The generator starts to iterate between 1 and the total number of days $days$ required to simulate. Within the iterator initialized the patient list ($list\_patients$) and assigns the number of patients (pat_day) to be schedule on the current day d. This number is randomly generated in a range from 0 to the maximum number ($total\_pat$) entered as parameter.

Then begin iterating from 1 to the number newly generated pat_day. It initializes the new patient $new\_patient$, together with the optimal day $begin$ to start the treatment, this number varies between 1 and gap, to this is added the day d. Subsequently determines the type of patient based on the odds (p_eme, p_pal, p_rad. Where $p\_eme + p\_pal + p\_rad = 1$), where as applicable, will be assigned the number of treatments ($treatments$). Additionally, we calculate the last day were could begin the treatment ($begin + [last\_eme, last\_pal, last\_rad]$) . After calculate the number of interruptions ($interruption$) it can have on treatment, if do not want to have interruptions, just set $prob\_int = 0$. Depending on the category determined for the patient, the machine is assigned, by means of odds ($machines\_eme, machines\_pal, machines\_rad$) entered.

Finally, assign the values to the new patient ($new\_patient$) which is inserted into the list $list\_patients[d]$ on the corresponding day, which is organized by category.

Parameter	Description
$days$	Number of days to simulate
$total\_pat$	Maximum number of patients that can be scheduled in a single day
p_eme	Percentage of emergency patients to simulate
p_pal	Percentage of palliative patients to simulate
p_rad	Percentage of radical patients to simulate
$prob\_int_i$	Maximum percentage of all sessions assigned to the patient that may have interruptions in the
$time$	Machine time available per day
$time\_session$	Duration of treatment in patients
$first\_time$	Additional time to treatment in the first session
$delay\_eme$	Extra delay at the beginning where may begin the treatment for emergency patients
$delay\_pal$	Extra delay at the beginning where may begin the treatment for palliative patients
$delay\_rad$	Extra delay at the beginning where may begin the treatment for radical patients
$groups\_eme$	Number of types of treatments that the patient categorized emergency may have
$groups\_pal$	Number of types of treatments that the patient categorized paliative may have
$groups\_rad$	Number of types of treatments that the patient categorized radical may have
ses_eme	Vector that contain the number of treatments for the type of treatment needed for the patients
ses_pal	Vector that contain the number of treatments for the type of treatment needed for the patients
ses_rad	Vector that contain the number of treatments for the type of treatment needed for the patients
$prob\_ses\_eme$	Vector that contain the probability of occurrence of the differents types of treatments for the pa
$prob\_ses\_pal$	Vector that contain the probability of occurrence of the differents types of treatments for the pa
$prob\_ses\_rad$	Vector that contain the probability of occurrence of the differents types of treatments for the pa
n_mach	Number of types of machines available
$machines\_eme$	Vector that contain the probability of being assigned for a type of machine for the patients cate
$machines\_pal$	Vector that contain the probability of being assigned for a type of machine for the patients cate
$machines\_rad$	Vector that contain the probability of being assigned for a type of machine for the patients cate

Algorithm 1 Generator

```
procedure GENERATOR
Input: days, total_pat, prob_int, time, p_eme, p_pal, p_rad groups_eme, delay_eme, delay_pal,
    delay_rad groups_pal, groups_rad, ses_eme, ses_pal, ses_rad, prob_ses_eme, prob_ses_pal,
    prob_ses_rad, n_mach, machines_eme, machines_pal, machines_rad
    for $d := 1$ do $days$
        $list\_patients \leftarrow NULL$
        $pat\_day \leftarrow random(0, total\_pat)$
        for $p := 1$ do $pat\_day$
            $begin \leftarrow d + random(1, gap)$
            $r \leftarrow random(0, 1)$
            if $r \leq p\_eme$ then
                $type \leftarrow 1$
                $treatments \leftarrow sessions\_pat(r, groups\_eme, ses\_eme, prob\_ses\_eme)$
                $end \leftarrow begin + delay\_eme$
            else if $p \leq p\_eme + p\_pal$ then
                $type \leftarrow 2$
                $treatments \leftarrow sessions\_pat(r, groups\_pal, ses\_pal, prob\_ses\_pal)$
                $end \leftarrow begin + delay\_pal$
            else
                $type \leftarrow 3$
                $treatments \leftarrow sessions\_pat(r, groups\_rad, ses\_rad, prob\_ses\_rad)$
                $end \leftarrow begin + delay\_rad$
            end if
            $interruption \leftarrow random(0, prob\_int * treatments)$
            $machine \leftarrow 0$
            $r \leftarrow random(0, 1)$
            if $type = 1$ then
                $machine \leftarrow set\_machine(r, n\_mach, machines\_eme)$
            else if $type = 2$ then
                $machine \leftarrow set\_machine(r, n\_mach, machines\_pal)$
            else if $type = 3$ then
                $machine \leftarrow set\_machine(r, n\_mach, machines\_rad)$
            end if

            $new\_patient \leftarrow type, begin, end, interruption, treatments, machine, time\_session, first\_time$
            $list\_patients[d] \leftarrow new\_patient$
            $order\_patients\_category(list\_patients[d])$
        end for
        return $days$, $n\_mach$, $list\_patients$, $time$
    end for
end procedure
```