

EXPLORING THE CANDIDATE/DONOR COMPATIBILITY MATRIX TO IDENTIFY OPPORTUNITIES TO IMPROVE THE OPTN KPD PILOT PROGRAM'S PRIORITY POINT SCHEDULE

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BACKGROUND:

The OPTN Kidney Paired Donation Pilot Program (KPDPP) started running matches in October, 2010 and has facilitated over 100 transplants as of July 7, 2014. The program uses an “edgfinder” algorithm to identify edges, or donation possibilities, between candidates and ABO & alloantibody-compatible living donors in each match run. To prioritize candidates in a fair and transparent manner, an “edgeweigher” algorithm assigns committee-derived priority weights to each edge. Finally, an optimizer chooses the edges that comprise the optimal set of 2-way/3-way/chain exchanges. This analysis was performed to help the KPD Work Group refine how the algorithm prioritizes patients.

DATA AND METHODS:

Edgfinder output from 64 match runs (1/12-9/13) was used to derive edges per candidate and per pair statistics. Pairs were ranked by the product (“in” edges + 0.1) x (“out” edges + 0.1).

Fig 1: “In” versus “Out” Edges for Three Incompatible KPD Pairs

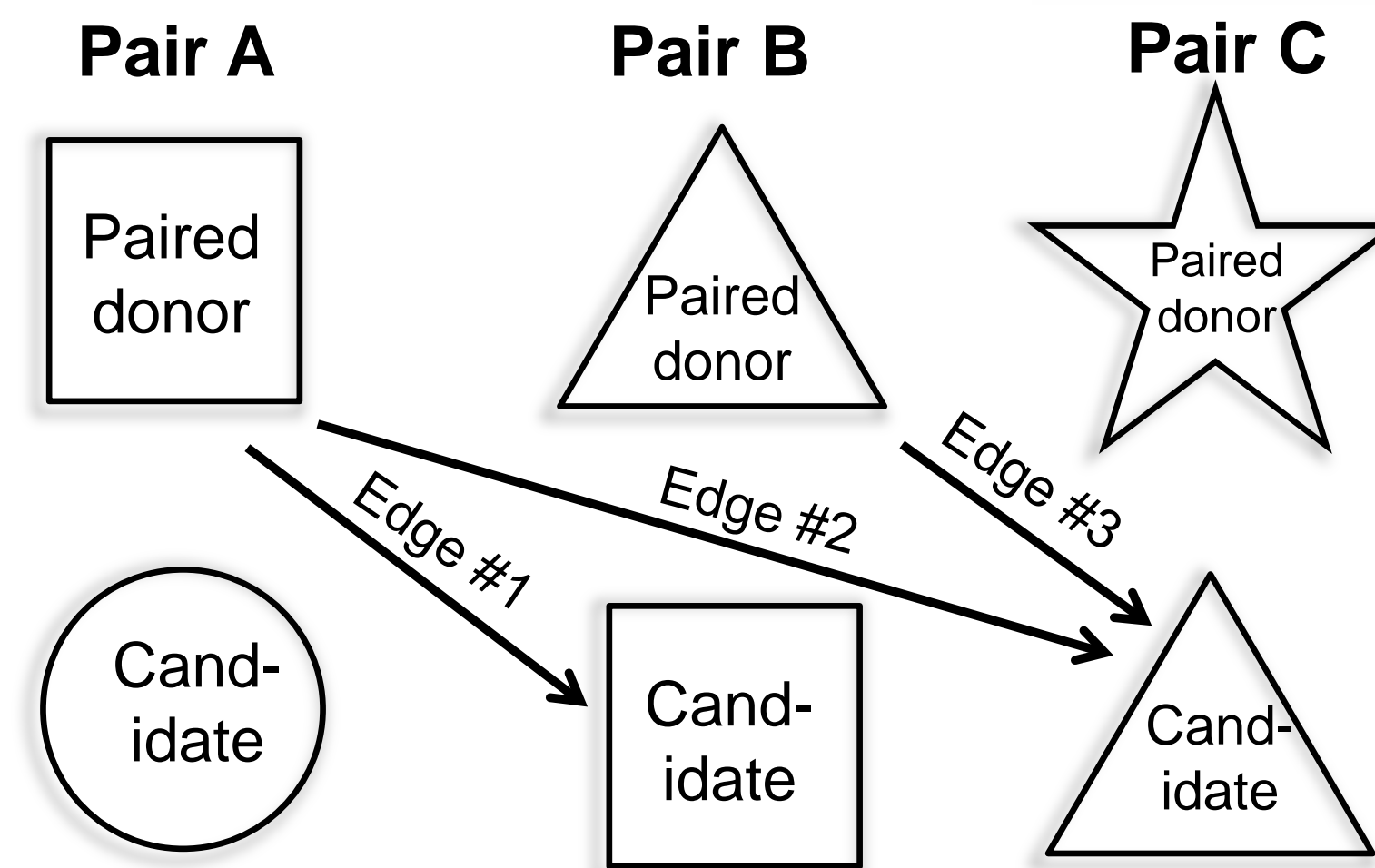


Figure 1 depicts the concept of “in” and “out” edges. Edges are drawn from donors to each biologically compatible candidate. Patient preferences (e.g., max donor age) also determine edges. In this hypothetical, 3-pair KPD pool, Pair A has two “out” edges but no “in” edges; Pair B has one “out” and one “in” edge; Pair C has zero “out,” two “in.” (Note: Figure 1 does not result in a 2 or 3-way exchange.)

