Eyelid and Anterior Eye Infection CLIFF Peer Review

1. *Strength of evidence presented in CLIFF in modeling the characteristics and mission impact of this medical condition within the spaceflight environment?*

   Score: 3

   Grading Scale:

   4 - Confident

   3 - Somewhat confident

   2 – Neutral

   1 – Somewhat unconfident

   0 – Not confident

2. How confident are you that these data accurately represent the spaceflight environment?	*Tables 1, 2* *Composite Incidence and Level of Confidence*	*Table 3, 4 BC/WC* *Loss of Crew and probability*	*Table 4 - Clinical Phase 1, 2 durations* *Table 5 – CP 2 Loss of Crew*	*Table 4 – RTDC %* *Table 6 – RTDC Loss of Crew*	*Table 4 – Loss of Crew Life %* *Table 7 – Loss of Crew Life, Loss of Crew*	*Table 8 – TI*
Score	*3*	*3*	*2*	*2*	*3*	*3*

Comments and limitations:

1. **General comments.** This CLIFF includes infections in the eyelids and anterior structures of the eye (iris, anterior chamber, cornea, conjunctiva, sclera, and anterior uveal tract). It does not include inflammatory conditions of these structures. It can be problematic to determine whether the pathologic cause of styes or blepharitis is caused by obstruction, inflammation, or true infection. Spaceflight data indicates that there have been 12 episodes that could represent infection as defined by this CLIFF. The etiology of some of these cases is not well-defined, but they are included in the composite incidence.

2. **Incidence.** Given the unique spaceflight environment and the healthy astronaut population, spaceflight data was used exclusively for the composite incidence. Terrestrial data was incorporated in the calculation of other parameters. There exists some uncertainty in the spaceflight reporting whether the cases represent true infection, inflammation, or obstruction. Some of the in-flight events are not well described. There may be significant under-reporting of mild infections, as the condition is often self-limited. As in many CLIFFs, there is a paucity of data to calculate untreated worst case. However, the best case/worst case probability used spaceflight data which was

appropriate. The clinical phase durations, RTDC and Loss of crew life probabilities are supported by terrestrial evidence. It is felt that even untreated worst case scenarios would not result in Loss of crew life. The probability density curve that was derived appears to be a reasonable representation of the data presented and demonstrates appropriate uncertainty.

3. **Clinical phase data**. I am in agreement with the clinical phase 1 duration entered in this CLIFF. This data was compiled by a team of expert clinicians, and I was involved in the discussions leading to the calculation of the clinical phase 1 duration. CP2 duration was based on terrestrial data.

4. **Task impairment**. The analysis was performed and reviewed by a separate team of expert clinicians. I am aware of the methods that were used but did not directly participate in the discussions.

5. **Dependence on mission phase or duration of mission**. This medical condition should not be dependent on mission phase.

6. **Limitations**

- Literature regarding the untreated worst-case scenario was extremely limited and several parameters are based on subject matter expert opinion.
- Spaceflight data represents the best evidence for composite incidence; however, there is some uncertainty about whether reports were accurate in differentiating between infection, inflammation, and obstruction.
- The worst-case definition was not explicitly defined to one type of pathology, allowing for a wide range of uncertainty.
- There is some possible overlap with other ocular CLIFF definitions.
- There could be under-reporting of past spaceflight cases as many episodes may have been mild and self-limited.
- Viral conjunctivitis can be very contagious, so once an episode occurs, the incidence of further cases will likely increase significantly.

Reviewed by:

David C. Hilmers