



**2022 NSCA TACTICAL ANNUAL TRAINING** #NSCATactical22

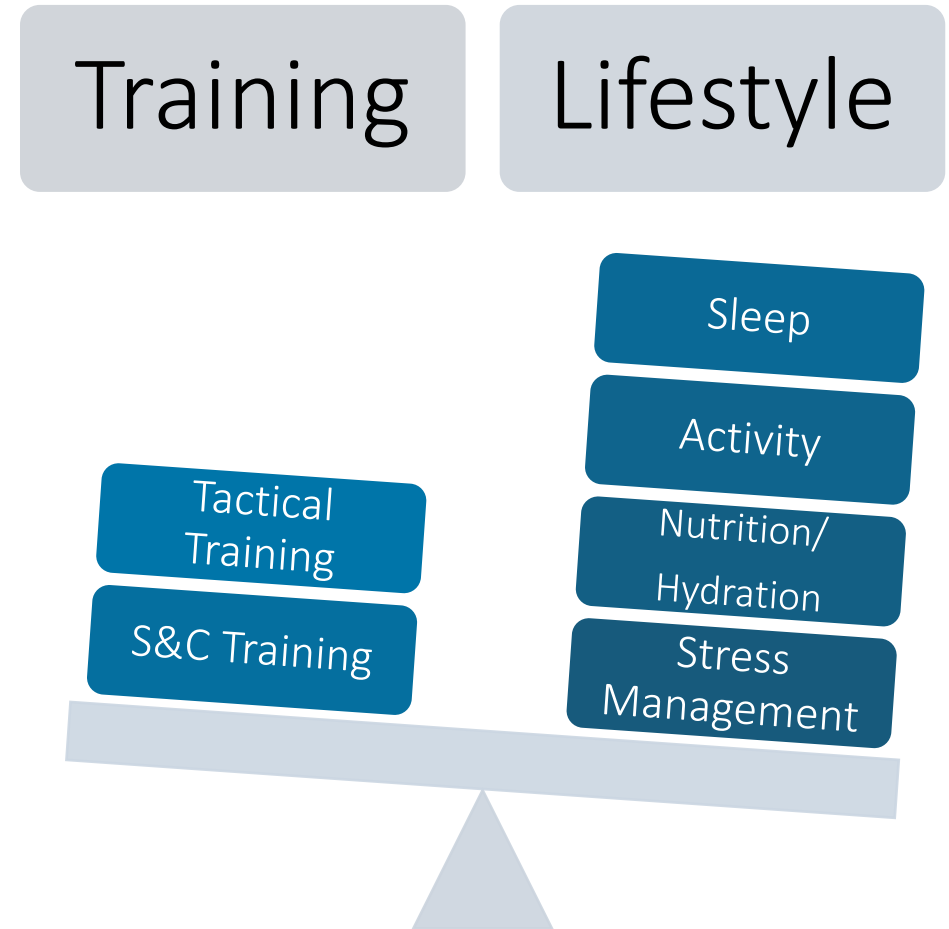
## ***CONFLICT OF INTEREST STATEMENT:***

I have no actual or potential conflict of interest in relation to this presentation.

# Purpose

Leverage your Highly Qualified Subject Matter Experts in order to:

1. Critically examine your human performance program
2. Identify the most important workload variables for YOUR context
3. Zero in on the underlying physiological relationships of concern
4. Structure an actionable, logic- and evidence-informed tracking, monitoring, and reporting program
5. Mitigate time and financial dead-space within your system by minimizing footprint and maximizing purpose



# Workload Defined

A measure of work prescribed or completed in training to assess physiological demands on the individual and/or cohort.

