2026 SOT Annual Meeting & ToxExpo
Session: Medical Devices II
Abstract/Poster #: 3747/B179
Tuesday, March 24, 2026
9:15 AM – 11:45 AM

GRADIENT

Comparative Review of Carcinogenicity Testing Guidelines in Context of Medical Device Risk Assessment

Rachel Y. Chang, Ph.D.; Manoochehr Khazaee, Ph.D.; Julie E. Goodman, Ph.D., DABT, FACE, ATS

Background and Purpose: ISO 10993-3 recommends carcinogenicity studies aligned with OECD 451 guidelines, and combined chronic toxicity/carcinogenicity studies aligned with OECD 453. However, if there is sufficient toxicity data, ISO 10993-3 recommends a risk assessment using these data rather than conducting additional carcinogenicity tests. It is common to consider studies conducted under different testing guidelines in the same chemical risk assessment; thus, it is important to understand similarities and differences in requirements of other frequently followed testing guidelines, such as US Environmental Protection Agency (US EPA) TG 870.4300, US EPA TG 870.4200, GB/T 15670.28-2017, and GB/T 15670.27-2017. We compare study design requirements in US EPA and Chinese national standard (GB/T) guidelines to Organisation for Economic Co-operation and Development (OECD) requirements to determine whether these studies could be considered in a risk assessment that complies with ISO 10993-3.

Methods: We reviewed and compared carcinogenicity testing guidelines in OECD 451, US EPA TG 870.4200, and GB/T 15670.27-2017, and did the same for combined chronic toxicity/carcinogenicity study guidelines in OECD 453, US EPA TG 870.4300, and GB/T 15670.28-2017. We focused on key study parameters, including the preferred animal model, study size, exposure and observation duration, dose selection, and the endpoints evaluated. We also considered rubrics regarding how study results are evaluated and confounding factors are controlled, acceptance criteria for negative findings, requirements for dose-dependent responses, and criteria for early study termination due to elevated mortality.

Results: In general, testing guidelines by OECD, US EPA, and GB/T are similar with respect to requirements for study size, exposure duration, dose selection, and the handling of test and control animals . A few noteworthy differences include:

1) US EPA requires carcinogenicity testing in at least two rodent species to better identify species-specific responses, while OECD and GB/T recommend only one species.
2) OECD 451 and 453 and US EPA TG 870.4200 and 870.4300 recommend comparing neoplastic findings in the study with historical controls from the same strain of animal kept in the same laboratory facility.
3) Both US EPA and GB/T require the dose-response relationship to be included when evaluating a toxicity response; OECD only requires a statistical summary of the findings.
4) Both US EPA and GB/T include a maximum percentage mortality: ≤10% loss per group due to autolysis, cannibalism, and management, and ≥50% survival at 15 months for mice and 18 months for rats. This is to avoid the study being confounded by an elevated mortality rate.

Conclusions: There are a large number of similarities with respect to key study design parameters and how results should be evaluated in the OECD, US EPA, and GB/T guidelines. This indicates that risk

assessments based on studies conducted following any of these study guidelines should be similarly robust and acceptable for an OECD carcinogenicity evaluation.