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The Impact of eSTAR on Data Requirements

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What is eSTAR?

- Interactive pdf template for 510(k)s and de novos downloadable from
  - https://www.fda.gov/medical-devices/how-study-and-market-your-device/estar-program#:~:text=eSTAR%20is%20an%20interactive%20PDF,necessary%20details%20for%20the%20submission.
  - Mandatory for all 510(k)s as of Oct. 1, 2023 for all types of 510(k)s: Traditional, Special, Abbreviated.
  - Combination of checkboxes, mandatory text, and free text
- Submitted electronically to FDA via the CDRH portal
  - Also allows real-time tracking of submissions
  - Max file size is 4 GB in total, no attachment larger than 1 GB
- Does not change 510(k) timelines, but no RTA review of eSTAR as cannot submit unless all administrative information is present

eSTAR versions and RAI

- eSTAR is updated regularly
  - There are minor and major version updates. Major updates typically involve new data requirements.
  - Ensure you are using the current version of eSTAR! An older version cannot be used for submission after it has been obsoleted.
  - The current eSTAR version is V5.1.
- eSTAR is also used to submit your response to an FDA's AINN deficiency letter ("RAI response").
  - The original 510(k) submission is updated with additional info provided as a "response".
  - Not clear how to manage multiple rounds of RAI responses

Advantages of eSTAR (per FDA)

- Guides the submitter to ensure they provide the necessary details for the submission.
- Complements the reviewers' internal Submission Memo And Review Template (SMART) used to review the submission (the questions correlate), so the reviewer is getting what is expected.
- Provides a standardized format to make information accessible for the reviewer and submitter.
- Automates many aspects of the submission to ensure the content is present, eliminating the need for a Refuse to Accept (RTA) review by the reviewer and RTA holds. The FDA does not intend to conduct an RTA review for an eSTAR submission.
- Auto fills entered information to avoid entering the same information twice.
- Includes built-in databases to ensure the information relevant for device specific guidances, classification identification, and standards information are auto filled accurately.
- Includes built-in forms (Truth & Accuracy statement, Form 3514, 510(k) Summary, Declaration of Conformity, and the Indications for Use Form 3881).
- Collects submission data in a structured format to help automate many aspects of FDA processing.
- Serves as a comprehensive resource to consolidate the necessary information and links needed for submission preparation.

Downsides of eSTAR

- pdf documents not amenable to review and editing
  - Forced HL to create cumbersome Word documents versions of the eSTAR
- Based on your device description, eSTAR will "decide" what type of supporting info is required for your device. It may disagree with the company's assessment. eSTAR's assessment is often more stringent.
- New requirements are universally implemented across FDA practice groups
- Standardized sections in document forces "expert" level of review for sections that often received cursory level of review
  - Biocompatibility
  - Software
  - Cybersecurity
  - EMC
  - Wireless Coexistence

Example 1: Biocompatibility

- In eSTAR, you will be asked to detail for every device component: type of material, contact type, and contact duration.
- The type of tissue contact and duration of contact will determine the types of Biocompatibility endpoints that you will be required to supply.

Medical device categorization by			Biological effect											
Nature of Body Contact		Contact Duration **A – limited** (≤24 h) **B – prolonged** (>24 h to 30 d) **C – permanent** (> 30 d)	Cytotoxicity	Sensitization	Irritation or Intracutaneous Reactivity	Acute Systemic Toxicity	Material-Mediated Pyrogenicity	Subacute/Subchronic Toxicity	Genotoxicity	Implantation	Hemocompatibility	Chronic Toxicity	Carcinogenicity	Reproductive/Developmental Toxicity#
Category	**Contact**													
Surface device	Intact skin	A	X	X	X									
		B	X	X	X									
		C	X	X	X									
	Mucosal membrane	A	X	X	X									
		B	X	X	X	O	O	O		O				
		C	X	X	X	O	O	X	X	O		O		
	Breached or compromised surface	A	X	X	X	O	O							
		B	X	X	X	O	O	O		O				
		C	X	X	X	O	O	X	X	O		O	O	
External communicating device	Blood path, indirect	A	X	X	X	X	O				X			
		B	X	X	X	X	O	O			X			
		C	X	X	O	X	O	X	X	O	X	O	O	
	Tissue⁺/bone/ dentin	A	X	X	X	O	O							
		B	X	X	X	X	O	X	X	X				
		C	X	X	X	X	O	X	X	X		O	O	
	Circulating blood	A	X	X	X	X	O		O^		X			
		B	X	X	X	X	O	X	X	X	X			
		C	X	X	X	X	O	X	X	X	X	O	O	
Implant device	Tissue⁺/bone	A	X	X	X	O	O							
		B	X	X	X	X	O	X	X	X				
		C	X	X	X	X	O	X	X	X		O	O	
	Blood	A	X	X	X	X	O		O	X	X			
		B	X	X	X	X	O	X	X	X	X			
		C	X	X	X	X	O	X	X	X	X	O	O	

