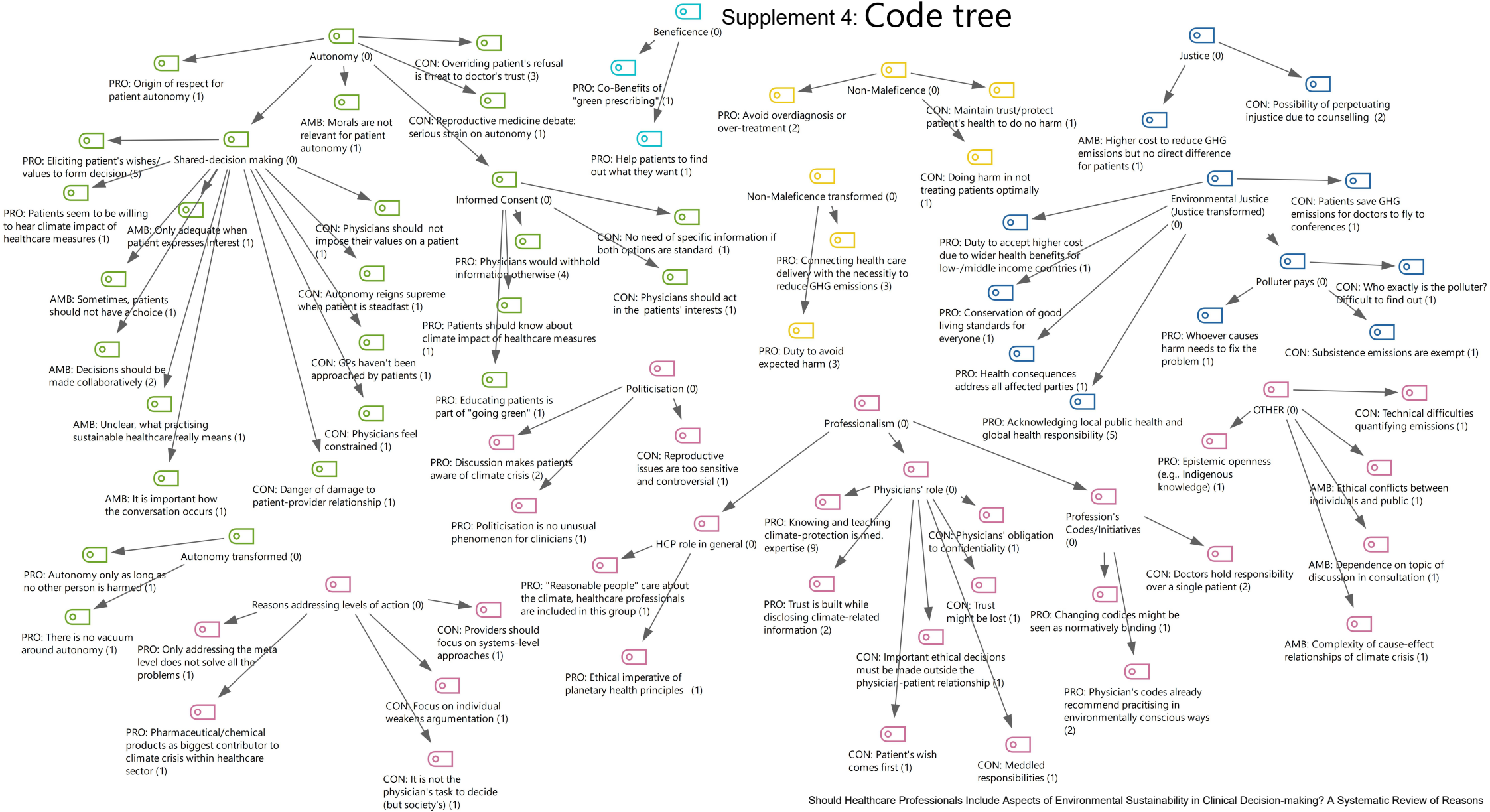Supplement 4: Code tree