

This example was created to help explain what CPHS committee members are looking for when they review this section of your proposal.

In this section, the Committee would like to know what you intend to learn from this study (“**Specific Aims**”); what data you plan to collect (“**Primary Outcomes**”); what your expectations are about what this data might reveal (i.e. “**Hypotheses**”) and what sort of analytic plan you propose to attempt to corroborate your expectations.

*We are keenly focused on “connecting” the four components of Primary Outcome, Specific Aims, Hypotheses, and Statistics so that we can see that there you have developed a **clear path to knowledge**. The CPHS needs to understand this link because the knowledge you gain is what balances the risks that research participants are exposed to. Without a clear path to knowledge, no risk is worthy.*

To keep things simple, we recommend that you select one or two PRIMARY outcomes (dependant variables) that will be excellent representations of the effect that you wish to measure, describe, or compare. While you may collect other data to help augment your understanding, hypothesis driven research (including engineering research) is best described with only one or two outcomes that are most relevant.

Your Specific Aims should focus on the main goal (“specific”) or goals that you hope to achieve. We recommend 1-3 Specific Aims. You are not limited to collecting ONLY the data necessary for your Specific Aims; most researchers/engineers collect additional secondary data to help augment their primary findings.

Hypotheses statements should have a clear link to the Specific Aims. Numbering both sections accordingly sometimes helps to establish the link. Each Aim should have at least one hypothesis, and hypotheses statements should be written with the statistical plan in mind, so that whatever data analysis you propose will easily answer your hypotheses.

Similarly, your statistical planning should directly address each hypothesis. Statistical analyses can be quite varied, from simple plots, to tabular descriptions of the data, or to applications of complex inferential methods. Do not feel obligated to “go overboard” on the statistical plan, but clearly present your plan for how the data will be used to address each hypothesis.

In the example here, try to appreciate the links among all four of these sections.

Primary Outcomes:

Our dependant variables include measurements of subjects’ joint angles, and distance from joints to a central reference point located on the hip. Collectively we call these measurements anthropomorphic profiles.

Specific aims:

Determine if neutral body posture measurements can be acquired in the Neutral Buoyancy Laboratory (NBL).

Assess the relative accuracy of these measurements for various types of subjects.

Hypotheses:

1. Anthropomorphic profiles of Neutral Body Posture can be established in the NBL using methods proposed in this application.
2. Subject characteristics such as gender, BMI, height are related to how reliably primary outcomes can be measured.

Statistics

Hypothesis #1 is a logistics hypothesis that requires no inferential statistics. Evidence in support of this hypothesis will include successful data acquisition of outcomes described above for each subject.

Hypothesis #2 will be addressed by comparing intraclass correlation coefficients (ICCs) of primary outcome measures by gender (M/F), BMI (low, medium, high) and height (short, medium, tall) groups. Groups for BMI and height will be determined by percentiles (33% , 67%) in the normal subject population.