Recovery and introduction process: employ antiseptics and surgical scrubs prior to grooming and grooming for tissue recovery and ascent processes. Procedures can vary from company-to-company. Recently, WHO has reviewed the antibacterial effects of alcohol, Polvaryl Pyrimidinil Iodine (PVP-I), and other topical antiseptics with respect to spectrum and speed of activity against bacteria but the report included only limited information on against viruses. WHO notes wide variation in hand washing techniques worldwide as to choice of agent, dose, and contact time. We know of no single study comparing these factors as to antibacterial and antiviral speed of kill. Accordingly, since tissue bank workers are vigilant in maintaining aseptic techniques, we thought it important to provide current laboratory data so as to assist in the ranking of the various techniques and reagents that are available. Contact times of 15 and 60 seconds were studied as examples of kill time ranges reported by WHO and as examples of kill times at Gibraltar Laboratories in studies conducted for various antiseptic manufacturers according to FDA and ASTM methods.

Methods

Methods for the kill time experiments and procedures were based on ASTM E-2135 and ASTM E-1052 for bacteria and viruses respectively.

ANTISEPTICS: (PVP-I) 10% Ethanol 62% w/w [EtOH], Iodosoipan 62% w/w [IPA], Triclosan 0.15% [TRICLOSAN] and Benzethonium (GAC) chloride[BC] 0.15%. TWEEN-80, and Isopropanol 62% w/w [IPA]. For the viruses 20% fetal bovine serum (FBS) and diblo were the neutralization entities for viral recovery recorded as dilutions beyond the toxic doses.

CHALLENGE MICROORGANISMS: (Bacteria, Yeast, and Viruses) Suspension kill time assays were performed selected from the list of bacteria required by FDA for topical antiseptics, with ATCC designations: Staphylococcus aureus 6538, MRSA 33591, Esherichia coli 11229, Salmonella typhi 6359, Pseudomonas aeruginosa 15442, Proteus mirabilis 43071, Klebsiella pneumoniae 4352, Streptococcus pyogenes 19615, Staphylococcus epidermidis 14906, Acinetobacter baumannii 19068, Enterococcus faecalis (VRE) 21519, yeast, Candida albicans and the viruses: Influenza A Hong Kong 8/96, Herpes simplex virus type 1, Adenovirus type 2, Rhinovirus type 42, Poliovirus type 1, Hepatitis A virus (HAV) and the Filovirna Calicivirus (FVC), surrogate for the Norwalk virus.

We point out that Triclosan and other liquid-type soaps are not labeled as to rapid percent kill. Directions are not labeled as to rapid percent kill. Standardization for these practices is not available but is a goal.

Summary

Bacteria

• EIDOH, IPA, Benzethonium Chloride and PVP-I were equally effective against all of the bacteria and yeast tested producing a broad spectrum score of 12/12(100%) at contact time of 15 seconds.

• Triclosan liquid soap was the least effective antibacterial producing a narrow spectrum score of 3/12(25%) at a contact time of 15 seconds. Slight effects were seen at 60 seconds.

Virus

• EIDOH, IPA, Benzethonium Chloride were equally effective against the enveloped viruses Herpes and influenza but were inactive against non-enveloped virus Adeno, Rhino, Pto, FCV, and HAV producing a narrow spectrum score of 2/7-28%.

• Triclosan liquid soap was the least effective antiviral producing a narrow spectrum score of 1/7(14%)

The failure of all the antiseptics to inactivate the non-enveloped virus in these short-term experiments is noted and it is pointed out that longer contact times for PVP-I and the alcohol may produce a different result.

General

• EIDOH and IPA were equally active in this study and were the most effective agents for hand hygiene in agreement with the WHO review, as regards efficacy and safety (reported elsewhere).

• When analyzed from both the experimental and regulatory points of view the aliphatic alcohols and their surfactants were found to be effective against all bacteria tested with exception of aerobic Gram Negative bacteria (e.g. Pseudomonas aeruginosa) and MRSA. These results are in agreement with published scientific literature.

Table 1: Antibacterial kill times – 15 and 60 seconds

Table 2: Antiviral kill times – 15 and 60 seconds

Table 3: FDA guidance on antiseptics and de-garging

Table 4: Dose-Time Relations