated to be 1,575,000. During the same time the American Association of Poison Control Centers (AAPCC) centers received reports of 2.2 million poisoning exposures of which 475,079 were managed in a health care facility. In 2008, 2,491,049 human exposure cases, presented by substance categories.

Most (82.8%) poison exposures were unintentional; suicidal intent was suspected in 8.7% of cases. Therapeutic errors accounted for 10.6% of exposures (263,942 cases), with unintentional misuse comprising 4.3% of exposures. Of these 90% of cases used 1 substance and 6.2% used 2 substances.

By gender, the distribution was 1,213,110 male; 1,264,405 female and 13,534 unknown. By age, for the 40-49 cohort: 59,204 (41.55%) male; 83177 (58.38%) female; and 292 fatalities, 133 male and 159 female. For the 50-59 cohort: 43,551 (39.51%) male; 66,629 (60.44%) female; and 250 fatalities, 132 male, 118 female.

Sedative and hypnotics accounted for 6.6% of exposures and analgesics for 13.3%. Sedatives caused 14.81% and opioids 12.72% of fatalities. Majority (72.6%) of human exposures were managed on site (non-health care facility), 11.9% were treated/released; 3.7% were admitted to ICU, and 2.2% were admitted to a hospital. The medical outcome of human exposure cases by patient age 20 years and older were: no effect 13.1%; minor effect 11.3%; moderate effect 3.1%; major effect 0.3%; and death 0.1%. Minor effect events had duration of less than 2 hours 37%; between 2 and 8 hours 26.8%; 8 to 24 hours 18.5%; 24 hours to 3 days 5.1%. Moderate effect durations were 6.2; 21.8; 32.9 and 18.3 percents for the same duration groups. Major effect durations were 2.8, 6.5; 25.6 and 31% for the same groups. (Bronstein, 2009)

Twenty percent of events (13.3 + 6.6) are of interest for our condition. The estimated number of events for the age group 40-49 are 11841 male, 16635 female. Age 50-59 8710 male, and 13326 female. The estimated incidence rates, for the age cohort 40-49 are 0.0097 male (11,841/1,213,110) and 0.0132 female (16,635/1,264,405); for the age cohort 50-59, 0.0072 male and 0.0105 female.

Treatment and Outcomes

Based on the best evidence available best and worst case percentage ranges are assigned. The medical condition is divided into three clinical phases in all three clinical phases a functional impairment is assigned. The clinical phase I and II's functional impairments remain for the duration for that respective clinical phase. The function impairment in clinical phase III represents final impairment for this medical condition and remains for the rest of the mission. Other mission end states include evacuation and loss of crew life.

The IMM checks medical resource availability once the number of medical events and scenarios has been established. If there is not sufficient essential resources called out in the CliFF, then the medical condition will go down an untreated best or worst case scenario pathway.

The table below summarizes the treated and untreated best and worst case scenarios.

	Clinical Phase I Diagnosis & Initial Treatment[1]		**Clinical Phase II On-going Treatment / Convalescence[2]**		**Clinical Phase III Recovered / Mission End State[3]**		
	FI* (%)	**Duration (hrs)**	**FI* (%)**	**Duration (hrs) (Min - ML - Max)**	**FI* (%)**	**EVAC** (%)**	**LOCL** (%)**
ISS-based Treatment (best case scenario %: 99 - 100)	100	0.5	1 - 30	1 - 4.5 - 8	0	0	0
ISS-based Treatment (worst case scenario %: 0 - 1)	100	1	11 - 50	8 - 40 - 72	0 - 50	0 - 100	0 - 100
Untreated Best Case	0	0	11 - 50	1 - 4.5 - 8	0	0	0
Untreated Worst Case	0	0	31 - 100	8 - 40 - 72	31 - 100	0 - 100	0 - 100

[1]Clinical Phase I: Clinical phase I covers only the initial assessment of the affected crew member to define his or her medical condition, and completion of appropriate initial treatment to stabilize the crew member. While the affected crew member is being assessed, he or she is not able to perform any assigned tasks, thus Functional Impairment during this phase is considered 100%. In the untreated case, there is no diagnosis performed or treatment given, therefore Functional Impairment and Duration will always be "not applicable".

