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Beyond the checklist: recognising potential procedural standards drift as an educational governance challenge

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Introduction

Procedural skills teaching asks learners to reproduce sequences reliably, and checklists make expectations visible. Yet the content of a checklist is not self-renewing. Clinical evidence, professional guidance, equipment, institutional policy, learning materials, faculty demonstrations and assessment rubrics may be revised on different cycles. Consequently, a change accepted in clinical guidance may remain absent from teaching or continue to be contradicted by assessment.

This challenge has been approached from several directions. Curriculum mapping makes relationships among outcomes, teaching and assessment visible, while recent consensus work emphasises reviewing assessment whenever the curriculum changes.[1,2] Knowledge-to-action models address implementation of evidence, formal guideline-adaptation methods support contextual decisions, and continuous quality improvement frames curricula as systems that require repeated review.[3-5] These approaches establish the need for alignment and renewal. We propose a narrower diagnostic lens for the micro-level content of procedural teaching: potential procedural standards drift.

We use this term to describe a suspected, consequential and undocumented misalignment among the instructions or expectations attached to the same procedural step across current evidence or guidance, local learning materials, faculty teaching and assessment. The term is not presented as a validated construct or a replacement for curriculum alignment, implementation science or quality improvement. It is a practical label that prompts educators to ask whether a scored or repeatedly taught step still has a current, explicit rationale.

Defining potential procedural standards drift

The operational trigger should be conservative. A step should enter formal review only when three conditions are present: at least two relevant sources or curricular artefacts give incompatible instructions or expectations; the difference lacks an explicit and current rationale linked to patient population, clinical setting, resource availability, policy or patient preference; and the difference could plausibly affect safety, effectiveness, learner understanding, assessment fairness or resource use. Meeting these conditions identifies potential drift; it does not by itself establish which source is correct.

Ordinary variation is different. Two clinically equivalent options may coexist without drift if learners are taught when each is acceptable and assessment does not penalise a justified choice. A local adaptation is also legitimate when its rationale, scope and review date are documented. Differences between guidelines may reflect population, outcomes, publication date or evidence certainty. Drift is more likely when a discrepancy is invisible, persists only because an older

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artefact was not updated, or rewards a ritual after its rationale has weakened.

These distinctions also clarify the proposed term's added value. Curriculum mapping can show where a procedure is taught; implementation science can explain how a recommendation enters practice; and quality improvement can support change. The proposed lens asks a complementary maintenance question at the level of each procedural step: are the current evidence, teaching materials, demonstrations, equipment and assessment criteria still mutually defensible? Table 1 converts this question into classification rules rather than treating every difference as an error.

Lumbar puncture as a sentinel case

Lumbar puncture is a useful sentinel case because it is common, consequential and taught across specialties. It remains important in the evaluation of neurological infection, inflammatory disease, intracranial pressure disorders and selected emergency presentations.[6-9] It is also a procedure for which evidence and guidance have changed in areas that directly affect teaching, including anatomical landmarking, needle design and post-procedure management.[10-16]

Surface landmarking illustrates the difference between a teachable rule and anatomical certainty. The intercristal line is a useful starting landmark, but magnetic resonance imaging showed that anaesthetists identified the intended marked lumbar interspace correctly in only 29% of 100 patients and usually erred in a cephalad direction.[16] A curriculum that presents the line as an exact vertebral level may therefore overstate certainty; a more defensible standard is to teach it as an approximate landmark and to recognise when further localisation or a more cautious level selection is warranted.[9,10] Needle choice provides a second example. A systematic review and clinical practice guideline support atraumatic needles for many diagnostic lumbar punctures because they reduce post-dural puncture headache without compromising procedural success.[12,13] If teaching, procurement and assessment continue to assume a conventional cutting needle as the universal default without a documented reason, the misalignment is not merely stylistic.

Post-procedure routines provide a third example. Systematic reviews do not support routine bed rest or increased fluid intake to prevent post-dural puncture headache.[14,15] Treating either practice as a mandatory scored item would convert a legacy routine into an assessment requirement.

Chinese textbooks and clinical skills manuals are one example of the multiple sources that learners and teachers consult, but the mechanism is not country-specific.[17-21] Wherever procedural teaching depends on sources revised by different groups and on different schedules, contradictions can accumulate. Table 2 uses the lumbar puncture examples to show how a discrepancy can be identified without assuming that every local difference is inappropriate.

