C difficile—a rose by any other name…

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The twists and turns of bacterial taxonomy occasionally throw up complications for the infectious diseases community. Long established and familiar organisms are, from the perspective of many medical practitioners, suddenly renamed for what might seem to be arcane reasons that have little relevance to the management of disease. However, if a name change is hastily adopted by medical practitioners there is the potential for unintended consequences. For this reason, and a strong conservative instinct, taxonomic changes can take a while to filter through to medical practice. One such name change is to *Clostridioides difficile* from the familiar *Clostridium difficile*.

Clostridium difficile was reclassified in 2016 when it became necessary to assign *C difficile* to a new genus following the restriction of the genus to *Clostridium butyricum* and related species in 2015. When first discovered, *C difficile* was assigned to the genus *Clostridium* because of broad phenotypical similarities with other members: it was an anaerobic, Gram-positive, spore-forming rod. Subsequent studies using molecular methods revealed the diversity of organisms that were, at that stage, considered a single genus. The crucial complication came when analyses showed that *C difficile* should be included in the family Peptostreptococcaceae. This prompted the suggestion that *C difficile* be assigned to a new genus: *Peptoclostridium*.

However, moving to *Peptoclostridium difficile* was not straightforward. *C difficile* is a very familiar name with recognition that extends beyond medical practice, and, given this broad recognition, it has been widely used in many commercial products. So, in addition to the medical impact, drastically changing its name would have led to a significant financial burden in terms of relabelling etc. The solution was to create a new genus that was sufficiently similar to *Clostridium* to minimise any confusion. This involved creating a genus that began with the letter C, so relevant abbreviations remained unchanged; the second step was to retain some of the spelling of the old genus so future accounting for the difference was less urgent. Consequently, *Clostridioides* was coined.

The US Centers for Disease Control and Prevention has recently adopted the new name following the Clinical Laboratory and Standards Institute's adoption of the name a year earlier. Given this high-profile acceptance, it seems logical for its use to move into the mainstream to ensure consistent nomenclature. There is no way to really coerce people into adopting the new name, but medicine is a field in which inconsistently applied terminology can create real risks. Although, in this case, the carefully thought out name change will probably minimise misunderstandings even if both names continue to be used interchangeably for the time being.

A more recent example of renaming of clinically relevant bacteria is a proposal that two members of the *Staphylococcus aureus* complex be given species names. *Staphylococcus argenteus* and *Staphylococcus schwietzeri* are the proposed names following whole-genome sequencing that identified members of the *S aureus* complex that were sufficiently different to *S aureus* to be considered their own species. Ultimately, this differentiated taxonomy might prove clinically useful: *S argenteus* seems to cause disease similar to *S aureus*, whereas *S schwietzeri* has not been reported as a cause of infection. However, this change differs from the *C difficile* example because current proposals do not recommend that these species be distinguished for routine reporting purposes until there is evidence of clinically meaningful differences.

In 2007, a Comment in *The Lancet Infectious Diseases* laid out the case for using *Pneumocystis jirovecii* as the cause of pneumocystis pneumonia, rather than *Pneumocystis carinii*. The opening sentence stated that "the purpose of scientific names of organisms is unambiguous communication". This continues to be true; however, while consistent nomenclature is desirable, it need not immediately extend beyond the boundaries of the basic sciences. The implications of new names to the practice of medicine need to be carefully weighed up. Sometimes, as with the creation of *Clostridioides*, it is necessary to carefully engineer an appropriate name. On other occasions, as with *S argenteus* and *S schwietzeri*, it might be appropriate to limit the names to non-medical applications.

Given that there has been appropriate consideration of the implications of the name change, henceforth *Clostridioides difficile* will be the name used by this and other *Lancet* journals. ■ *The Lancet Infectious Diseases*

This online publication has been corrected. The corrected version first appeared at thelancet.com/infection on April 30, 2019

For more on the **restriction of the genus *Clostridium*** see *Int J Syst Evol Microbiol* 2016; **66:** 1009–16

For more on **reassignment to Peptostreptococcaceae** see *Environ Microbiol* 2013; **15:** 2631–41

For more on the **creation of the genus *Clostridioides*** see *Anaerobe* 2016; **40:** 95–99

For more on the **new *Staphylococcus* species** see *Clin Microbiol Infect* 2019; published online March 11. http://dx.doi.org/10.1016/j.anaerobe.2016.06.008

For more on ***Pneumocystis jirovecii*** see **Comment** *Lancet Infect Dis* 2007; **7:** 3–5