[2]Clinical Phase II: On-going Treatment and Convalescence- During clinical phase II, the affected crew member is receiving any appropriate follow-on treatment for his or her medical condition to allow the crew member to recover as much as he or she is able to recover in the ISS environment. Clinical phase II also encompasses relapses or reoccurrences of the same original medical condition in clinical phase I necessitating additional treatment or recovery time due to unsuccessful primary treatment response. The duration in Clinical Phase II is expressed in minimum, most likely (ML) and maximum hours. This was updated for future capabilities in IMM but is currently not being used by the model.

[3]Clinical Phase III: Recovered/Mission End State- Clinical phase III is reached once the affected crew member has recovered from the medical condition as much as he or she is able to recover in the ISS environment. This may or may not be recovery from the given medical condition to the full extent possible. If this "recovered" state results in an evacuation or loss of the crew member, this will be noted in the mission end state results.

*Functional Impairment (FI) is a measure of the affected crew member's health and performance ability.

**Two mission end state results are addressed in the CliFF: 1) Evacuation (EVAC) - crew and patient are evacuated from the spacecraft due to the medical condition, and 2) Loss of crew (LOCL) - death of affected crew member due to medical condition. EVAC is considered as an end state result if any of the following criteria are met: 1) potential LOCL, 2) potential significant permanent impairment, or 3) potential intractable pain. Probability distributions are assigned for each range of values within the Table of Treatments and Outcomes.

Refer to the Integrated Medical Model Technical Document for more information on how risk is reported by the IMM, Crew Health Index (CHI) and Quality Adjusted Mission Time calculations.

Definition and Probability of Best and Worst Case Scenario: (includes definitions of best and worst case scenarios and identifies the probability of those scenarios.)

Scenario Comments

Best case is defined as a sedative or opioid medication overdose that resolves within 8 hours and does not require treatment.

Worst case is defined as a sedative or opioid medication overdose that requires more than 8 hours to resolve and/or requires treatment.

Best case versus worst case probabilities percentages were determined using terrestrial data from the National Poison Data System (NPDS). (Bronstein, 2009) Of the population 20 years and older, 1.9 had a major effect and 0.2 died. Older age groups had a greater incidence of severe outcomes. Of the total population, 0.8% had a major effect and 0.1 % died. Our estimate of worst case is 0-1%. Thus the best case estimate is 99-100%.

Best Case Comments

The functional impairments (FI) calculation for Medication Overdose follows the IMM severe non-space adaptation template, with the exception of untreated best case during Clinical Phase III; by definition this type of event finishes by the end of Clinical Phase II; hence the FI is class 0. Consciousness and awareness ratings are based on Table 13-4, p. 327 (American Medical Association, 2008).

By definition in Clinical Phase I, FI is 100%. Duration of physical exam as described in ISS checklist for the best case scenario is estimated as 30 minutes. During Clinical Phase II, FI is estimated at 1 to 30%. Duration is estimated in 1 to 8 hours, In Clinical Phase III, full recovery is expected and FI is 0%. By definition EVAC and LOCL are not expected for the best case scenario.

Worst Case Comments

The functional impairments (FI) calculation for Medication Overdose follows the IMM severe non-space adaptation template, with the exception of untreated best case during Clinical Phase III; by definition this type of event finishes by the end of Clinical Phase II; hence the FI is class 0. Consciousness and awareness ratings are based on Table 13-4, p. 327 (American Medical Association, 2008).

By definition in Clinical Phase I, FI is 100%. Duration of physical exam and medication as described in ISS checklist is estimated as 60 minutes. During Clinical Phase II, FI is estimated at 11 to 50%. Duration is estimated at 8 to 72 hours. In Clinical Phase III, full recovery may or may not occur and FI is estimated at 0-50%. EVAC has occurred in analog populations in 23.8% of cases (Goodman, 2011). Overdose hospitalization and fatalities have occurred terrestrially at 2.2-3.9 and less than 1% respectively. (Bronstein, 2009) To allow for uncertainty we estimate the risk of EVAC and LOCL to be 0-100%.

Untreated Best Case Comments

The functional impairments (FI) calculation for Medication Overdose follows the IMM severe non-space adaptation template, with the exception of untreated best case during Clinical Phase III; by definition this type of event finishes by the end of Clinical Phase II; hence the FI is class 0. Consciousness and awareness ratings are based on Table 13-4, p. 327 (American Medical Association, 2008).

