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Opinion

Stem cell soup: A new recipe for an old fraud

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Abstract. The sale of evidence-poor cell-based interventions is characterized by shoddy science and clever marketing.

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The marketing of medical interventions involving putative stem cells relies on a stock of fictional narratives. Advertisers claim that that somatic stem cells exhibit broad multi-lineage differentiation, highly targeted *in situ* migration, and a range of therapeutic responses, from production of healthy cells for local tissue repair, to molecular signaling, to immunomodulation. They portray stem cells as disruptive and revolutionary, and thus a threat to the medical and pharmaceutical establishments, which seek to suppress their use. They tell patients that autologous cells are "your own property" and thus exempt from government oversight [1]. Above all, they invoke the powerful stem cell label in the face of skepticism and debate over whether the industry's preferred cell type, the "mesenchymal stem cell," is a stem cell at all [2].

The use of such narratives is essential for businesses marketing medical claims in the absence of scientific credibility, institutional acceptance, and regulatory authorization. The emergence of a novel storytelling device in this space is thus worthy of critical attention. The narrative in question first appeared the mid-2010 s, when a California physician described his infusions of adipose-derived stromal vascular fraction as "the soup [3]."A New York clinic similarly described its preparation of autologous adipose cells as soup [4]. Numerous other stem cell marketers have since embraced the soup designation [5–8]. In 2017, the International Society for Stem Cell Research (ISSCR) felt compelled to issue a consumer alert on the risks of stem cell soup injections [9].

Why have entrepreneurs on the fringes of medicine converged on this kitchen vernacular? Soup carries popular connotations of being simple, home-cooked, nutritious, and even (as seen in the folklore surrounding chicken soup) therapeutic, all of which are attractive for marketing purposes. Moreover, the heterogeneity of the typical bowl or spoonful of soup provides ambiguity and deniability to sellers. The California doctor cited above stated to a reporter, "I don't even know what's in the soup . . . .Most of the time, if stem cells are in the soup, then the patient's got a good chance of getting better."

By disavowing knowledge of its contents and the predictability of its effects, the seller is able to avoid making any claim about whether a particular serving of "soup" includes stem cells, and indeed that even when stem cells are present, its effects on a specific patient are uncertain. Such claims of ignorance have clear value in deterring litigation by disappointed buyers, but also raise important questions about what,

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if anything, advertisers of autologous stem cell interventions are willing to claim with certainty.

Its commercial utility aside, the soup analogy in striking ways parallels and modernizes elements of a well-known European folk tale, commonly known as the story of "stone soup." In this tale, a hungry trickster walks into a rural village and announces that he will make soup using only a magical stone. Skeptical villagers provide him a pot of water and gather to watch. After sampling the broth, he declares that it would be even better with some carrots, then some onions, herbs, cuts of meat and so on, all of which the curious and eager villagers provide. By the end of the performance, the trickster has convinced the town that he has made a delicious pot of soup from a magic stone.

Crucially, in most versions of the story, the villagers never realize that they have been tricked; in others, they catch on but are delighted at the cleverness and boldness of the lie. In any case, rarely does the trickster suffer any consequences. While catalogues of folklore motifs typically index the stone soup tale under the heading Deception, I argue that its specific features form a narrative pattern I label the "consented dupe," which offers obvious advantages in how sellers of pseudo-medicine conceive of and represent themselves and their business practices.

By consented, I wish to highlight how patients are persuaded to cooperate in the con through the superficial assurances of an "informed consent" procedure that often perversely serves as a waiver of patients' rights and an indemnification of the provider. Consented dupes have agreed to participate in a mock therapeutic process ostensibly intended for their benefit, but which in reality serves the interests of the provider. Importantly, by this use of 'consented,' I wish to emphasize that consent here is a disadvantageous condition imposed on imperfectly informed subjects.

In stem cell soup transactions, the consented dupe makes a unilateral contribution while the perpetrator enjoys consequence-free profit. In the case of the stone soup fable, the villagers provide all of the necessary ingredients but are nonetheless ultimately satisfied with the results. For stem cell soup, the patient provides the cells and, crucially, the money. The "provider" provides little more than a narrative of attention and care and some display of *ex vivo* cell processing, generally of unknown effect or therapeutic utility.

A central irony of the autologous stem cell fable should be noted here. The provider markets the patient's own stem cells for their inherent and extraordinary therapeutic powers (e.g., homing to damage sites, broad-spectrum differentiation, release of paracrine factors and exosomes, system-wide immune effects). If the cells indeed achieved this range of healing effects, it raises the question of why they would need to be removed from the patient's body at all — could such cells not simply migrate to the target site and work their magic? This logical inconsistency notwithstanding, in the canonical version of the tale, patients happily pay to have their own cells extracted and reintroduced, while waiving all recourse and afterwards thanking the heroic "provider" for the service.

This points to a second, arguably more disturbing, set of latent features of stem cell soup as a medical narrative. In this reading, any benefits delivered by the provider are due not to the cells themselves, but to the medicine show they stage on the patient's behalf. Benedetti has noted that the "therapeutic ritual" is a key component in evoking the biopsychosocial effects collectively termed "placebo" [10]. Reliance on narrative-as-therapy is an expression of Voltairean medical nihilism, in which "The art of medicine consists of amusing the patient while nature cures the disease." In its extremest form, the advertising itself is therapeutic, as noted by Tomes in her history of medical advertising, where she cites an ad industry physician-consultant to the advertising industry who claimed, remarkably, that "We might even hope to make the reader feel better just from seeing our ad!" [11]. Thus, the role of the "provider" in the stem cell soup tale is not the delivery of cells, but of sales.

This dynamic dovetails with that of a second, arguably even more self-serving, key ingredient: the price tag. In the stone soup story, the villagers provide the ingredients, but can enjoy the soup for free; whereas in the stem cell variant patients not only provide the main ingredient, they must pay many thousands of dollars as well. Consistent with a reading in which the narrative itself is the therapy, proponents could argue that the charging of money is essential to maximizing its effect. One famous study reported that the placebo response scales with the purported monetary value of the intervention; i.e., individuals experience a stronger placebo when told that they have received an expensive drug, rather than a cheap one [12]. A stem cell soup "provider" may thus argue that for his healing tale to best succeed, he is compelled to price it dearly.

To recapitulate, in the stem cell variant of the stone soup folktale, the patient's cells serve as a clin-

ically inert prop in a production staged to "amuse the patient" while the combined forces of therapeutic ritual and overpricing elicit the strongest possible placebo response. In such business schemes, the patient is enlisted as an active collaborator, ensuring maximum buy-in and resistance to skeptical counter-narratives. While such soup-making is clearly a profitable business plan, it seems unlikely to serve as a recipe for actual progress in medicine.

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