- **Acute** - single workout/session
- **Chronic** - weeks, month, “seasons”
- **Acute to Chronic Work Ratio (ACWR)**; large variations in *acute* workload compared to *chronic* may necessitate greater attention to “Internal” workload variables (below)

## Categories of Workload Measurement

- **External** – Prescribed work; sets \* reps \* weights/velocity/time written down before and/or after training [Prescription].
- **Mechanical** – Physical measure of work; does not directly indicate physiological reaction to stress [Completion/Adherence].
- **Internal** – Direct physiological impact measure of External/Mechanical stressors. Acute measures can inform session training scheme (auto-regulation) or be basis for relative external prescription (e.g., HR-based). Chronic measures elucidate individual/group ability to tolerate and adapt to training [Trends].

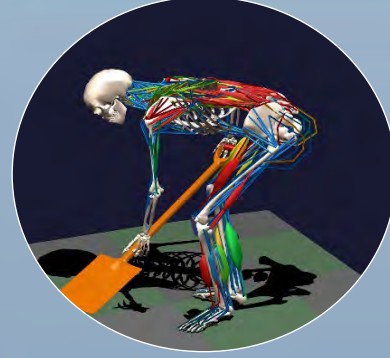
# Examples

## Operational Definitions Used in Specific Context



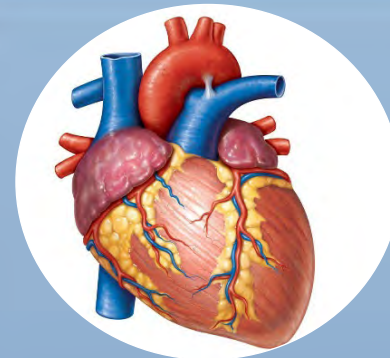
### External

- Sets
- Reps
- Weight
- Duration
- Rx Mileage/Speed/Times
- Frequency



### Mechanical

- Speed/Velocity
- Power Output (Force\*Velocity)
- Acceleration
- GPS Measures
- Jump Height/Landing Force or Time
- Accelerometry (steps, etc.)



### Internal

- RPE
- TRIMP/TE
- Blood Analyses
- Heart Rate (Max HR, HRV, etc.)
- Psych Inventories, Sleep
- Oxygen Uptake (VO<sub>2</sub>)

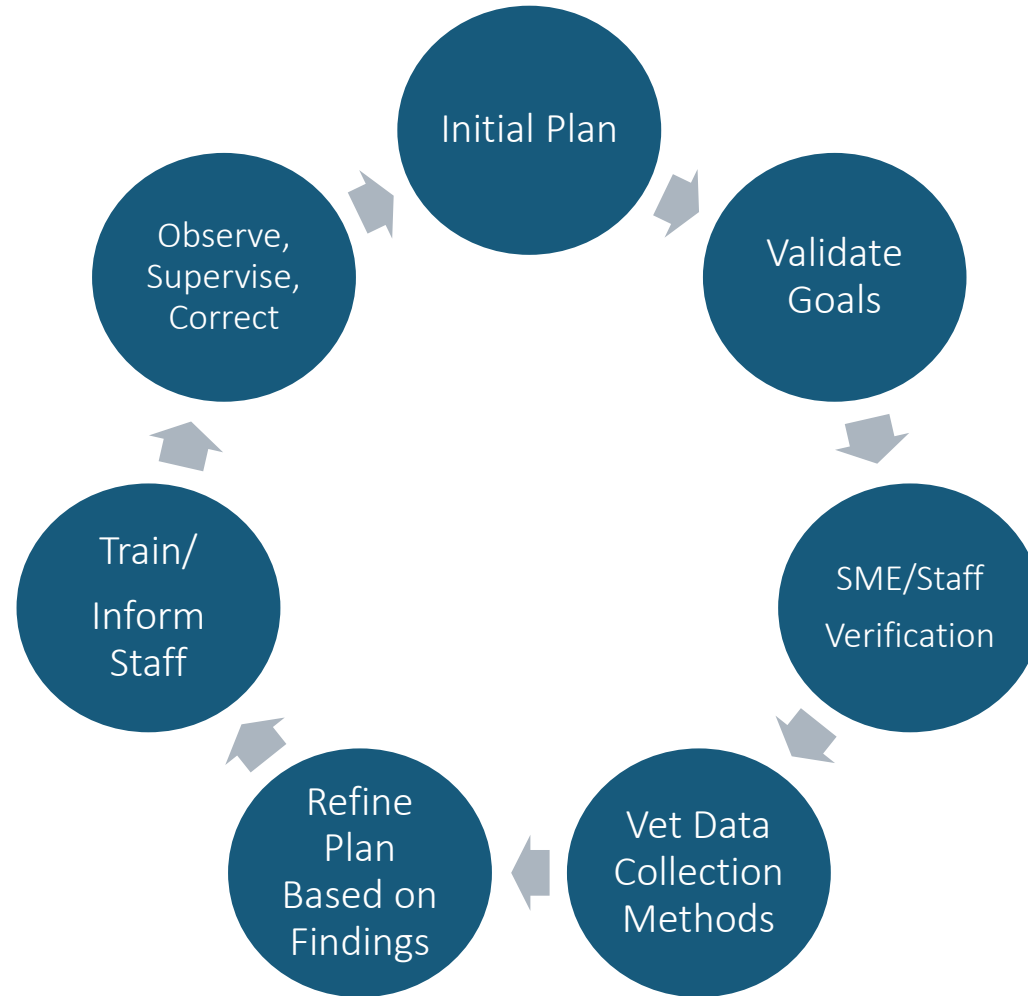
*Data aggregation; analyses of External, Mechanical, and Internal against each other to indicate stress “load” and tolerance*