During Clinical Phase II, FI is estimated at 11 to 50%. Duration is 1 to 8 hours, similar to the treated best case scenario. In Clinical Phase III, by definition recovery occurs without treatment. FI is estimated at 0%. EVAC and LOCL are not expected for this condition.

Untreated Worst Case Comments

The functional impairments (FI) calculation for Medication Overdose follows the IMM severe non-space adaptation template, with the exception of untreated best case during Clinical Phase III; by definition this type of event finishes by the end of Clinical Phase II; hence the FI is class 0. Consciousness and awareness ratings are based on Table 13-4, p. 327 (American Medical Association, 2008).

During Clinical Phase II, FI is estimated at 36 to 75%. Duration is estimated to be 24-72 hours, similar to the treated worst case scenario. In Clinical Phase III, recovery is unlikely and FI is estimated at 31-100%. To allow for uncertainty we estimate the risk of EVAC and LOCL to be 0-100%.

Treatment and Options Level of Evidence (LOE)

The IMM level of evidence appropriate assessment of the quality of the IMM input data. Since IMM incorporates input data from a wide variety of sources including astronaut population, terrestrial or analog populations, and external models, an innovative approach to assess the quality of input data was required. Information obtained from the astronaut population and/or space flight is the more relevant so it is assigned the highest level of evidence and less relevant data sources are assigned a lower level of evidence.

Citation	LOE Value	LOE Category
Bronstein, 2009	4	EVAC
	4	BCWC
American Medical Association, 2008	3	FI
Goodman, 2011	2	EVAC

The Resource Table (RT)

Resource	Units Required Best Case	Units Required Worst Case	Units Available At Start Of Mission	Consumable	Essential	Rationale
Ambu bag and mask	0	1	1	No	Yes	Hand-held device used to provide positive pressure ventilation to a patient who is not breathing or is breathing inadequately
Blood Oximeter	1	1	1	No	Yes	Monitors the oxygen saturation of a patient's blood
Blood Pressure Cuff (regular, large)	1	1	2	No	Yes	Measure blood pressure
Blood Pressure Monitor	1	1	1	No	Yes	Measure blood pressure
BZK wipes	0	3	60	Yes	No	Cleanse skin.
CMRS	0	1	1	No	No	Restrain crew member to ensure safety
ECG Monitor (Device, USB Charge Cable, Lead Set Cable, Cue Card)	0	1	1	No	Yes	Measure and monitor ECG
Endotracheal Stylet	0	1	1	No	Yes	To provide endotracheal ventilation and protect the airway
Endotracheal Tube 7.0/8.0	0	1	4	Yes	Yes	Establish and maintain patent airway and ventilation.
EtCO2 Monitor with EMMA adapter	0	1	1	No	Yes	Measure end tidal CO2
Flumazenil (Romazicon) 0.1mg/mL, 10 mL	0	1	1	Yes	Yes	To reverse benzodiazepine sedation
Gauze pads (4x4)	0	1	50	Yes	No	To absorb blood or fluids from skin
IV administration set	0	1	3	Yes	Yes	IV fluid administration
IV Cap	0	1	5	Yes	No	To connect end of IV tubing to Y-catheter
IV Catheter (18G, 20G, or 22G)	0	1	14	Yes	Yes	IV fluid administration
IV Fluid 1L (1000mL)	0	1	5	Yes	Yes	Fluid replacement
IV Fluid Air Filter	0	1	3	Yes	No	To filter air from IV line
IV pressure infuser	0	1	1	No	No	IV fluid administration in reduced gravity
Ketamine 50 mg/mL, 10 mL multi dose vial	0	0.3	6	Yes	Yes	For sedation in case of intubation/ventilation.
King Supraglottic Airway (SGA) Tube (size 3/size 4)	0	1	2	Yes	Yes	Establish and maintain patent airway and ventilation.
Laryngoscope (blade)	0	1	1	No	Yes	For intubation
Laryngoscope handle	0	1	1	No	Yes	For intubation
Medical tape	0	0.03	5	Yes	No	Single-coated tape pressure adhesive tape

