**Supplemental Materials**

**Appendix A: All Early Predictors**

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| Early Predictors |
| Any scientific review – does this protocol require any scientific review (yes/no) |
| Principal Investigator - Requested Application Type - specific protocol Principal Investigator - Requested Application Type based on subject of study from database submission by study team (initial review, exempt; initial review, convened; initial review, non-exempt medical record review; National Cancer Institute Central IRB facilitated review; protocol development activities without immediate plans for involvement of human subjects) |
| Cancer related – cancer related (yes/no) |
| Clinical and Translational Research Core submission – (yes/no) |
| Conducting organization - the institute research arm from which the study originated (e.g., VA, University of Wisconsin, University of Wisconsin Hospital and Clinics) |
| Federally funded – (yes/no) |
| ICTR grant – Institute for Clinical and Translational Research Grant (yes/no) |
| ICTR scientific review – does this protocol require scientific review from the Institute for Clinical and Translational Research (yes/no) |
| Industry funded – (yes/no) |
| Investigator initiated – is this protocol investigator initiated |
| IRB name – name of IRB conducting review |
| IRB of record – is the UW IRB the IRB of record (yes/no) |
| IRB staff – IRB member in charge of this protocol’s review |
| IRB-Determined Review Type – the type of review that will be conducted (e.g., convened review, expedited review) |
| Is VA –is this study to be conducted at the Veterans’ Administration (yes/no) |
| Month received – the month the IRB received the protocol to begin review |
| Multi-site – is this protocol planned to be conducted at multiple sites (yes/no) |
| Point of contact – is the principal investigator the point of contact (yes/no) |
| Privately funded – (yes/no) |
| Renewal – is this protocol a renewal of a previously approved protocol (yes/no) |
| Review type – type of review to be conducted (e.g., exempt, expedited, facilitated, convened) |
| UW-coordinated – for multisite studies, will UW serve as the overseeing site (yes/no) |
| Vulnerable children – does this protocol include children (defined as a vulnerable group per the Code of Federal Regulations) (yes/no) |
| Vulnerable groups – does this protocol include any vulnerable groups (e.g., children, persons developmentally delayed) (yes-no) |
| Vulnerable impaired – does this protocol include vulnerable groups with developmental impairments (yes/no) |
| Department of Study Origin – name of department submitting the protocol (e.g., pediatrics, nephrology) – 124 departments evaluated as one variable with 124 possible values and separately as 124 binary variables. No Department of Study Origin was significant once correction applied for multiple testing using Bonferonni method. |

**Appendix B: Late Predictors**

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| **Late Predictors (Most Informative in Models)** |
| **Issues –** does this study have questions or problems that need to be addressed prior to IRB approval |
| **Number of Days in Triage –** number of days protocol is in triage stage of review |
| **IRB Court Administrative Time** – subprocess time in which IRBCourt reviews study |
| **Study Team Court Admininistrative Time** – subprocess time in which the study team (Stm) confirms administration issues are completed |
| **Number of Administrative Trips** – number of times protocol goes to Administration from principal investigator (PI) |
| **Pre-review Ancillary Time** – time spent in ancillary IRB for pre-review |
| **IRB Court Pre-review** – IRB prereview time in which any remaining issues or questions are clarified with the principal investigator (PI) prior to convened IRB review |
| **Non-Study Team Pre-review** – non-study team prereview time is composite time of IRB court prereview +prereview ancillary time + time for scientific review after review begins |
| **Study Team Court Pre-review** – study team prereview time |
| **Number of Pre-review trips** – number of trips to prereview team from PI |

**Appendix C. Significant ANOVA Evaluations In Pooled Analysis**

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| ANOVA Evaluation Variables with Significant Differences |
| Principal Investigator - Requested Application Type – type of IRB application (e.g., initial review, exempt) [NOTE: The UW electronic IRB system allows study teams to select different types of IRB applications that request varying information depending on the type of research study] |
| Conducting Organization – identifies whether the UW or an affiliated organization (Madison VA or UW Health) is conducting the study |
| IRB-Determined Review Type – the type of review that will be conducted (e.g., initial convened review, initial expedited review, change protocol expedited review) |
| IRB Staff – the IRB staff member in charge of this protocol’s review |
| Month Received – the month the IRB received the protocol to begin review (NOTE: only 2011-2012 data showed significance with ANOVA testing) |
| Review Type – the review type that is conducted (e.g., exempt, expedited, or convened) |

**Appendix D. Glossary of Machine Learning Terms**

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| Glossary of Machine Learning Terms |
| **Algorithm** – a set of instructions to solve a problem or carry out a procedure |
| **Class Variable** – the target feature to be predicted in machine learning algorithms |
| **Feature** – a characteristic of an object |
| **Discretize** – to divide a continuous variable into discrete intervals |
| **Information gain** - a measure of the value of a proposed data split (on a feature value) based on how much more consistent class labels for objects in the subset are after the proposed data split is performed. |
| **Machine Learning** – a branch of computer science that studies and develops methods for computers to learn (rules) from raw data |