Data are utilized to inform interventions and directed discussions between trainee and practitioner(s). Human interpretation is context dependent and should mirror organizational intentions over time.

# Integration

***“It is vain to do with more what  
can be done with less”***

- William of Occam



# ***“First in Necessity, Second in Capability”***

- 1. Layout the Tentative Plan as a Team:** Outcome Goals, Major Sources of Deficiency, Priorities of Work, Staffing (Numbers and Capabilities), Schedule(s), Evidence-Based/Led/Informed and Producible Outcomes.
- 2. Identifying/Validating Process Measures of Success:** Physiological Variables, Exercise Technique Competencies, Performance Outcomes (Program Tracking and/or Testing), Determine Key Touchpoints, Determine Valid Observation and Reporting Intervals.
- 3. Double Down with SME’s:** Validate Cohesive Measurement, Quantification, and Reporting of Common Elements from #1 and #2 to Decision Makers.
- 4. Examine Role of Data Collection:** Technology ***Could*** Further Support Organizational Understanding or Influence of Measures of Success; *How Will it be Stored/Aggregated/Evaluated? Can it be Automated?*
- 5. Refine Plan:** Priorities of Work, Determinations of Valuable Evidence, Staffing, Schedules, and Ability to Collect & Disseminate Actionable Information.
- 6. Train/Inform Staff of Plan:** Unity of Effort/Command, Common Pitfalls, Eliminate Guess Work – *not everyone is a teacher!*
- 7. Supervise Implementation:** Refine SOP’s, Laterally/Vertically Advise on Best Practice, Be Willing to Flex Once Methods are Tested.