Example 1: Biocompatibility (cont'd)

- Based on your input, you may be prompted to enter info for each of the following tests (or provide justification for absence of data).
- Data provided on a material-by-material basis
  - Material name, use of color additives
- Rather than simply providing the test report, specific information must be pulled out of the report for each test about the methods and results.
  - Control used
  - Extraction conditions and handling or modification of the extract
  - Methodology used
  - ASCA accreditation of lab
    - https://www.fda.gov/medical-devices/division-standards-and-conformity-assessment/asca-accredited-testing-laboratories

Example 2: Software

- eSTAR follows the relevant recent FDA guidance documents for Software and Cybersecurity Validation (Content of Premarket Submissions for Device Software Functions (fda.gov); Cybersecurity in Medical Devices: Quality System Considerations and Content of Premarket Submissions (fda.gov)).

- eSTAR will ask you if your device has firmware or software and will prompt you to attach supporting documents for:
  - ✓ **Software Documentation Level Evaluation**
  - ✓ Software / Firmware Description
  - ✓ Risk Management File (including Hazard Analysis)
  - ✓ Software Requirements Specifications (SRS)
  - ✓ System and Software Architecture Design (SAD) Chart
  - ✓ Software Design Specifications (SDS)
  - ✓ **Software Life Cycle Process Description / Software Development, Configuration**
  - ✓ **Management, and Maintenance Practices**
  - ✓ Software Testing as Part of Verification & Validation
  - ✓ Software Version / Revision Level History
  - ✓ Unresolved Software Anomalies

Example 3: Cybersecurity

- eSTAR will ask you if your device has:
  - Cloud Communication
  - Network connection (active or not)
  - Wireless communication in any form
  - USB/serial ports/removable media
  - Software upgrades (this includes patches)
  - None of the above

- Yes to any of the above means there is some level of cybersecurity mitigation needed
  - Can affect legacy devices even when there has been no software change

Example 3: Cybersecurity (cont'd)

- "Based on the answers provided in the Device Description section, cybersecurity information is needed."
  - ✓ Cybersecurity Risk Management Report;
  - ✓ Threat Model;
  - ✓ Cybersecurity Risk Assessment;
  - ✓ Software Bill of Materials (SBOM);
    - ✓ Software level of support and end date of support for each software component;
  - ✓ Safety and security assessment of cybersecurity vulnerabilities;
  - ✓ Unresolved Anomalies for Cybersecurity;
  - ✓ Cybersecurity Metrics;
  - ✓ Cybersecurity Controls;
  - ✓ Architecture Views;
  - ✓ Cybersecurity Testing;
  - ✓ Cybersecurity Management Plan.

Cybersecurity Risk Management Process

- Establish, document, and maintain throughout the medical device lifecycle an ongoing process for
  - identifying hazards associated with the cybersecurity of a medical device,
  - estimating and evaluating the associated risks,
  - controlling these risks, and
  - monitoring the effectiveness of the controls.

  This process should include risk analysis, risk evaluation, risk control, and incorporation of production and post-production information.
- Focus on assessing the risk of patient harm by considering:
  - The exploitability of the cybersecurity vulnerability, and
  - The severity of patient harm if the vulnerability were to be exploited.

SOPs to Update:

- Design – Inputs to Transfer
- Risk Management
- Software Verification and Validation
- Complaint Handling and MDR
- Submissions
- Device Change Control(s)
- Audit
- CAPA
- Risk Assessment- Health Hazard Assessments
- Corrections and Removals
- Supplier Controls
- Servicing

Cybersecurity Labeling

- FDA expects specific cybersecurity information included in the device instructions
  - Instructions on how to maintain the device cybersecurity and how to update the software for the device. This should include how to maintain or update any off-the-shelf software components.
  - Instructions for any security actions that the user or user facility are expected to take/implement to ensure secure use of the device.
  - Inform users of any Amazon Web Services (AWS) dependencies and provide instructions for users if the dependencies are unavailable.
  - Include a description of cybersecurity events that can be detected by the device and a description of how users will be informed of such events.
  - Include instructions for what a user should do if a cybersecurity event is detected or suspected (i.e., incident response plan).

