

# Iontophoresis for Palmar and Plantar Hyperhidrosis



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## KEYWORDS

- Hyperhidrosis • Hyperhidrosis treatments • Iontophoresis • Palmar hyperhidrosis
- Plantar hyperhidrosis • Palmoplantar hyperhidrosis • Excessive sweating

## KEY POINTS

- Iontophoresis has a long history of safe and effective use.
- Once a home device is obtained and the patient has received adequate education and training, the maintenance cost and effort are minimal for the patient and health care provider, alike.
- Iontophoresis should not be overlooked as a primary treatment of palmar and plantar hyperhidrosis.

Iontophoresis has been used to treat palmar hyperhidrosis (Fig. 1) and plantar hyperhidrosis (Fig. 2) for more than 70 years. Although its mechanism of action is still not entirely understood, iontophoresis has proved to provide reliable, effective treatment when practiced with appropriate technique, timing, and tweaks (as necessary). Patients who prefer to manage their excessive sweating treatment at home may find that, after they have learned the treatment process from a health care professional, iontophoresis is a particularly attractive option. In addition, many health insurance programs consider treatment with iontophoresis for hyperhidrosis medically necessary when antiperspirants have been ineffective or have resulted in a skin irritation.

Iontophoresis is the passing of an ionized substance through intact skin by the application of a direct electrical current.<sup>1</sup> In most cases, simple tap water and an iontophoresis medical device are all that is required to achieve sweat relief, and many dermatologists consider the treatment to be first line to address primary focal palmar or plantar hyperhidrosis.<sup>1,2</sup> In some situations, adjustments to the regimen may be necessary (eg, adding baking soda or an anticholinergic to the water); these are discussed later. Three iontophoresis

devices are available in the United States, and registered with the US Food and Drug Administration for the treatment of hyperhidrosis. These devices are the R.A. Fischer (both MD-1a and MD-2 models) and the Drionic.

As mentioned earlier, studies have not yet fully explained the provenance of the efficacy of iontophoresis. However, there are several theories, including the plugging of sweat glands as a result of ion deposition,<sup>3</sup> a blocking of sympathetic nerve transmission,<sup>2</sup> or a decrease in pH as a result of accumulation of hydrogen ions.<sup>4</sup>

## EFFICACY

Regardless of why it works, studies have shown that iontophoresis does provide relief from excessive sweating symptoms for many patients. For instance, an early (1952) observational study of iontophoresis in 113 patients with palmoplantar hyperhidrosis<sup>5</sup> reported a response rate of 91% and showed that adding ionizable agents to the water did not improve the results.

In a study published in 1987, 18 patients with palmar hyperhidrosis were treated with iontophoresis for 1 hand, and the other hand served as the control. These patients were treated with 12 to

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Fig. 1. Severe palmar hyperhidrosis for treatment by iontophoresis. (Courtesy of Albert Ganss, International Hyperhidrosis Society, Quakertown, PA; with permission.)

20 mA for 20 minutes, 3 times a week, for 3 weeks. The results showed that 15 of 18 participants had markedly reduced sweat production in their treated hands.<sup>6</sup>

In addition, a 1989 controlled trial with 11 patients randomized to actual or sham procedures reported 81% reduction in sweat production measured by gravimeter after a median of 10 treatments. The symptom improvement was thereafter maintained with treatment every other week.<sup>7</sup> Similarly, a 2002 controlled trial of 112 patients diagnosed with palmar hyperhidrosis showed

