ISSN: 2755-015X

Journal of Surgery & Anesthesia Research

SCIENTIFIC Research and Community

Research Article

Open Access

Fast-Track in Elderly Patients Over 60 Years of Age Undergoing Hip and Femur Procedures in a Four Hospital of the Brazilian Health System (SUS) Study Between 2010 and 2022

Luiz Eduardo Imbelloni[1]*, Anna Lúcia Calaça Rivoli[2], Sylvio Valença de Lemos Neto[3], Thaís Bezerra Ventura[4], Siddharta Lacerda[5], Antonio Fernando Carneiro[6], Nathalia Bufaiçal Rassi Carneiro[7], Maria Carolina Padovani Guerra[8] and Geraldo Borges de Morais[9]

[1]Anesthesiologist of Complexo Hospitalar Mangabeira, João Pessoa, PB

[2]Anesthesiologist at the National Cancer Institute (INCA)

[3]Head of the Anesthesiology Service of the National Cancer Institute (INCA) Anesthesiologist, Responsible for the CET-SBA of the National Cancer Institute, Rio de Janeiro, RJ, Brazil

[4]Anesthesiologist of Hospital Regional Wenceslaw Lopes, Piancó, PB, Brazil

[5]Anesthesiologist of Hospital da Santa Clara, Campina Grande, PB, Brazil

[6]Professor of Anesthesiology at the UFG Faculty of Medicine, Responsible for the CET-SBA of the HCUFG, Goiânia, GO, Brazil

[7]Graduated from Pontifical Catholic University of Goiás, Brazil. Fellowship in Integrative Medicine at the University of Arizona, USA

[8]Resident in Anesthesiology and Pediatrics

[9]Master's in Labor Economics, UFPB, João Pessoa-PB, PhD Student in Applied Mathematics and Modeling, Universidade Aberta de Lisboa, Portugal

ABSTRACT

Background: The Fast Track Surgery (FTS) refers to all phases of perioperative care: preoperative, intraoperative, and postoperative strategies. Although most research has focused on adherence to medication, adherence also encompasses numerous health related behaviors. The main objective of this study was to compare the FTS in elderly individuals over 60 years of age with femur and hip fractures with the hospital's routine conduct. The second objective was to compare the groups of each decade after 60 years of age. And the third objective was to assess with orthopedists and anesthesiologists whether they changed their conduct after participating in the FTS.

Methods: After evaluating 105 patients undergoing the hospital's usual protocol analgesia with morphine and ICU, it was compared with 1793 patients undergoing FTS, with patients underwent spinal anesthesia with postoperative analgesia by lumbar plexus block and no ICU. The FTS protocol was evaluated in three stages: during the pre-anesthetic visit until arrival in the OR, during the surgical procedure until discharge from the PACU, and finally during the infirmary and hospital discharge. The costs of the procedures were not evaluated. Finally, the adherence of professionals to the FTS was assessed.

Results: All departments involved in the treatment of elderly patients adhered completely to the project and reported the importance of preanesthetic visit, the explanations of design, and reduction of fasting period. Just one anesthetist completely adhered to the project. Some parameters were not evaluated in the group before the project, so they were not compared, but rather evaluated after the implementation of the FTS. For analgesia, lumbar plexus blockade was used before the procedure in 998 patients and after surgery in 795 patients, with an average duration of 22 hours. All parameters studied in 1793 patients compared with the data before the project showed a reduction from 62% to 83%.

Conclusion: In four Brazilian Health System (SUS) hospitals, high adherence by virtually all health services is an excellent stimulant for the implementation of any new procedure. However, low adherence by older anesthesiologists and new anesthesiologists completing their residencies may prevent the project from being extended to all patients. There is a great need for health managers in the Brazilian Health System to embrace and implement any new service, especially if it generates savings.

***Corresponding author**

Luiz Eduardo Imbelloni, Researcher without Institution, Anesthesiologist at various Hospitals, Rio de Janeiro, RJ, Brazil.

Received: July 22, 2025; **Accepted:** July 29, 2025; **Published:** August 05, 2025

Keywords: Fasting, Fast Track Surgery, Medical Adherence, Orthopedic, Perioperative Care, Spinal Anesthesia, Surgery

CHM: Complexo Hospitalar Mangabeira, João Pessoa, PB
HTOP: Hospital de Traumatologia da Paraíba, João Pessoa, PB
HEET: Hospital Estadual de Emergência e Trauma, João Pessoa, PB
HCM: Hospital Clínicas Municipal, São Bernardo do Campo, SP

Introduction

In July 2010, I decided to leave the way I worked, working 100% in a private clinic in Rio de Janeiro, to take on the challenge of working exclusively in the Brazilian Unified System (SUS) for nine years in João Pessoa, PB (CHM, HTOP, HEET) and three years in São Bernardo do Campo, SP (HCM). This was an extremely drastic but challenging change in the way I worked, moving from working in a private clinic to working in public health hospitals. A path that is normally the opposite of most anesthesiologists but extremely rewarding for my development as an anesthesiologist and researcher.