Why the challenge extends beyond lumbar puncture

The same maintenance challenge appears in other procedures. International recommendations for vascular access have incorporated ultrasound and explicitly call for training curricula; simulation-based education for central venous catheterisation has improved learner outcomes and selected clinical outcomes.[27,28] Resuscitation education is likewise tied to periodically updated international science and treatment recommendations.[29] In each setting, a current clinical standard can fail to reach teaching, equipment or assessment at the same time. The specific procedure changes, but the governance vulnerability is the same.

Why alignment matters

Checklists are valuable, but checklist thinking can be too narrow. A checklist asks whether a learner performed the item. Governance thinking asks whether the item still deserves to be there, whether it is aligned with evidence, whether faculty know how to explain it, and whether assessment rewards the same standard that teaching promotes.

This distinction matters because procedural education is powerful. Deliberate practice and simulation can improve procedural performance, and assessment tools can shape readiness decisions.[22-26] If teaching and assessment are aligned with current evidence, that educational power supports defensible preparation for practice. If they are aligned with obsolete or internally inconsistent micro-standards, the same power can stabilise the discrepancy.

Some procedural elements should be stable across settings because they protect safety. Others are principles that require adaptation. If this boundary is not explicit, rigid checklists can reward ritualised performance, whereas loosely specified teaching can leave learners unsure what competence means. Misalignment can also undermine assessment validity, expose learners to conflicting faculty instructions and normalise practices later carried into patient care.

A practical standards-governance process

Assign ownership and review triggers

Accountability should rest with the programme or curriculum committee rather than an individual instructor. For each procedure, the committee should designate an operational review group that includes a procedure-specific clinician, a clinical skills educator, an assessment lead, a patient-safety or infection-prevention representative when relevant, a librarian or evidence-methods adviser, a frontline teacher and a learner representative. One named chair should own the decision log and ensure that approved changes reach every curriculum artefact.

Review frequency should reflect risk and the pace of evidence change. As a pragmatic starting point, programmes

Table 1. Proposed criteria for classifying procedural steps during curriculum review

Category	Minimum assignment rule	Treatment in teaching and assessment
Evidence-supported	A current, methodologically credible guideline or systematic review directly supports the step for the relevant population and outcome, with no material contradictory source.	Teach and assess as the default. Make mandatory only when the benefit, safety implication and local applicability justify it.
Consensus-supported	Comparative evidence is limited, but current multidisciplinary or professional consensus supports the step and states its rationale.	Teach as recommended and identify its consensus basis. Set a review trigger when new evidence becomes available.
Context-adaptable	More than one option is defensible, or the choice depends on patient factors, setting, policy, equipment, resources or preference.	Teach the conditions governing each option. Do not penalise a justified equivalent choice; document the local adaptation and review date.
Legacy	The step is retained mainly by custom or a superseded source, and no current safety, effectiveness or implementation rationale is documented.	Remove it from mandatory teaching and scoring unless review identifies a defensible rationale. Record why it was retired or retained.
Uncertain or contested	Current sources conflict, evidence certainty is low, or applicability remains unresolved after structured review.	Teach the uncertainty and acceptable options. Avoid one-option scoring unless a safety requirement applies and set a dated re-review.

Table 2. Examples of potential procedural standards drift in lumbar puncture education and proposed responses

Procedural element	Evidence-alignment signal	Proposed governance response
Surface landmarking	The intercristal line is an approximate landmark, and clinical identification of a lumbar interspace can be inaccurate.[9,10,16] Potential drift is signalled when a fixed vertebral level is taught or scored as anatomically certain.	Teach the landmark's uncertainty, specify a safe decision rule and define when further localisation or a more cautious level is required. Do not score false precision.
Needle design	Atraumatic needles reduce post-dural puncture headache for many diagnostic procedures.[12,13] Potential drift is signalled when teaching, procurement or assessment assumes a cutting needle as the universal default without a current rationale.	Align equipment, demonstrations and rubrics with the approved standard. Record justified exceptions for population, indication or availability.
Post-procedure routines	Routine bed rest and increased fluids do not prevent post-dural puncture headache.[14,15] Potential drift is signalled when either remains a mandatory scored step or universal patient instruction.	Remove unsupported universal requirements, retain appropriate symptom advice and document any context-specific aftercare decision.

could conduct a brief annual signal scan and a full review every two to three years. A new guideline or systematic review, a change in equipment or policy, a safety incident, a recurrent learner report or a contradiction detected during assessment should trigger an earlier review.[2,5] These intervals are proposed starting points rather than validated universal standards.