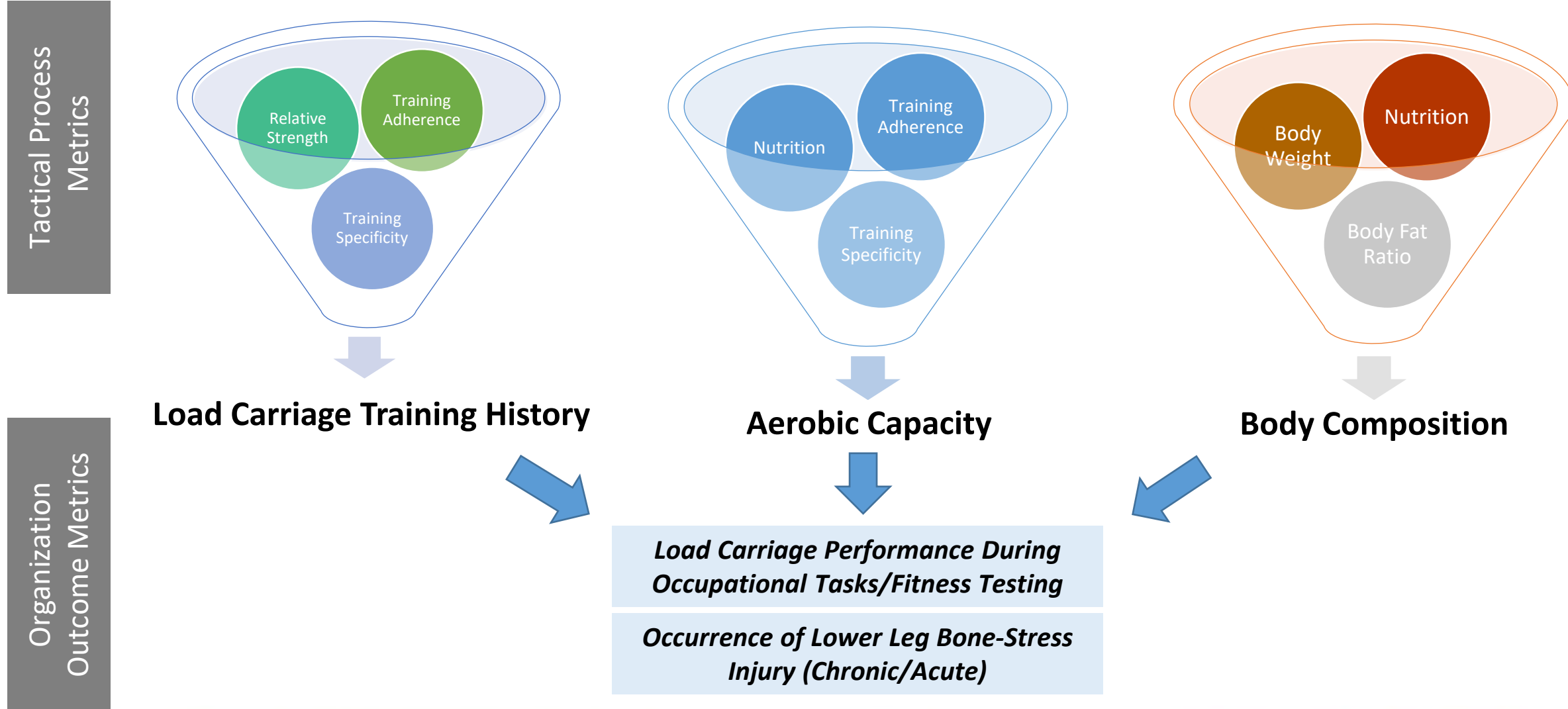
# Desired Outcomes

## Example:

### USAF Special Warfare (SW) Load Carriage Performance Tasks

1. Complete 3-mile Tactical Ruck w/60lb additional load in at least 42-minutes and 50-seconds (*Apprentice Course Exit Fitness Test*)
2. Be able to:
  - a. Maintain personal protective equipment (PPE) with an approximate weight of 45lbs
  - b. Move with rucksack at weight of 65lbs, donning an additional 60lb parachute apparatus within an aircraft with PPE and rucksack (~110lbs)
  - c. Traverse overland  $\geq 15$ mi w/assigned PPE and rucksack
  - d. Maneuver 2- to 8-ft barriers with PPE and rucksack
  - e. Moving 220 to 280lb casualty a minimum of 20m, and
  - f. Individually operate a  $\geq 35$ lb rescue-breaching device, wearing PPE and rucksack

# Drivers of Outcome



# Staff Validation of Methods/Tools

	<i>Low</i>	<i>Medium</i>	<i>High</i>
<i>Technical Validity</i>	Does not measure what it says it measures	Measures what it says it measures in general context	Measures what it says it measures in similar context of our application
<i>Technical Reliability</i>	Does not measure/report consistent values of purported measure	Measures/reports consistent values of purported variables in general context	Measures/reports consistent values of purported variables in similar context of our application
<i>Operational Utility</i>	Does not fit our mission	Fits our mission, may need to evaluate use/context of interpretation	Fits our application exceptionally well; use and context of interpretation are high

# Technical Validity/Reliability

*Fidelity of Measurement* – Does it measure what it says it measures? How specifically?