Accessing the website of the Brazilian Institute of Geography and Statistics (IBGE), it was revealed that Brazil will have 35 million people aged 60 or over in 2025, which represents 16% of the population (Figure 1) [2]. According to the IBGE, the number of elderly people over 60 years old in Paraíba increased by 79% in the 2022 census, reaching 615,328 elderly people, with 11.5% of its inhabitants aged 65 or over, occupying the 7th national position [2]. Using the same access, the 2022 census showed aspects of the population of São Bernardo do Campo, that residents aged 60 or over represent 19% of the inhabitants, that is, around 154,670 people [2]. By 2070, this portion of the population is expected to triple, reaching 31.3%, according to the IBGE.

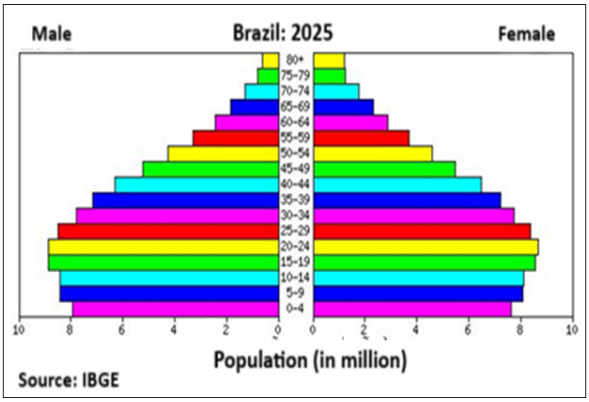

Figure 1: Brazil's Age Pyramid in 2025 [2]

With the aim of analyzing the epidemiological profile of femur fractures in Brazil from 2019 to 2023, through DATASUS, it was shown that they represent a significant challenge for public health, with high hospitalization rates, with the southeast region being the most affected, women, brown race and over 80 years old [3]. In another study using the DATASUS system to assess the profile of femur fractures in elderly people in Brazil from 2008 to 2018, 480,652 hospitalizations of people aged 60 and over with hip fractures were included [4]. The results showed a 76.9% increase in hospitalizations with an average incidence of 19.46 fractures for every 10,000 elderly people, with an average length of stay of 8.9 days, with the lowest cost in the northeast region and the highest in the southeast region [4].

Comparatively analyzing hospitalizations due to femur fracture in patients aged 60 years or older in Brazil between 2013 and 2022 with SUS patients, 568,367 elderly people suffered femur fracture, concluding that there was an increase in hospitalizations due to femur fractures in elderly people in Brazil in the period studied, except for the year 2020 (Covid pandemic), with higher total numbers of occurrences in the southeast region of the country [5].

The main objective of this study was to evaluate the clinical results 2010 a 2022 in four hospitals of the Brazilian Health System (SUS), with the implementation of a Fast-Track Surgery (FTS) in patients over 60 years old who underwent femur and hip fractures, comparing it with the technique routinely used in hospitals before implementation, for possible modification. As a secondary objective, compare all parameters studied between each group of 10 years of age after 60 years after implementing the FTS. As a third objective, it was evaluated with anesthesiologists and orthopedist who work with elderly patients with femur and hip fractures, having as conduct the FTS, maintaining the technical conduct learned or modifying their conduct, returning to the routine of the other staffs.

Methods

The study was carried out for 12 years, with all patients who underwent corrective operations for femur and hip fractures aged over 60 years. The protocol was registered on Plataforma Brasil (CAAE: 09061312.1.0000.5179) and was approved by the Research Ethics Committee (Number 171,924). During the evaluation of the hospitals' usual technique, patients were visited by the orthopedics and anesthesia services and, subsequently, with a guaranteed place in the Intensive Care Unit (ICU), the patients were operated on under anesthesia by the hospital group for later comparison with the implementation of FTS in these patients.

To study the implementation of the fast-trach project in elderly patients with femur fractures, two Excel spreadsheets were created. The first Excel spreadsheet, horizontal (Figure 2), was used to collect data from all patients during the three phases of the study. The second Excel spreadsheet, vertical, was used for collection during hospitalization and evaluation. On the back, the Free and Informed Consent Form was signed by the patient or their family members.

