

Improved Syringe for Arterial Blood Sampling

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Puncture of a radial artery using a 1-ml disposable Mantoux syringe with a 25-g needle has been our technique of choice for obtaining blood for determination of blood gases and pH for the last four years.¹ Since perforation of the artery is not indicated by blood running into the syringe, withdrawal of the plunger is necessary to fill the syringe, a maneuver that may dislocate the needle. By a small change in the construction of the syringe this difficulty can be omitted.† An outward bulge is made in the upper part of the barrel of an ordinary Mantoux syringe (fig. 1). Before use the deadspace of the syringe is filled with heparin and the plunger is withdrawn to a position that permits air to escape through the vent. Upon perforation of the vessel, arterial pressure will fill the syringe and expel the air. After filling, the sample is sealed anaerobically by pressing the plunger past the bulge. If the syringe is overfilled, blood will run through the vent and be deposited within the cylinder above the membrane of the plunger. This is in contrast to overfilling of a syringe barrel with a side hole, which will result in contamination of the outside of the syringe with blood.

Our practical experience using 1,000 syringes has been satisfactory. The only

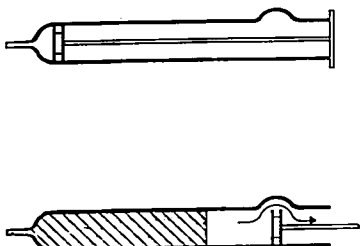


FIG. 1. Syringe for arterial blood sampling.

problem has been the time needed to fill the syringe, which is 15–30 seconds using 25-g needles. During this time dislocation of the needle may occur, especially in struggling children. The time needed to fill the syringe is of course dependent on the size of the needle and the driving pressure. We have preferred 25-g needles to minimize the traumatic effects on the artery. In principle this technique could be used for venous blood sampling, too, using larger-bore needles to compensate for the smaller driving pressure. This has not been investigated.

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† Blood Sampling Syringe, code 956-165, Radiometer A/S, Emdrupvej 72, Copenhagen.

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