Resource	Units Required Best Case	Units Required Worst Case	Units Available At Start Of Mission	Consumable	Essential	Rationale
Naloxone (Narcan) 1mg/mL, 2mL	0	2	2	Yes	Yes	To reverse opiod sedation
Nasal Airway (6mm, 7mm)	0	1	2	No	Yes	Airway management
Needle (23G)	0	3	20	Yes	Yes	For medication administration.
Nitrile gloves (large, medium, and small) (pair)	0	1	30	Yes	No	Personal Protective equipment for CMO
Oral Airway	0	1	2	No	Yes	Airway management
Pack of 12 ECG electrodes	0	1	5	Yes	Yes	Measure and monitor ECG
PEEP Valve	0	1	1	No	Yes	Provides positive airway pressure during ventilation
SGA Cue Card	0	1	1	No	Yes	Guidance for use of supraglottic airway
Sharps container	0	1	40	No	No	To dispose of medical waste such as used medical needles, scalpels, IV catheters, razors, vials
Stethoscope	1	1	2	No	Yes	Audible evaluation of lungs
Suction Cartridge	0	1	1	No	Yes	Provide airway suctioning
Suction device	0	1	1	No	Yes	To remove secretions or vomit
Suction device collection bag	0	1	2	Yes	No	To collect fluids suctioned from mouth/airway
Suction device syringe	0	1	1	No	Yes	To remove fluids, secretions, vomit from mouth
Suction tip - mouth (curette)	0	1	1	No	Yes	Used for suction by inserting into the end of a suction tube
Suction Tubing - Endotracheal Tube	0	1	1	Yes	Yes	For clearing endotracheal tube of secretions
Surgical Lubricant	0	1	6	Yes	No	To lubricate bottom of ILMA mask, roof of the mouth, ET Tube
Syringe (35cc)	0	1	1	Yes	Yes	Inflation of SGA tube
Syringe (3cc)	0	3	20	Yes	Yes	For medication administration.
T-adapter	0	1	1	No	Yes	Connection for ventilation tubing
Tourniquet	0	1	1	No	No	To stop blood flow and engorge vein facilitating IV insertion
Valium (Diazepam) 5 mg/mL, 2 mL syringe	0	1	2	Yes	Yes	For sedation with intubation
Variable Oxygen System	0	1	1	No	Yes	To provide oxygenation during ventilation
VOS Intubated Patient Hardware (Ventilator/Respirator)	0	1	1	No	Yes	Mechanical ventillation

Resource Comments

The table was revised on 9/1/2011. We added: BP, endotracheal tube, oxygen tubing, mask, Y catheter, Luer lock cannula, lubricant, ILMA card, 10 cc syringe, and ILMA stabilizing rod.

The ISS medical checklist (Mission Operations Directorate (MOD), 2011) includes procedure for Sleep Medication Overdose. Opioid overdose is not addressed in the ISS medical checklist. We are including treatment with opioid antagonist based on clinical guidelines. (National Collaborating Centre for Mental Health (UK), 2004) All resources are available on board.

Comparison of clinical guidelines versus ISS Medical Checklist

Clinical Guidelines recommend medication antagonists, monitor for respiratory failure or respiratory depression and provide respiratory support as needed similar to the ISS medical checklist. (National Collaborating Centre for Mental Health (UK), 2004)

Required Resources Level of Evidence (LOE)

The IMM level of evidence appropriate assessment of the quality of the IMM input data. Since IMM incorporates input data from a wide variety of sources including astronaut population, terrestrial or analog populations, and external models, an innovative approach to assess the quality of input data was required. Information obtained from the astronaut population and/or space flight is the more relevant so it is assigned the highest level of evidence and less relevant data sources are assigned a lower level of evidence.

Citation	LOE Value	LOE Category
NASA Mission Operations Directorate (MOD), 2011	2	Resources
National Collaborating Centre for Mental Health (UK), 2004	3	Resources

Level Of Evidence

Input Data	LOE Average
Incidence	1.5
Functional Impairment	3
Best Case / Worst Case	4
EVAC / LOCL	3
Resources	2.5
QUALITY OF EVIDENCE	**2.8**

Description	Range
Excellent	1-2
Good	2.1-3
Fair	3.1-4
Poor	4.1-5

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