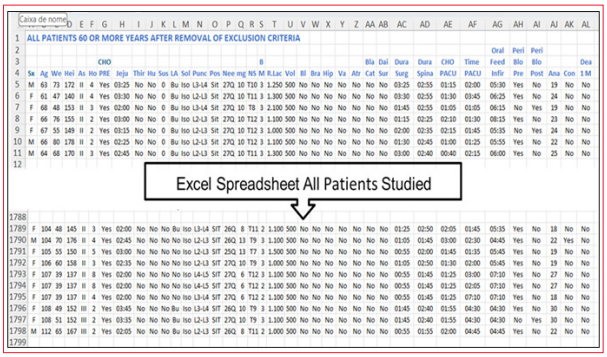

Figure 2: Excel Spreadsheet with All Patients Parameters from First to Last 1793

The implementation of the project was proposed at the hospital, after five meetings with all hospital services to familiarize themselves with the fast-track technique. The main reason for the implementation was that the hospital was open and only has only had eight ICU beds, and the anesthetists required that the ICU bed be reserved for referral to the operating room (Table I). It was determined that there would be no suspension of procedures after evaluation by the geriatrician, orthopedic and anesthesiology services. There would only be suspension in the event of a lack of material for the surgical procedure, and after the material arrived

the patient would be operated on and would not be counted as suspension of surgery (Table I). Anesthesia prior to the implementation of the project was performed in accordance with the conduct of the anesthetists (Table I).

Table I: Anesthetic approaches in Orthopedic Surgery of Femur or Hip Before and After Implementation of the Project Fast-Track

Convencional Protocol in Elderly Orthopedic Surgery	Fast-Track Protocol in Elderly Orthopedic Surgery
• Surgery with ICU reservation • Preoperative fasting from 20 h (since last night) • Assessment of hunger and thirst • 0.5% hyperbaric bupivacaine 15 or 20 mg • Spinal anesthesia in sitting position • Zero diet 22h until the morning of day one postoperatively • Intravenous hydration in the first 24 h • Return to oral feeding day one after surgery • Use of drains as surgeon preference • Use bladder catheter in all patients • Analgesia morphine intrathecal • Without evaluation duration of analgesia • Discharged only after ICU release	• Length of hospital stay until OR • Hemoglobin > 10g% • Surgery suspension lack of surgical material • Surgery after material arrival • CHO 2-4h prior to surgery • Assessment of hunger and thirst in OR • Isobaric 0.5% bupivacaine or 0.5% S75:R25 6 to 15mg • CHO after termination of motor block in the PACU • No intravenous hydration postoperatively in infirmary • Venous injection medication salinized • Time reintroduction of oral diet free in infirmary • No use of bladder catheter during surgery • No use of drains after surgery • Analgesia lumbar plexus block pre or postoperative • Duration of analgesia • Discharge condition in the 1st postoperative day or more

To implement the FTS, all patients were visited by the anesthesiologist coordinating the project and the 2nd and 3rd year residents, and the project was detailed explained to the patient and family, and all the parameters evaluated are in the implementation process. very stage of the project was shown to the anesthetists who were at the hospital on the day of each surgery, to ensure they could adhere to the new way of caring for elderly patients.

All elderly patients with a femoral or hip fracture who were admitted to the hospital and all patients normovolemic, without neurological disease, without coagulation disorders, without infection at the lumbar puncture site between L2 and L5, who did not present agitation and/or delirium, did not use an indwelling urinary catheter, with a hemoglobin level >10g/dL who were anesthetized under spinal anesthesia without opioids and lumbar plexus block for analgesia and who were not admitted to the ICU, without using a catheter in the bladder or drain in the surgical incision.

The use of spinal anesthesia with puncture in sitting or lateral decubitus and with a pencil point needle or cut point needle, and 0.5% isobaric bupivacaine or levobupivacaine (S75:R25), not being hospitalized in the ICU. The exclusion criterion undergoing Continuous Spinal Anesthesia (CSA), Combined Epidural Spinal Anesthesia (CESA), fracture of the femur or hip under the age of 60, coagulation disorders, need for blood replacement and hospitalization in the ICU.

The hospital did not have Magnetic Resonance Imaging (MRI) or equipment to perform echocardiography. Thus, the elderly were evaluated jointly by a geriatrician, by the anesthesiologist responsible for the implementation of the fast-track project and by an orthopedist and communicated to the patient and family members. All orthopedists were trained and at the beginning of the project there were residents in orthopedics, however, the surgeries would be performed by the orthopedic staff. Delirium was diagnosed by a geriatrician who evaluated the patient and released him for surgery and before hospital discharge.