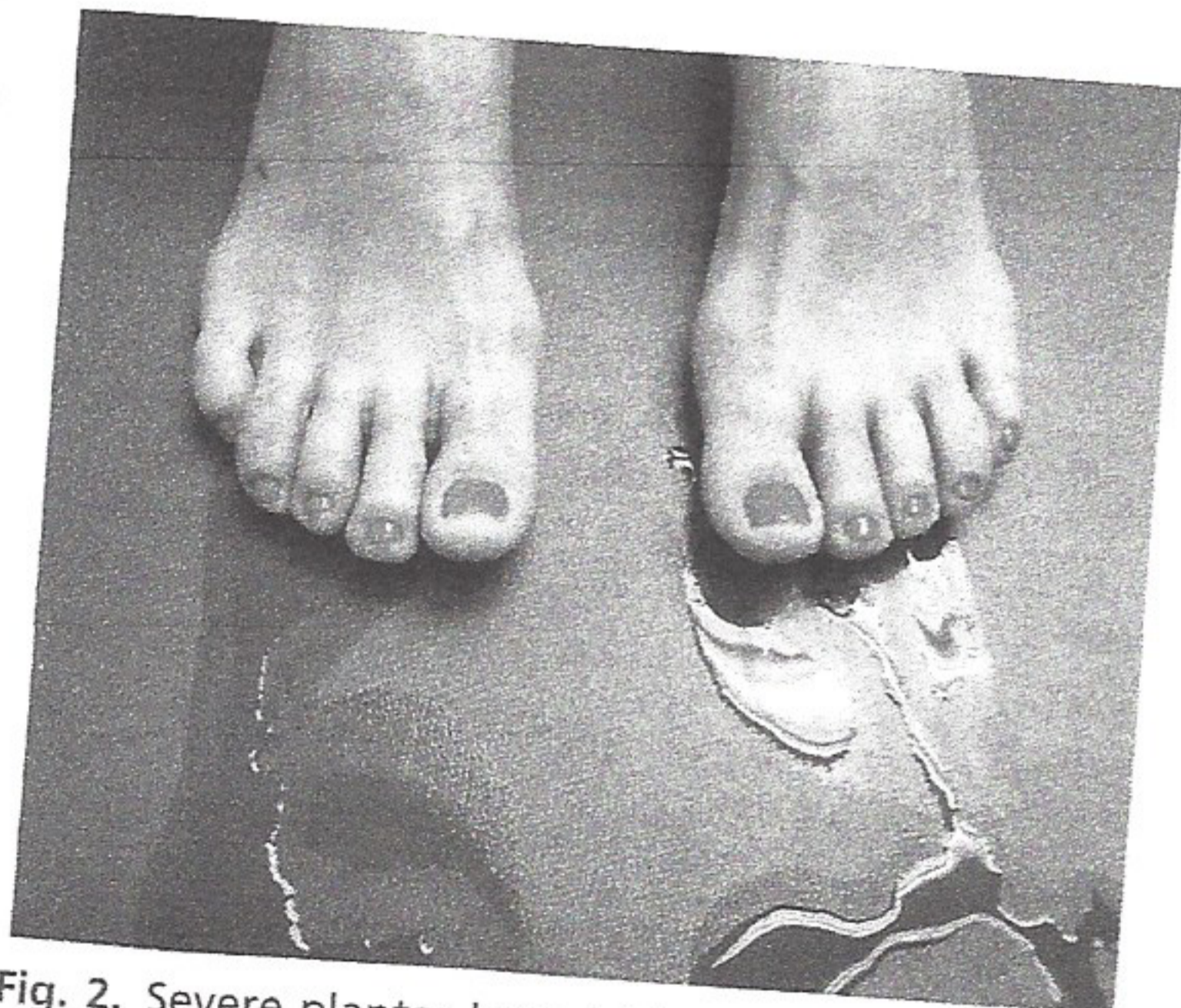


Fig. 2. Severe plantar hyperhidrosis for treatment by iontophoresis. (Courtesy of Albert Ganss, International Hyperhidrosis Society, Quakertown, PA; and Adelaide Hebert, MD, University of Texas, Houston, TX; with permission.)

that, after 8 treatments, sweating was reduced 81.2% from baseline. This reduction was seen 20 days after the eighth treatment, with the mean return of symptoms occurring at 35 days.<sup>8</sup>

### ADVERSE EVENTS

Adverse events from iontophoresis are usually mild and do not necessitate termination of the treatment. Often, proper technique and education of the patient can prevent adverse events and side effects. For instance, to prevent mild shocks, patients should be reminded to keep their hands or feet in the water trays while the device is in use and to avoid touching the electrodes.<sup>1</sup> Scratches and cuts on the surface of the area to be treated should be covered with a thin layer of petroleum jelly.<sup>1,9</sup> Petroleum jelly may also be applied along the water line to help prevent erythema of that region.