*Quantity/Quality Received* – How large is the operational data set?

*Quantity/Quality Retained* – Are important values missing or skewed (proprietary vs raw)?

*Quantity/Quality Delivered* – Is it manageable? Should it be filtered (by whom and when)?

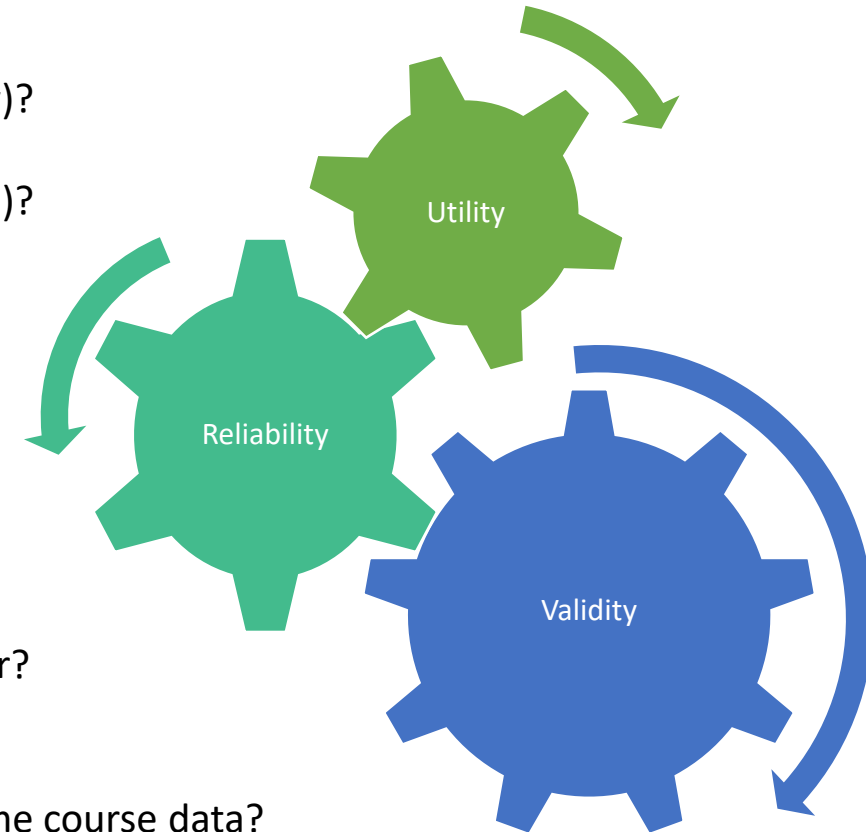
## Example:

### *USAF SW Wearable Heart Rate Strap*

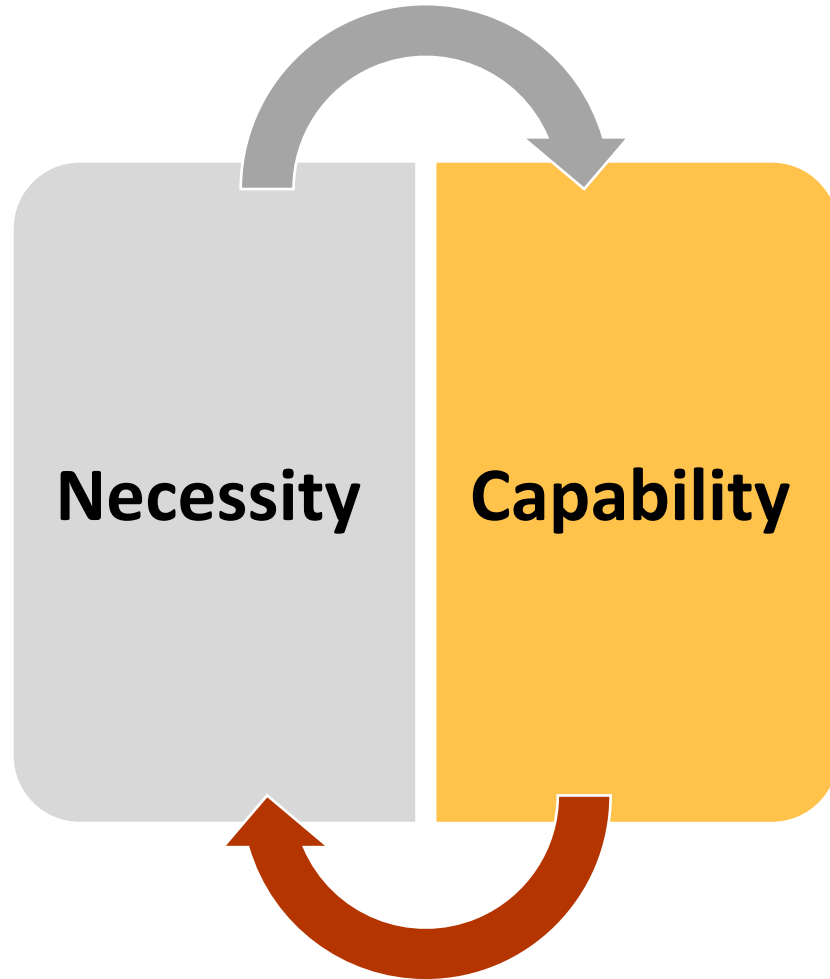
*Fidelity* – Does it provide accurate, real-time HR in a team display format to inform relative training intensity and candidate safety? Ruck/run?

*Quality/Quantity Received/Retained* – Does our application/environment create or compound any known source of error in storage? Type and rate of known error?

*Quantity Delivered* – Does the unit have internal recording capability (overland travel) in addition to team display? Do we have ability to examine post-hoc time course data?



# Operational Utility



*Quality Delivered* – Does the information provide **ACTIONABLE** results? Do you have the staff to interpret and implement needed data transformation to drive change/maintenance?

*Organizational Reach* – Who has access? Who **NEEDS** access? Should the information be formatted differently for different end users?

