Porcine procedure pads

How to build a teaching tool that's a cut above

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Procedural skills are undoubtedly a key component of family medicine and are therefore integral to resident education. A College of Family Physicians of Canada working group identified 65 core procedural skills; of these, there was almost 100% agreement among survey respondents that suturing, laceration repair, excision of dermal lesions, skin scraping, and incision and drainage of abscesses are skills that a resident finishing a 2-year curriculum should be competent to perform.[1] However, procedural skill expectations of Canadian family medicine residency programs vary widely, and learners in urban environments experience less training in procedures than their rural counterparts do.[2,3]

Exposure to practice opportunities is essential to resident learning. As access to patients might be limited, educators often employ simulation as a strategy for teaching basic procedural skills. An excellent article published by *Canadian Family Physician* in 2013 highlighted how an inexpensive yet comprehensive dermatologic procedures pad (CDPP) could be created.[4] In brief, the CDPP is a 7×10-cm training pad that provides exposure to the following procedures: basic suturing, punch biopsy, shave biopsy, cyst removal, excisional biopsy, and toenail excision. This model employed the use of a simple foam pad as a skin substrate. In this article we outline how the substitution of an organic substrate (porcine skin) facilitates a more lifelike experience for learners while decreasing cost, summarize the details of pad construction, and discuss the nuances of using an organic substrate.

Figure 1. Required materials for pad construction (from top left): *Porcine skin (measuring 7 by 10 cm), salmon oil capsules, mosquito forceps, acrylic nails, artificial nail glue, marker, scalpel, and alcohol wipes (not shown).*

Pad construction

Figure 1 presents the required materials. Full details of construction have been previously described.[4] In summary, 5 steps are required to complete the pad:

Step 1. Create lacerations for suture repair.
Step 2. Draw nevi for both punch and excisional biopsy.
Step 3. Insert the "cyst" (ie, salmon oil capsule) for excision.
Step 4. Apply the acrylic nail for wedge resection.
Step 5. Apply nail glue for shave biopsy.

The completed pad is shown in **Figure 2.**

Porcine skin

We were able to procure, with minimal effort, precut pieces of porcine skin from a local butcher. We purchased pieces for $0.99 a pound. The cost for the skin pieces was less than $5 of the total cost for the cohort materials (**Table 1**). It is a good idea to ask the butcher to leave as much fat on the skin as possible in order to provide a thicker pad; this will facilitate both the insertion of the "cyst" (salmon oil capsule) and exposure to the layers of suturing. To successfully draw nevi on the skin, we recommend prewiping it with alcohol wipes.

As the material has the potential to expire, we premake our pads and freeze them. This has no deleterious effects on the structural integrity of the skin pads. The models are transitioned from the freezer to the fridge 3 days before use and warmed to room temperature 3 hours before the workshop.

Similar to the CDPP, a "cyst" is inserted into the pad for removal. Rather than the posterior approach previously described,[4] we found that a subdermal incision on the lateral aspect of the pad provided an entry point for blunt dissection with mosquito forceps (**Figure 3**).

Figure 2. Completed pad (associated procedural skills)

