

## cond\_equiv\_to\_causl<sup>11,40</sup>

$\forall es:ES, R:(E \rightarrow E \rightarrow \mathbb{P}), P:(E \rightarrow \mathbb{P}).$

$R \Rightarrow \lambda e, e'. (e < e')$

$\Rightarrow (\forall x, y:E. (P(x) \& P(y)) \Rightarrow (((R(x,y)) \vee (x = y)) \vee (R(y,x))))$

$\Rightarrow (\forall x, y:E. (P(x) \& P(y)) \Rightarrow ((R(x,y)) \iff (x < y)))$