Example 4: EMC and Wireless Coexistence

- If your device has electrical components (mains or battery powered), eSTAR will prompt you input info about Electrical Safety and EMC testing (IEC 60601):

- EMC testing per IEC 60601-1-2:
  - Definition of “Essential Performance” of your device; Pass/fail criteria specific to the device;
  - Other questions about the testing methodology

- Wireless Technology information per AAMI TIR69 and Coexistence per ANSI C63.27
  - Functional Wireless Performance
  - Level of risk
  - Type of wireless communication and QoS
  - RF Wireless Labeling

Example 4: EMC (cont'd)

- eSTAR will prompt you to refer to the specific location in your test reports which addresses all relevant endpoints, such as:
  - CISPR 11 emission limits
  - IEC 61000-4-2 electrostatic discharge (ESD) immunity results
  - IEC 61000-4-3 radiated RF electromagnetic field immunity results
  - IEC 60601-1-2 Sec 8.10 and Table 9 Proximity field immunity test levels and test results
  - IEC 61000-4-8 power frequency magnetic field immunity test levels
  - IEC 61000-4-6 conducted disturbances induced by RF fields immunity test levels and test results
  - IEC 61000-4-4 …
  - Etc.

Example 5: Guidance Documents

- If a device-specific FDA guidance document exists for this device type, eSTAR will prompt you to relate to it, e.g.:
  - ***"In the text box below, provide information demonstrating compliance with applicable special controls, regulation, or adherence to device specific guidance recommendations for the Performance Testing.***
    For each specific special control, regulation, or guidance recommendation applicable to your device: Please list the special control, regulation, or recommendation and cite the attachment(s) and page number(s) where it was addressed."

Conclusion

- eSTAR is the new required format for 510(k) submissions.

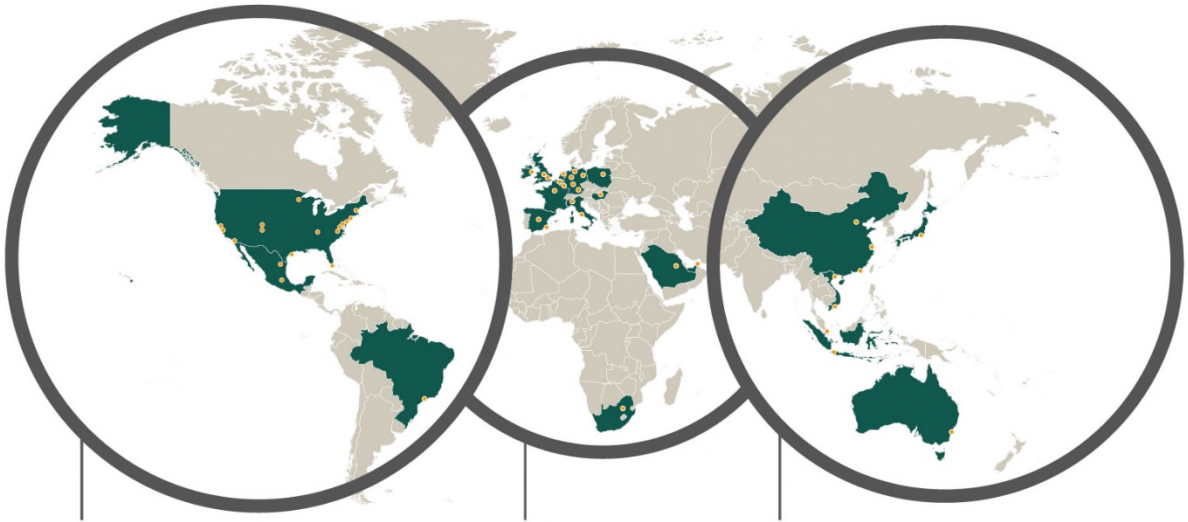
- Upsides
  - No more RTA!
  - Makes reviewer's life easier (probably)
  - New guidance is consistently and instantly implemented

- Downsides:
  - Pdf format not amenable to drafting/reviewing process
  - "Expert level" of review for horizontal standards/guidance documents
  - Can't just attach test reports and let FDA determine if adequate
  - New guidance is consistently and instantly implemented

- Bottom Line – eSTAR is not going anywhere. Industry and FDA will need to adapt.

Map usage

Our global presence



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