Assemble and appraise the relevant sources

The group should crosswalk the current clinical guideline or systematic review, local policy, textbook or manual, faculty guide, simulation script, assessment rubric, learner-facing material and available equipment. For each source, it should record the publication or revision date, target population, clinical setting, relevant outcomes, certainty of evidence and local applicability. International best practice should not be selected by prestige alone; currency, methodological quality, population fit, feasibility, equity and patient preferences all require consideration.[3,4]

Classify each procedural step reproducibly

Two reviewers should independently assign each disputed step to one of the five categories in Table 1and record the source and rationale. Agreement should be checked before group discussion. Disagreements should be adjudicated by the multidisciplinary group rather than concealed by a majority label. This procedure will not eliminate judgement, but it makes judgement visible and gives later reviewers a record to revisit.

Resolve disagreement without forcing false uniformity

When sources disagree, applicable regulatory and safety requirements should first be identified. The group should then compare evidence certainty, directness to the learner's future setting, benefits and harms, feasibility and patient preferences. A documented local adaptation may be preferable to uncritical adoption of an international recommendation. If disagreement remains reasonable, the step should be classified as uncertain or context-adaptable, the competing options should be taught explicitly, and assessment should not reward only one option unless a safety requirement makes that necessary.

Synchronise, communicate and monitor

An approved decision should be implemented as a coordinated release. The checklist, assessment rubric, faculty guide, simulation scenario, learner material, equipment list and patient information should carry the same version date and rationale. Superseded materials should be withdrawn, and both faculty and learners should receive a concise change notice. During transitions, learners should not be penalised for following a previously authorised standard.

Learners should have a visible route to report conflicting instructions and should participate in review, because they often encounter discrepancies across rotations before curriculum leaders do. Monitoring can begin with process measures: concordance across documents, the proportion of assessed steps with a recorded rationale, the time from an update signal to implementation, recurrent discrepancy reports and sampled agreement between teaching and assessment. These measures test whether the governance process works before claims are made about patient outcomes.

Limitations and priorities for evaluation

Potential procedural standards drift is proposed here as a practical diagnostic label, not as a validated theory or measurement instrument. The lumbar puncture examples demonstrate plausibility but do not estimate how often drift occurs, and the proposed categories and review intervals require testing in different health professions and resource settings. Evaluation should examine inter-reviewer agreement, time and expertise required, the proportion of disagreements resolved, concordance across teaching and assessment, learner-reported confusion, assessment validity and, where feasible, relevant clinical process measures. Evidence of benefit should determine whether this framework merits wider adoption.

Conclusions

Procedural competence is not only a property of the learner; it also depends on the competence of the curriculum to maintain its own standards. The proposed lens of potential procedural standards drift does not demand identical practice across settings. It demands that differences are visible, justified, reflected consistently in teaching and assessment, and reviewed when evidence or context changes. A programme can begin with one common procedure, one crosswalk and one accountable review group. That modest process can turn a checklist from an inherited document into a maintained educational standard.

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Conflict of Interest

The authors declare that they have no conflicts of interest.

References

1. Harden RM. AMEE guide no. 21: curriculum mapping: a tool for transparent and authentic teaching and learning. Med Teach. 2001;23(2):123-137.
2. Hays RB, Wilkinson T, Green-Thompson L, McCrorie P, Bollela V, Nadarajah VD, et al. Managing assessment during curriculum change: Ottawa consensus statement. Med Teach. 2024;46(7):874-884.
3. Graham ID, Logan J, Harrison MB, Straus SE, Tetroe J, Caswell W, et al. Lost in knowledge translation: time for a map? J Contin Educ Health Prof. 2006;26(1):13-24.
4. Schunemann HJ, Wiercioch W, Brozek J, Etxeandia-Ikobaltzeta I, Mustafa RA, Manja V, et al. GRADE evidence to decision (EtD) frameworks for adoption, adaptation, and de novo development of trustworthy recommendations: GRADE-ADOLOPMENT. J Clin Epidemiol. 2017;81:101-110.
5. Wong BM, Headrick LA. Application of continuous quality improvement to medical education. Med Educ. 2021;55(1):72-81.
6. McGill F, Heyderman RS, Michael BD, Defres S, Beeching NJ, Borrow R, et al. The UK joint specialist societies guideline on the diagnosis and management of acute meningitis and meningococcal sepsis in immunocompetent adults. J Infect. 2016;72(4):405-438.
7. Tunkel AR, Hasbun R, Bhimraj A, Byers K, Kaplan SL, Scheld WM, et al. 2017 Infectious Diseases Society of America's clinical practice guidelines for healthcare-associated ventriculitis and meningitis. Clin Infect Dis. 2017;64(6):e34-e65.
8. Tumani H, Petereit HF, Gerritzen A, Gross CC, Huss A, Isenmann S, et al. S1 guidelines "lumbar puncture and cerebrospinal fluid analysis" (abridged and translated version). Neurol Res Pract. 2020;2:8.
9. Engelborghs S, Niemantsverdriet E, Struyfs H, Blennow K, Brouns R, Comabella M, et al. Consensus guidelines for lumbar puncture in patients with neurological diseases. Alzheimers Dement (Amst). 2017;8:111-126.
10. Boon JM, Abrahams PH, Meiring JH, Welch T. Lumbar puncture: anatomical review of a clinical skill. Clin Anat. 2004;17(7):544-553.
11. Ellenby MS, Tegtmeyer K, Lai S, Braner DA. Videos in clinical medicine. Lumbar puncture. N Engl J Med. 2006;355(13):e12.
12. Nath S, Koziarz A, Badhiwala JH, Alhazzani W, Jaeschke R, Sharma S, et al. Atraumatic versus conventional lumbar puncture needles: a systematic review and meta-analysis. Lancet. 2018;391(10126):1197-1204.
13. Rochwerg B, Alhazzani W, Siemieniuk RAC, Vandvik PO, Agoritsas T, Lytvyn L, et al. Atraumatic (pencil-point) versus conventional needles for lumbar puncture: a clinical practice guideline. BMJ. 2018;361:k1920.
14. Thoennissen J, Herkner H, Lang W, Domanovits H, Laggner AN, Mullner M. Does bed rest after cervical or lumbar puncture prevent headache? A systematic review and meta-analysis. CMAJ. 2001;165(10):1311-1316.
15. Arevalo-Rodriguez I, Ciapponi A, Roque i Figuls M, Munoz L, Bonfill Cosp X. Posture and fluids for preventing post-dural puncture headache. Cochrane Database Syst Rev. 2016;3(3):CD009199.

