#	Ten Simple Rules	Definition	Outreach Capability Conformance Level	Outreach to Application-domain experts that may not Comprehensive	Outreach to M&S practitioners that may not be Application-Extensive	Outreach to Application-domain specific M&S practitioners Adequate	Outreach to Application-domain specific M&S practitioners Partial	None/Too little Insufficient
			General explanation of levels	*Can be understood by non-M&S practitioners familiar with the application domain and the intended context of use*	*Can be understood by M&S practitioners not familiar with the application domain and the intended context of use*	*Can be understood by M&S practitioners familiar with the application domain and the intended context of use*	*Unclear to M&S practitioners familiar with the application domain and the intended context of use*	*Missing or grossly incomplete information to properly evaluate the conformance with the rule*
1	**Define context clearly**	Develop and document the subject, application, purpose, and intended use(s) of the model or simulation		Summary is understandable by M&S practitioners and application-domain experts; Detailed explanation is understandable	Summary is understandable by M&S practitioners and application-domain experts; Detailed explanation is understandable	Summary is understandable by M&S practitioners and application-domain experts; Detailed explanation is understandable by	Summary is not clear to application-domain experts and/or M&S practitioners; Missing details that hinder adequate	Application, purpose and context of use entirely unclear; Minimal/no details provided;
2	**Use appropriate data**	Employ relevant and traceable information in the development or operation of a model or simulation		All the data used in M&S development and/or operation is traceable to its original source; Application-domain experts that are not M&S practitioners can understand which and how the data was used;	All the data used in M&S development and/or operation is traceable to its original source; M&S practitioners not familiar with the application-domain can understand which and how the data was used;	All the data used in M&S development and/or operation is traceable to its original source; M&S practitioners familiar with the application-domain can fully understand which and how the data was used;	Part of the data used in M&S development and/or operation is traceable to its original source; M&S practitioners familiar with the application-domain can understand some aspects of how the data was used;	Little to none of the data used in M&S development and/or operation is traceable to its original source; Insufficient detail preventing M&S practitioners familiar with the application-domain to understand at least some aspects of how the data was used;
3	**Evaluate within context**	Verification, validation, uncertainty quantification, and sensitivity analysis of the model or simulation are accomplished with respect to the reality of interest and intended use(s) of the model or simulation		One or more of verification, validation, uncertainty quantification, and sensitivity analysis of the model or simulation are accomplished with respect to the reality of interest and intended use(s) of the model or simulation; Application-domain experts that are not M&S practitioners can understand the results;	One or more of verification, validation, uncertainty quantification, and sensitivity analysis of the model or simulation are accomplished with respect to the reality of interest and intended use(s) of the model or simulation; M&S practitioners not familiar with the application-domain can understand the methods and the results;	One or more of verification, validation, uncertainty quantification, and sensitivity analysis of the model or simulation are accomplished with respect to the reality of interest and intended use(s) of the model or simulation; M&S practitioners familiar with the application-domain can understand the methods and the results;	A subset of verification, validation, uncertainty quantification, and sensitivity analysis of the model or simulation are partly accomplished with respect to the reality of interest and intended use(s) of the model or simulation; M&S practitioners familiar with the application-domain can understand some of the methods and results;	Little to none of verification, validation, uncertainty quantification, and sensitivity analysis of the model or simulation are accomplished with respect to the reality of interest and intended use(s) of the model or simulation; Insufficient detail preventing M&S practitioners familiar with the application-domain to understand at least some of the methods and results;
4	**List limitations explicitly**	Restrictions, constraints, or qualifications for, or on the use of the model or simulation are available for consideration by the users or customers of a model or simulation		Limitations understandable by Application-domain experts that may not be M&S practitioners;	Limitations understandable by M&S practitioners that may not be familiar with the application-domain;	Limitations understandable by M&S practitioners that are familiar with the application-domain;	Some of the limitations understandable by M&S practitioners that are familiar with the application-domain;	Little to none of the limitations clear to M&S practitioners that are familiar with the application-domain;
