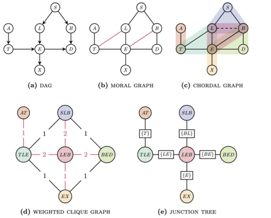

Figure 4.5: Transforming the ASIA DAG (Lauritzen and Spiegelhalter, 1988) into a junction tree, per Algorithm 2. We begin with the original DAG (**a**) and obtain the undirected moral graph (**b**). We then chordalize the moral graph to identify maximal cliques (**c**; chord denoted by a dashed edge; cliques in highlights). We transform the chordal graph into a weighted clique graph, where each node represents a maximal elimination clique and edge weights are assigned according to the cardinality of the sepset (**d**). From this, we can obtain the maximum weight spanning tree (pink edges). Finally, we have our junction tree (**e**).

Proposition 4.1. Any chordal graph has a corresponding junction tree. Furthermore, any graph with a junction tree must be chordal.

Proposition 4.2. Any chordal graph with n nodes has at most n maximal cliques. Further, the chordal graph with n nodes and n maximal cliques is the graph with no edges, and a connected chordal graph has at most $n-1$ maximal cliques.

For proof of Propositions 4.1 and 4.2, see Chapter 3 of Vandenberghe and Andersen (2015). Following from these observations, we can see