Patients included in the study received the day before the operation, 200mL of maltodextrin (CHO) 2 to 4 hours before being referred to the OR. The surgeries would be performed until 2 pm and they would remain in the post-anesthetic recovery room (PACU) until the end of the block, when they were again given 200mL of maltodextrin. After 30 to 60 minutes, if the patients accepted oral feeding without nausea or vomiting, they were referred to the ward, without intravenous hydration and with free diet released in the ward. Patients remained with a venous catheter saline for injection of antibiotics, analgesics and other intravenous medications.

All patients of the project implementation were carried out in accordance with the conduct proposed in the five meetings, with orthopedists, residents, staff, social services, nursing services, nutrition services and hospital management received standard anesthesia (Table I). No preanesthetic medication was administered in the ward. After venoclysis with a 20G or 18G catheter, infusion of Ringer's solution with lactate was started in parallel with 6% hydroethyl starch. Cefazolin administered 2g and 10mg intravenous dexamethasone. Monitoring in the operating room was performed by continuous ECG in the CM5 position, blood pressure by a non-invasive method and pulse oximetry and capnography by nasal catheter, and no patient was used bladder catheterization.

After sedation with intravenous ketamine (0.1mg/kg) and midazolam (0.5 to 1mg) and skin cleansing with alcoholic chlorhexidine or alcohol 70%, spinal puncture was performed with the patient in the sitting position or lateral decubitus, through the median or paramedian route in the interspaces. L2-L3, L3-L4, L4-L5 after skin infiltration with 1% lidocaine, using 25G, 26G or 27G Quincke needle without introducer or 27G Whitacre needle with introducer. After the appearance of cerebrospinal fluid (CSF) confirming the correct position of the needle, a dose of 0.5% isobaric bupivacaine or levobupivacaine were administered at a rate of 1mL/15s. Patients were immediately placed in the supine position to start the operation. Hypotension (SBP decrease > 30% of ward pressure) was treated with ethylephrine (2mg venous) while bradycardia (HR < 50bpm) was treated with atropine (0.50mg venous). At the end of the operation, the patients received tenoxicam 40mg and dipyrone 40mg/kg in 50mL of Ringer with lactate.

Postoperative analgesia was performed using anterior (inguinal) or posterior (psoas compartment) lumbar plexus block. In patients

scheduled for the first time, the block was performed before spinal anesthesia in the PACU and, in the others, at the end of the surgical procedure in the OR. Blockade was performed with a 50mm (anterior = inguinal) or 100mm (posterior = psoas compartment) needle connected to a peripheral nerve stimulator (HNS 12 Stimuplex®, B. Braun Melsungen AG) regulated to release a square pulsatile current of 0.5mA, with a frequency of 2Hz, seeking to obtain contraction of the quadriceps femoris muscle. Once the desired contraction was achieved, 20mL of 0.5% enantiomeric excess levobupivacaine with 20mL of 2% lidocaine with epinephrine were injected into the block performed before the operation or 40mL of 0.25% enantiomeric excess levobupivacaine at the end of the operation. In some patients, a catheter and elastomeric pump were placed for 40 hours of analgesia. The CHM did not have an ultrasound device for performing peripheral nerve blocks.

Analgesia was evaluated by the needle prick and cold test to determine the extent of sensory block in the anterior thigh region (quadriceps femoris muscle) after the block was completed in the PACU and on the morning after the operation in the ward. The moment of the first painful complaint was noted. Patients were transferred to the room without venous hydration, with a saline venous catheter and received dipyrone 1g 6/6 h and cefazolin 1g 6/6 h.

The evaluation of data and recording in the Excel spreadsheet was performed at four moments of the study: 1st) Before arrival at the operating room: a) time of hospitalization until the date of the operation, b) fasting time; 2nd) During the surgical procedure: a) dose of anesthetic used, b) volume replacement with Ringer's lactate and 6% hydroethyl starch, c) need for blood replacement, d) hypotension arterial blood pressure and correction with ethilephryne, e) bradycardia and correction with atropine, f) surgical time (from venoclysis to the end of the operation); 3rd) In the PACU: a) blocking time (end of motor block), b) food reintroduction time (completion of the operation until oral maltodextrin), c) length of stay in the PACU (completion of the operation until high of the PACU), d) feeding time (end of operation to oral feeding in the ward), e) incidence of nausea and vomiting; 4th) In the ward on the morning of the first postoperative day: a) duration of analgesia provided by the block, b) food acceptability oral and time for the first meal, c) need of the use of a urinary catheter, d) mental confusion, e) need reintroduction of venous hydration, f) conditions of hospital discharge.