16. Broadbent CR, Maxwell WB, Ferrie R, Wilson DJ, Gawne-Cain M, Russell R. Ability of anaesthetists to identify a marked lumbar interspace. Anaesthesia. 2000;55(11):1122-1126.
17. Wan XH, Lu XF, editors. Diagnostics. 10th ed. Beijing: People's Medical Publishing House; 2024. [in Chinese].
18. Hao JW, Luo BY, editors. Neurology. 9th ed. Beijing: People's Medical Publishing House; 2024. [in Chinese].
19. Cao H, Chen B, editors. Clinical practical skills. 1st ed. Beijing: People's Medical Publishing House; 2024. [in Chinese].
20. Jiang BG, Chen H, editors. Clinical skills guide for Chinese medical students. 3rd ed. Beijing: People's Medical Publishing House; 2020. [in Chinese].
21. Jia JP, Chen SD, editors. Neurology. 8th ed. Beijing: People's Medical Publishing House; 2018. [in Chinese].
22. McGaghie WC, Issenberg SB, Cohen ER, Barsuk JH, Wayne DB. Does simulation-based medical education with deliberate practice yield better results than traditional clinical education? A meta-analytic comparative review of the evidence. Acad Med. 2011;86(6):706-711.
23. Barsuk JH, Cohen ER, Caprio T, McGaghie WC, Simuni T, Wayne DB. Simulation-based education with mastery learning improves residents' lumbar puncture skills. Neurology. 2012;79(2):132-137.
24. McMillan HJ, Writer H, Moreau KA. Lumbar puncture simulation in pediatric residency training: improving procedural competence and decreasing anxiety. BMC Med Educ. 2016;16:198.
25. Lydon S, Reid McDermott B, Ryan E. Can simulation-based education and precision teaching improve paediatric trainees' behavioural fluency in performing lumbar puncture? A pilot study. BMC Med Educ. 2019;19:138.
26. Henriksen MJV, Wienecke T, Thagesen H, Jacobsen RVB, Subhi Y, Ringsted C, et al. Assessment of residents readiness to perform lumbar puncture: a validation study. J Gen Intern Med. 2017;32(6):610-618.
27. Lamperti M, Bodenham AR, Pittiruti M, Blaivas M, Augoustides JG, Elbarbary M, et al. International evidence-based recommendations on ultrasound-guided vascular access. Intensive Care Med. 2012;38(7):1105-1117.
28. Ma IWY, Brindle ME, Ronksley PE, Lorenzetti DL, Sauve RS, Ghali WA. Use of simulation-based education to improve outcomes of central venous catheterization: a systematic review and meta-analysis. Acad Med. 2011;86(9):1137-1147.
29. Greif R, Lockey A, Breckwoldt J, Carmona F, Conaghan P, Kuzovlev A, et al. European Resuscitation Council guidelines 2021: education for resuscitation. Resuscitation. 2021;161:388-407.