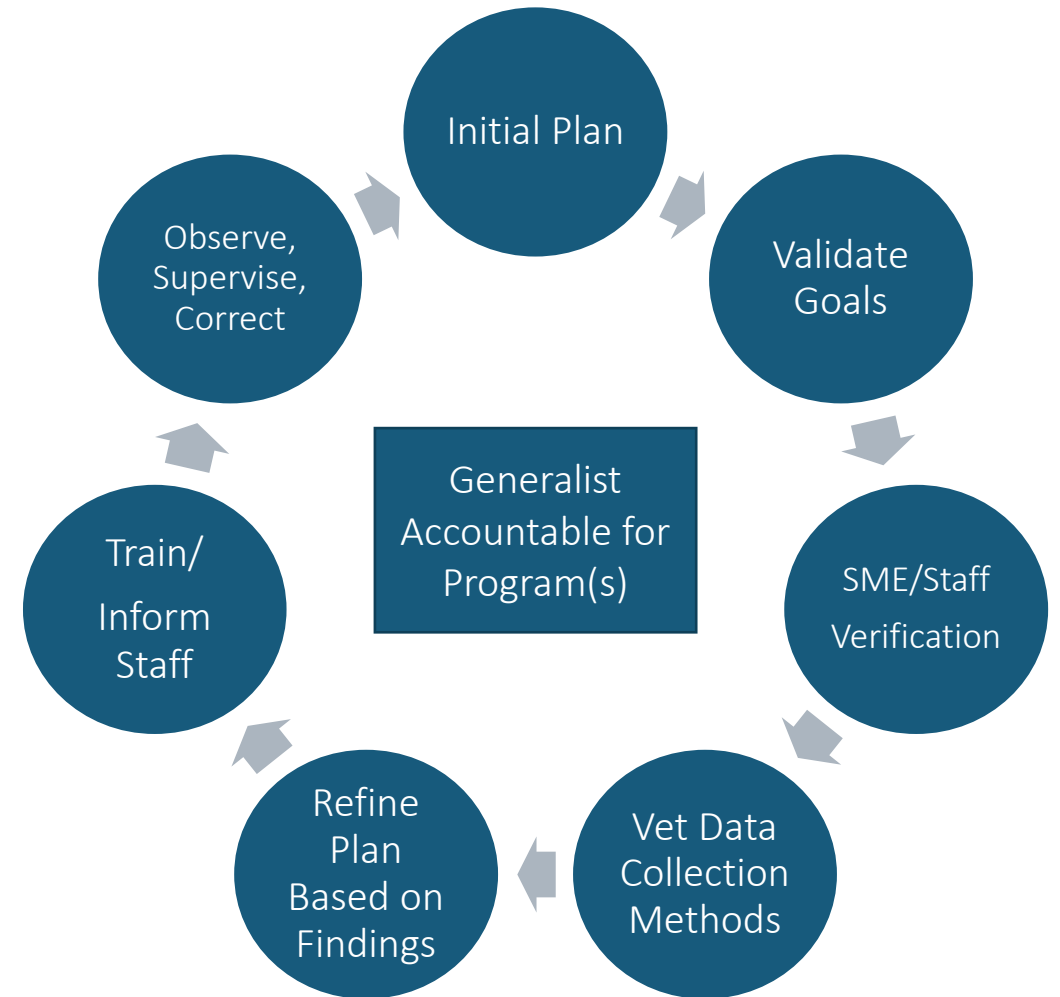
# The Subject Matter Expert(s)

**Fidelity of Measurement** – Do they have experience with this tool or others in THIS context? Do they have data collection experience to practically minimize “noise” (error) across multiple concurrent collections?

**Quantity Received/Retained** – Have they interpreted this data or have an understanding of the physiological/practical relationships?

**Quantity/Quality Delivered** – Can they aggregate the data into usable form (message) within mission context(s) and share it across the organization?

**Organizational Reach** – Do they speak the language of the organization? Do they share experiences with the gatekeepers of the organization? Can they teach or just operate?



*How can you, the organizational leader, facilitate these qualities in your existing staffers?*

# ***Training and Quality Check(s)***

1. Explicitly identify Priorities of Work (as informed by SME needs analyses); have “collection” and “monitoring” standards explained in writing. *What is the purpose of this tool, this collection method, and this reporting interval?*
2. Annotate “chain of command” and documentation for equipment failure, change of plans (human vs. nature), and what “valuable” information is for back-end analyses. *Who is accountable for this process?*
3. Thoughtfully provide known sources of error of tech/tools to operators and allow mitigation to occur in real time within defined limits to achieve desired context. *You may have been wrong initially.*
4. Conduct real-world observations and adjust fire based on contextual and environmental feedback. *Remain flexible; Rigidity = Weakness.*

# Summary

1. Money tends to appear and disappear before you have a plan. A culture of critical examination will expedite those processes.
2. Empower your organization to exist in problem solving, not task-execution. Understanding the physiological and contextual basis of your training interventions unravels the tech conundrum.
3. No “Off the Shelf” product will likely meet all your needs. Having a well-developed plan will shift power to your organization to gain “proof of concept” from vendors, not defend from their sales tactics.
4. Flexibility is easier with a minimized and robust plan.
5. If it does not drive change, it is likely not worth measuring. If you don’t understand it, it is DEFINITELY not worth measuring.

# Questions?

## Thank You:

- Lt Col Ben Hando, USAF SW HPS
- Maj Cody Butler, USAF SW HPS
- USAF SW Human Performance Squadron,
  - Research Flight,
  - Training Group, and
  - Training Wing