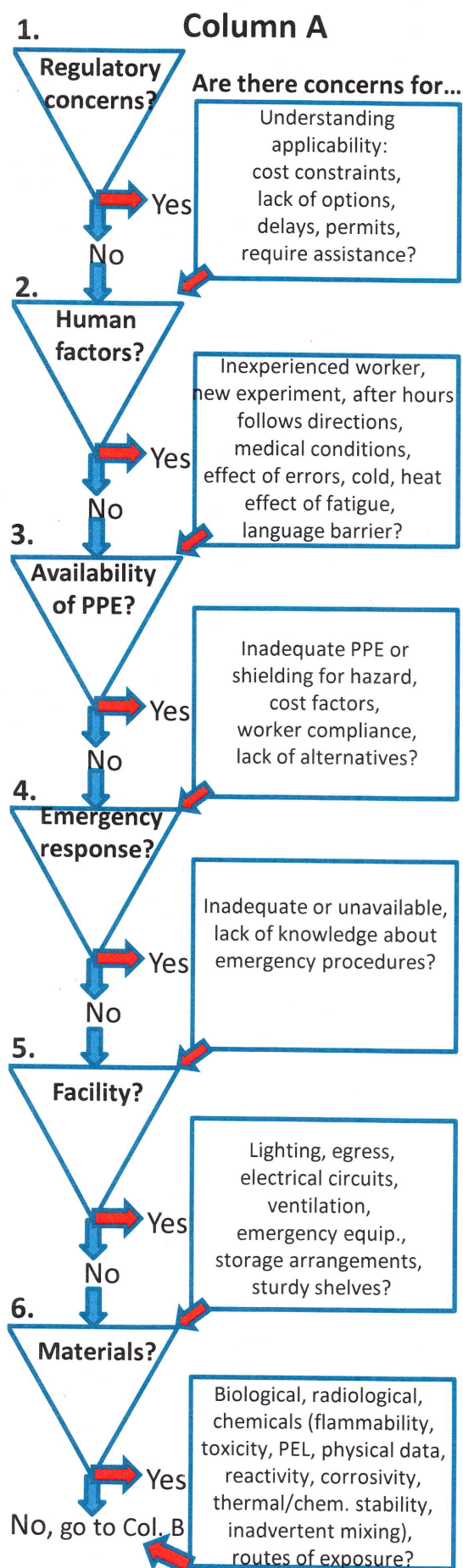


Developing an SOP by evaluating each of twelve potentially hazardous areas or conditions*

- A. First, consider these questions:
1. Specific issues identified?
 2. Risk Assessment -What is most likely to go wrong – what are the most severe consequences even if unlikely?
 3. Has there been sufficient literature search and consultation with experienced supervisors for lessons learned?
 4. Will standard precautions be adequate?
- B. Then, prepare strategies to eliminate, control or mitigate hazard, (for each twelve potentially hazardous area or condition):
1. **Regulatory concerns?** OSHA carcinogen regulations, EPA labeling, controlled substances DEA regulations, permits for select agents and/or radioactive materials, etc.
 2. **Human factors?** Reiterative training, enforce lab rules, supervision, ascertaining worker knowledge, ensure worker is well-informed, practice small, SOP's, buddy system
 3. **Availability of PPE?** Design experiment to reduce reliance on PPE, combine control methods, prohibit use of inadequate PPE
 4. **Emergency response?** Buddy system, alarms, ensure availability of equipment & personnel, emergency drills & training, spill kits, AED
 5. **Facility?** Ensure proper environment and conditions - **can use checklist**
 6. **Materials?** Eliminate, substitute or reduce amt.? Detection & warning methods? Use of administrative, engineering or PPE controls (expand)
 7. **Equipment and labware?** Integrity check, right tool for job, maintenance, correct use, troubleshoot, normal and emergency operations delineated
 8. **Process?** Change process, small tests, test runs without hazard present, acquire expert assistance, secondary controls, emergency response actions
 9. **Effects of change? & 10. Additive effects?** Assume and prepare for increased risks, identify these in order of potential, require review by experts, require continuous monitoring, install safeguards, warning systems, shut-down mechanisms and remote monitoring
 11. **Waste management?** Must be resolved before experiment, proper disposal containment and methods for experiment waste
 12. **Other high risks – potential failure points or routine activities?** Review and change work practices, extensive training, instructions to address unexpected - failures, breakage

* Adapted from guidelines developed by the Hazards Identification and Evaluation Task Force of the American Chemical Society's Committee on Chemical Safety, *Identifying and Evaluating Hazards in Research Laboratories*, Table 12-1a Structured Development of SOPs. <http://cenm.ag/hazard>

Identifying and Evaluating Hazards in Research Laboratories (<http://cenm.ag/hazard>)



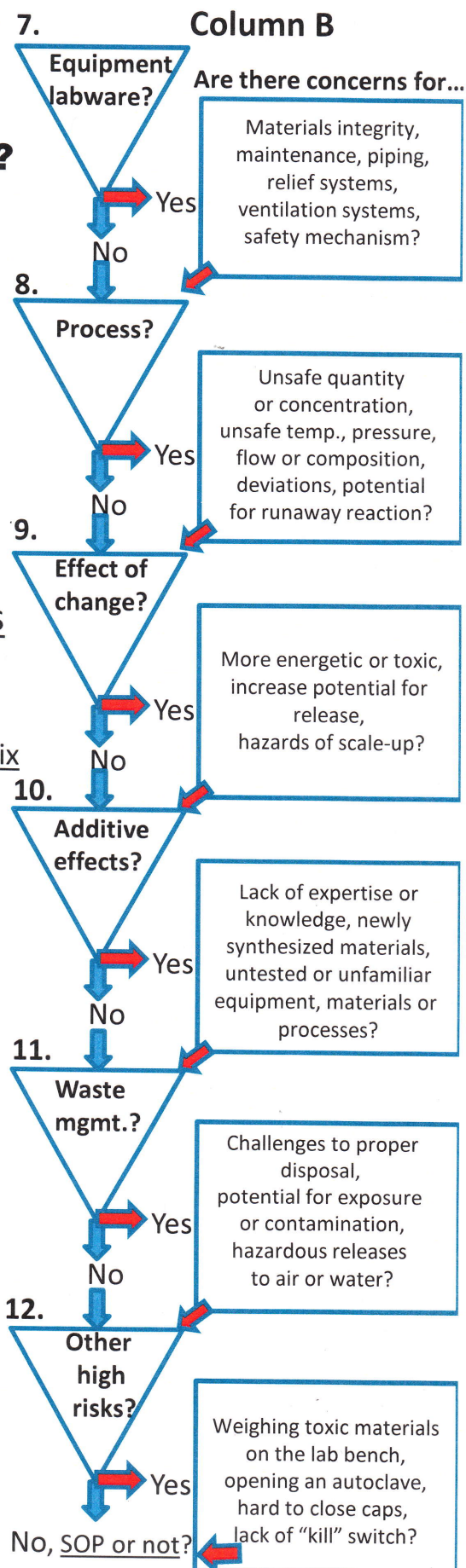
SOP or no SOP?

PRIORITY SOPs

If you answered
YES
To more than six
potential hazards...

ADDITIONAL SOPs

If you answered
YES
To any one and up to six
potential hazards...



Identifying and Evaluating Hazards
in Research Laboratories
Adapted from Table 12-1a
Structured Development of SOPs
by WMB, January 2015