RESULTS:

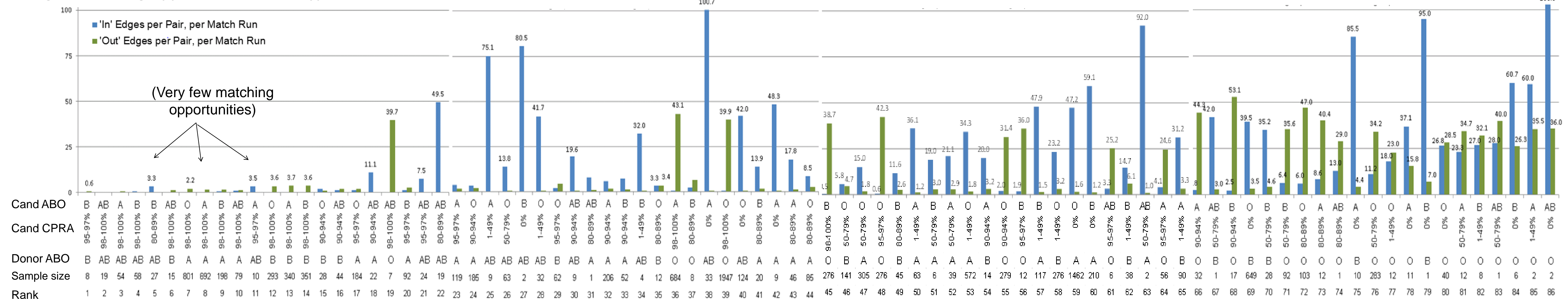
The average number of edges per candidate was dramatically lower for candidates with CPRA of 95%+ vs. 80-89%, revealing a highly nonlinear pattern. Candidates listed as willing to accept a shipped kidney, a kidney from a donor with a lower CrCl, or either laterality had more edges than candidates listed with tighter screening choices. Figure 2 shows that matching opportunities depend on characteristics of both candidates and their paired donors. Pairs toward the left of Figure 2 (e.g., ABO=A, CPRA=98-100%, donor ABO=AB) have fewer matching opportunities compared to pairs on the right. In addition, for every 100 pair increase in the pool, the # of edges per candidate rose by 10 (55%).

CONCLUSIONS:

Areas for refinement in the KPDPP’s prioritization schedule include

- Switching from 125 points for CPRA 80+ to a sliding scale
 - Incorporating blood type to prioritize candidates
 - Using characteristics of pairs, not just candidates
- Continued growth in the KPD pool size is anticipated to increase matching opportunities for all pairs.

Fig 2: Matching Opportunities for 86 Types of KPD Pairs



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