Vesiculation in the affected area has been reported, but is usually transient.<sup>6</sup> Eight of 112 patients reported vesiculation in a 2002 study.<sup>8</sup>

Redness of the skin, often along the water line, is also commonly reported.<sup>6</sup> Twelve of 122 patients reported erythema in the 2002 study.<sup>8</sup>

Both erythema and vesiculation can be treated with 1% hydrocortisone cream, if these symptoms persist. Prevention may be achieved via petroleum jelly application.<sup>1</sup>

Discomfort, either as a burning sensation or pins and needles, is also common. All patients in 1 series complained of pins and needles, and 20 of 112 complained of the burning sensation.<sup>6,8</sup>

Sometimes, the treatment area may become dry, cracked, or fissured. In these instances, moisturizers or decreasing the frequency of iontophoresis sessions may be necessary.<sup>1</sup>

### CONTRAINDICATIONS

Women who are pregnant or people with pacemakers or substantial metal implants (in the path of the electrical current, such as joint replacements), cardiac conditions, or epilepsy should not use iontophoresis.

### RECOMMENDED REGIMEN

Iontophoresis treatment usually begins in the clinic under the direction and care of a health care professional. Once the desired results have been achieved, or it seems that the patient has a clear understanding of iontophoresis and has gained the necessary know-how, the health care provider may determine that they are ready to perform treatments at home using a device purchased or rented for that purpose.

As mentioned earlier, apply petroleum jelly with a cotton swab to cover any cuts on hands or feet before immersing them in the water trays/baths. To relieve skin irritation that may have already occurred, apply 1% hydrocortisone cream after treatment.

Initially, iontophoresis treatments are required on a more frequent basis. It is often recommended that treatments begin with a Monday, Wednesday, and Friday schedule until the condition improves. Then, the treatments can be tapered down to once per week. Once per week seems to be ideal in terms of maintaining effectiveness and limiting inconvenience to the patient.

Use regular tap water.<sup>2</sup> Fill the trays with just enough water to cover the hands (Fig. 3A) or feet (see Fig. 3B) or 1 hand and 1 foot (see Fig. 3C).<sup>1</sup>

After placing the body part in the device tray, turn the machine on. Slowly increase the amperage until a tingling that is not unpleasant is felt in the affected area,<sup>9</sup> or to a maximum of 20 mA.<sup>1</sup> To start, treat for 20 minutes a session every 2 to 3 days.<sup>1</sup> Halfway through the 20-minute session, reverse current flow to switch anode site to opposite side.<sup>1</sup> Frequency of maintenance treatment varies, but 1 to 3 times a week is usually necessary.<sup>2</sup>

If mineral content of tap water is low (water may be termed as being too soft), insufficient current flow may occur. This situation can be corrected by adding 5 g (1 teaspoon) of baking soda to each tray.<sup>1</sup>

If a patient fails to respond to tap water iontophoresis alone, and after mineral content of the tap water has been addressed, consider adding an anticholinergic to the water trays, such as 2-mg tablets of glycopyrrolate (crushed). Adjust the dose based on efficacy or side effects.<sup>1</sup> In a study of 20 patients with palmar and plantar hyperhidrosis,<sup>10</sup> when glycopyrrolate was added to the iontophoresis water trays (bilateral/both trays, unilateral/1 side only, or tap water alone), dryness was achieved for 11 days (bilateral glycopyrrolate), 5 days (unilateral glycopyrrolate), and 3 days (tap water alone). It has been suggested that the bilateral glycopyrrolate was more effective because of greater systemic absorption of the anticholinergic.