5	**Use version control**	Implement a system to trace the time history of M&S activities including delineation of contributors' efforts		Extensive version control history available to an independent third party; Version history and contributions are understandable by application-domain experts that may not be M&S practitioners;	Extensive version control history available to an independent third party; Version history and contributions are understandable by M&S practitioners that may not be familiar with the application-domain;	Adequate version control history available to an independent third party; Version history and contributions are understandable by M&S practitioners that are familiar with the application-domain;	Inadequate portion of version control history available to an independent third party; Version history and contributions are partly understandable by M&S practitioners that are familiar with the application-domain;	Version control history is not available to an independent third party, or does not exist;
6	**Document appropriately**	Maintain up-to-date informative records of all M&S activities, including simulation code, model markup, scope and intended use of M&S activities, as well as users' and developers' guides		Extensive mark-up of the model and simulation code; Detailed user/developer guide, READMEs, or manuals; Understandable by application-domain experts that may not be M&S practitioners;	Extensive mark-up of the model and simulation code; Detailed user/developer guide, READMEs, or manuals; Understandable by M&S practitioners that are not familiar with the application-domain;	Adequate mark-up of the model and simulation code; Limited user/developer guide, READMEs, or manuals; Understandable by M&S practitioners that are familiar with the application-domain;	Partial/Limited mark-up of the model and simulation code; Non-existent user/developer guide, READMEs, or manuals; Partly understandable by M&S practitioners that are familiar with the application-domain;	No mark-up of the model and simulation code; Non-existent user/developer guide, READMEs, or manuals; Insufficient documentation preventing M&S practitioners that are familiar with the application-domain to understand at least some of the M&S activities;
7	**Disseminate broadly**	Share all components of M&S activities, including simulation software, models, simulation scenarios and results.		All components of M&S activities, including simulation software, models, simulation scenarios and results are published; Accessible by application-domain experts that may not be M&S practitioners (i.e., not restricted to a modeling community only resource);	All components of M&S activities, including simulation software, models, simulation scenarios and results are published; Accessible by M&S practitioners that are not familiar with the application-domain (i.e., not restricted to members of an application-domain specific society);	All components of M&S activities, including simulation software, models, simulation scenarios and results are published; Accessible by M&S practitioners that are familiar with the application-domain;	Some of the components of M&S activities, including simulation software, models, simulation scenarios and results are published; Partly accessible by M&S practitioners that are familiar with the application-domain;	Little to none of the components of M&S activities, including simulation software, models, simulation scenarios and results are published; Not accessible by M&S practitioners that are familiar with the application-domain;
8	**Get independent reviews**	Have the M&S activity reviewed by nonpartisan third-party users and developers		M&S activity reviewed by third party application-domain experts that may not be M&S practitioners;	M&S activity reviewed by third party M&S practitioners that may not be familiar with the application-domain;	M&S activity reviewed by third party M&S practitioners that are familiar with the application-domain;	M&S activity partly reviewed by third party M&S practitioners that are familiar with the application-domain;	M&S activity not reviewed by third party;
9	**Test competing implementations**	Use contrasting M&S execution strategies to check the conclusions of the different execution strategies against each other		At least two contrasting implementations are tested and compared; Implementations understandable by application-domain experts that may not be M&S practitioners	At least two contrasting implementations are tested and compared; Implementations understandable by M&S practitioners that may not be familiar with the application-domain;	At least two contrasting implementations are tested and compared; Implementations understandable by M&S practitioners that are familiar with the application-domain;	Two contrasting implementations are partly tested and compared; Implementations partly understandable by M&S practitioners that are familiar with the application-domain;	No contrasting implementations are tested and compared;
10	**Conform to standards**	Adopt and promote generally applicable and discipline specific operating procedures, guidelines, and regulations accepted as best practices		Follows best practices that are in use by application-domain experts that may not be M&S practitioners; Use of model formats and/or simulation tools popular in or relevant to an organ/disease specific research community;	Follows best practices that are in use by M&S practitioners that may not be familiar with the application-domain; Use of model formats and/or simulation tools generally popular in M&S communities;	Follows best practices that are in use by M&S practitioners that are familiar with the application-domain; Use of model formats and/or simulation tools popular in or relevant to an organ/disease specific research community, or more generally in M&S communities;	Folows a few of the M&S practices that are in use by M&S practitioners that are familiar with the application-domain; Partial use of model formats and/or simulation tools popular in or relevant to an organ/disease specific research community;	Does not follow the M&S practices that are in use by M&S practitioners that are familiar with the application-domain;