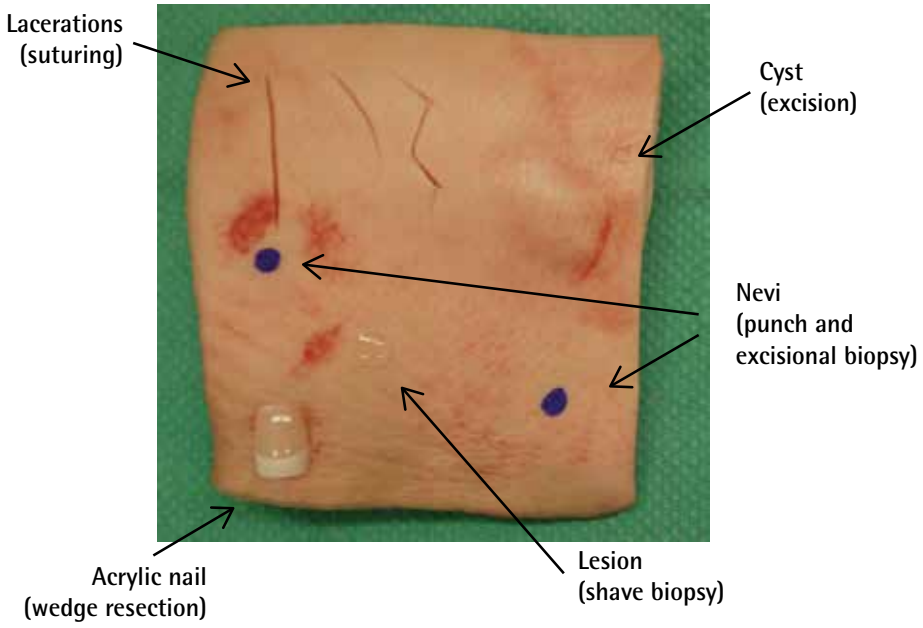
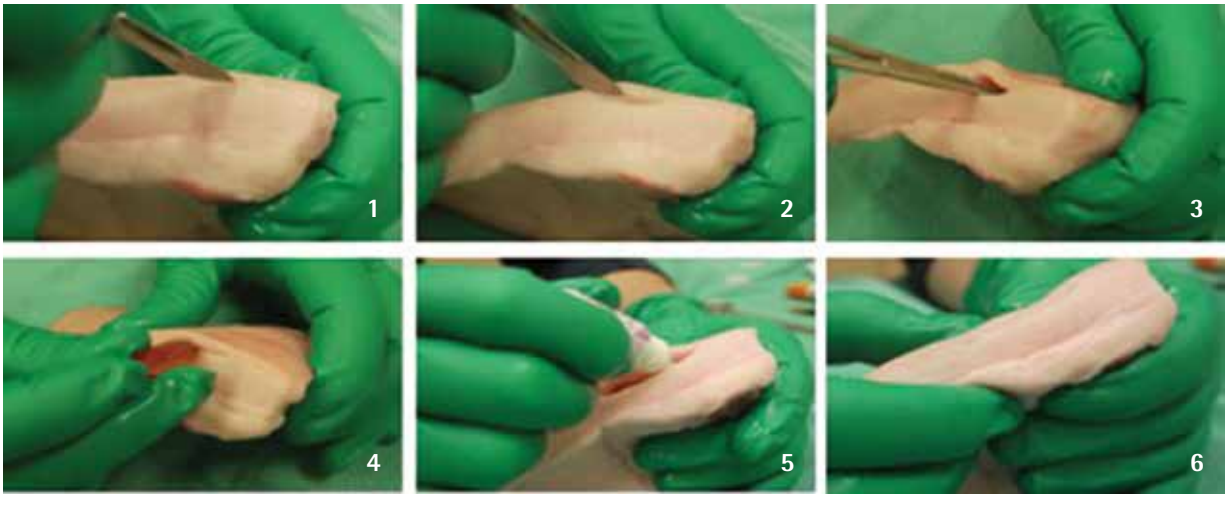


Table 1. List of materials and costs: *Total cost for 25 procedure pads is $35; cost per pad is $1.40.*

MATERIALS	UNITS	COST, $
Artificial nails (natural colour)	1 (28 per package)	7
Artificial nail glue	2	10
Porcine skin pieces	25	5
Marker	1	1
Salmon oil capsules	1 (100 per bottle)	12

Figure 3. Simulating a subcutaneous cyst: *1 and 2) Subdermal skin incision, 3) blunt dissection with mosquito forceps, 4) insertion of capsule, 5) application of 2 to 3 drops of artificial glue on lateral incision, and 6) application of pressure until sealed.*



Once a path is dissected, the "cyst" is inserted into the canal. The canal is then closed with a small amount of artificial nail glue. The result is an easily palpable mass to be removed by the learner. We have found that once the capsule is embedded in the organic tissue, the outer shell of the capsule softens and becomes a soft, cystlike entity. The strong odour of the salmon capsule is an added benefit over using vitamin E capsules because it provides an incentive not to rupture the "cyst."

Benefits

We found that our learners enjoyed having a lifelike material to work with, as the layers of the dermis and subcuticular tissues were easily appreciated. The use of organic skin and fat allowed for undermining of lacerations for better approximation and eversion of wound edges—both important cosmetic outcome predictors. Students particularly liked removing their "cysts" and the added challenge of not rupturing their slightly malodorous contents. The porcine skin was considerably more cost-effective than the available foam substrates were. We were able to re-create the CDPP with porcine tissue for $1.40 per model (**Table 1**) and created 25 pads in less than an hour with a team of 4.

Considerations

We believe that the use of organic material provides a heightened learning experience without an increase in cost or production time. As the substrate is organic, food-grade material, we suggest maintaining proper storage temperatures, practising good hand hygiene, and cleansing work surfaces and tools to prevent any chance of food-borne disease. There are some additional considerations such as their being limited to a single use, tissue irregularity (varying thickness of fat backing), and access; however, we believe that the added benefit of a higher fidelity simulation outweighs these minor considerations.

Conclusion

Development of procedural skills has been identified as a core component of the family medicine education experience. Greater exposure and teaching through simulation with organic tissue models might facilitate unique learning opportunities in the development of procedural skills.

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Competing interests
None declared

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