Patients who do not respond to iontophoresis may be candidates for a combination therapy, such as an iontophoresis regimen combined with clinical strength over-the-counter antiperspirants or prescription antiperspirants applied at night, before bedtime (see article on related topical treatments for hyperhidrosis elsewhere in this issue by

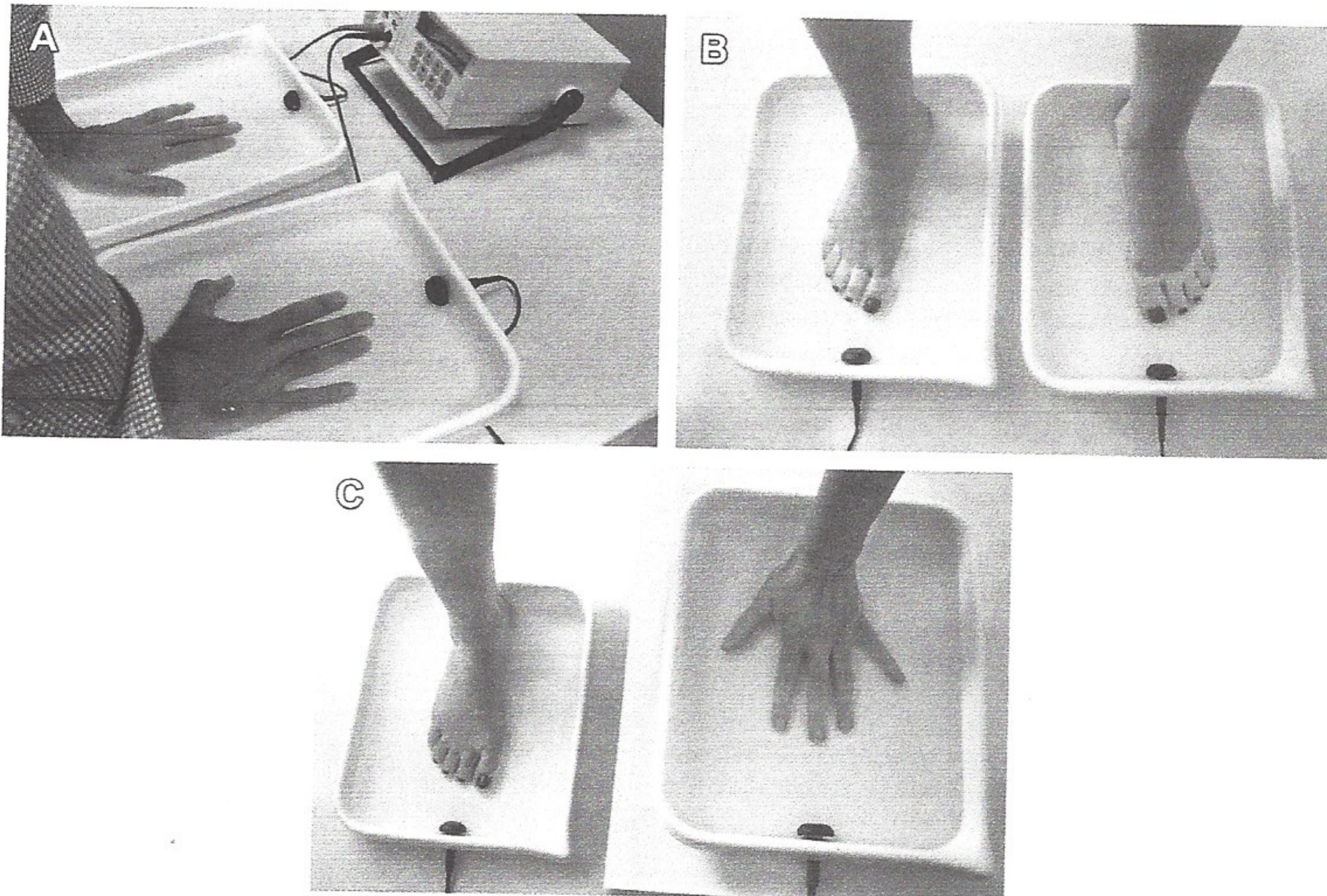


Fig. 3. Fill the trays with just enough water to cover (A) the hands, (B) the feet, or (C) 1 hand and 1 foot. (Courtesy of Albert Ganss, International Hyperhidrosis Society, Quakertown, PA; with permission.)

Pariser and Ballard). This mixed therapy can allow for less frequent iontophoresis treatment of patient convenience and compliance.

Iontophoresis has a long history of safe and effective use and, once a home device is obtained and the patient has received adequate education and training, the maintenance cost and effort are minimal for the patient and health care provider, alike. Thus, iontophoresis should not be overlooked as a primary treatment of palmar and plantar hyperhidrosis.

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