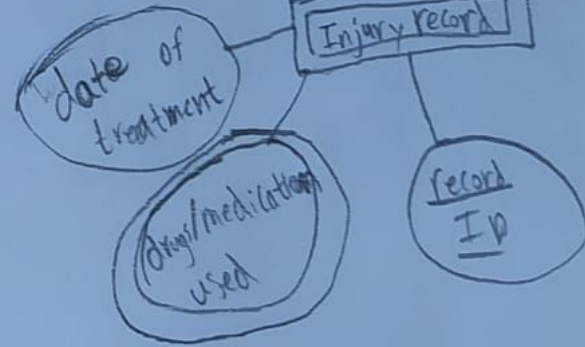- I assume injury record cannot be used as a primary key
- Player's skill may have more than one values
- Drugs used may number more than one
- Each team will only have one captain
- The coach will obviously train the team

Player

ID	Name	Position	Skill

Coach

ID	Name

Captain

ID	Name	Position	Skill

Team

ID	Name	City	Pnum		Coach In

Game

GID	Score	date	Tnum Home	Tnum Guest

Injury record

RID	PID	Drugs used	date

$R = \{A, B, C, D, E, F, G, H, I, J\}$

$= \{\{A, B\} \rightarrow \{C\}, \{A\} \rightarrow \{D, E\}, \{B\} \rightarrow \{F\}, \{E\} \rightarrow \{G, H\},$
$\{D\} \rightarrow \{I, J\}\}$

a) $A^+ = C\cancel{\emptyset} D E I J$ by reflexive
$\quad \hookrightarrow D^+ = \cancel{D} I J$ by transitive
$\{A\} \rightarrow \{E, J\}$ works

b) $A^+ = \cancel{A} C D E I J$, not a super
$\quad B^+ = \cancel{B} C F G H$, Not a super
$\quad \quad \hookrightarrow F^+ = \cancel{F} G H$
$\quad C^+ = \cancel{C}$ Not a super

$\quad ABC^+ = ABCDEIJ$, Is a super

$\quad \therefore \{ABC\}$ is a candidate key, not a superkey

c) $A^+ = ACDEIJ$, Not a super
$\quad F^+ = \cancel{F} GH$, Not a super
$\quad AF^+ = ACDEFGHIJ$, Not a super
$\quad \therefore \{A, F\}$ Not a super and not candidate key

d) ~~R = {A B C D I J}~~ ~~R_2 = {A B C D E G F C I J}~~

$R = $ ~~{A B F G H}~~

~~F~~

~~θ~~

$R_1 = \{A, B, C\}$ $\quad A^+ = A \cancel{B} C D E I J$
$\quad \quad \quad \quad \quad \quad \quad B^+ = C \cancel{E} F G H$
~~R_1 = E~~ $\quad \quad \quad \quad \quad \quad C^+ = C$
$\quad \quad \quad \quad \quad \quad \quad \quad \quad D^+ = IJ$
$R_2 = \{A, D, E, I, J\}$ ~~D~~$A \quad F^+ = \{GH\}$
$\quad \quad R_3 = \{B, F, G, H\}$

$\quad \therefore R_1, R_2, R_3,$ only has One Superkey each and
$\quad \quad$ no partial dependencies

e) $R_{2a} = \{ B, F \}$ $\quad\quad\quad\quad$ $B \rightarrow F \rightarrow G H$

$\quad\quad R_{2b} = \{ F, G, H \}$

$\quad\quad\quad R_{3a} = \{ A, D, E \}$ $\quad\quad$ $A \rightarrow D \rightarrow I J$

$\quad\quad\quad\quad R_{3b} = \{ D, I, J \}$ $\quad\quad$ $E \rightarrow \emptyset$