Statistical Analysis

Associations between categorical variables were assessed using Fisher's exact test and Pearson's chi-square test, depending on the adequacy of the assumptions. To compare quantitative variables between two groups, the Wilcoxon-Mann-Whitney test was used due to non-normality. In more than two groups, the Kruskal-Wallis test was used. A p-value <0.05 was considered significant.

Results

One thousand nine hundred and seventy patients over 60 years old were admitted to both sexes, with femur and hip fracture, after 177 patients were removed based on exclusion criteria, according to the consort flow diagram [Figure 3]. All parameters evaluated during the implementation of the fast-track project were compared with 105 patients in the hospital's routine anesthetic and surgical technique. Even when comparing 105 patients before with 1793 patients after FTS, there was no significant difference between demographic parameters.

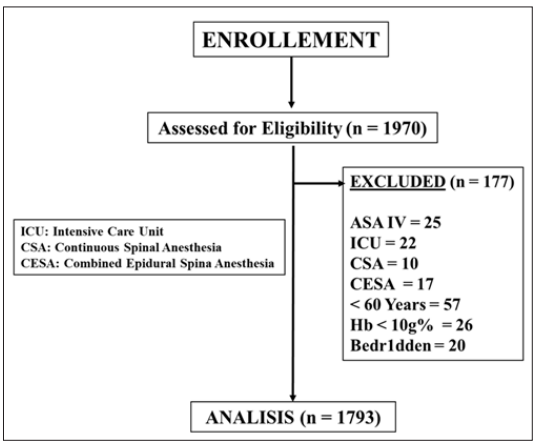

Figure 3: Consort Flow Diagram

One hundred and five patients, 67 (63.8%) female and 38 (36.2%) males, from the group studied with the routine practiced before the implementation of the project. In the post-implementation group, 1793 patients were studied, 1253 (70%) of whom were female and 540 (30%) were male. Demographic data comparing the 105 patients with the routine used in the hospital with the 1793 patients after implementation of the project, showing that there was no significant difference between demographic parameters in the two populations of elderly people over 60 years old (Table II).

Table II: Demographic Dates Before and After Fast-Track Implementation (m±SD)

Variables	Before = 105	After = 1793	p-Value
Age (y)	78.72±10.29	79.96±11.30	0.3392 *
Weight (kg)	62.59±12.06	63.09±11.16	0.7783 *
Height (cm)	158.14±9.81	158.45±9.39	0.7792 *
Gender: F / M	67 / 38	1253 / 540	0.1917 **
ASA physical status: I / II / III	5 / 81 / 19	95 / 1518 / 180	0.3239***

* Mann-Whitney - ** Fisher - *** Chi-square

Assessments before the project were not possible because all patients were referred to the ICU. The comparison of days hospitalized before surgery, the incidence of suspension, fasting time, incidence of thirst and hunger showed a significant difference when comparing the 105 patients in the routine used in the hospital with the 1793 patients after implementation of the project (Table III). All 1793 patients entered the project directly after its inception in the project, therefore without any suspension. Suspensions due to lack of material were not counted, as soon as the material entered the hospital the patient was taken to the OR. The mean length of hospital stay was 15.7 days (1 – 52 days), decreased significantly to 5.47 days (1 – 13 days), corresponding to a 65% decrease in the time before OR. Thirst (89.5%) and hunger (75%) were present in the control group, with the fasting period shortened from 14:16 hours to 2:52 hours, no patient presented thirst or hunger.

Table III: Days of Hospitalization, Number of Suspensions of Surgery, Time Fasting, Incidence of Hunger and Thirst

Variables	Before = 105	After = 1793	p-Value
Days of hospitalization (d) (minimum - maximum)	15.51±8.05 (6 – 52)	5.47±2.75 (1 – 13)	2.2e-16 *
Suspension surgery (m±SD)	No rated	Zero	-
Fasting time (h) (minimum - maximum)	14:16±1:45 (11 – 21)	2:52±0:31 (1:20 – 4:00)	2.2e-16 **
Hunger (Yes - %)	79 (75%)	Zero	2.2e-16 **
Thirst (Yes - %)	94 (89.5%)	Zero	2.2e-16 **

* Mann-Whitney - ** Fisher

The assessment of anesthesia and surgery before and after in OR, that many of the parameters evaluated during the implementation of the fast-track project were not part of the hospital's routine anesthetic and surgical technique (Table IV). However, the parameters evaluated showed a significant difference in all after the FTS conduct of elderly patients with femur and hip fractures (Table IV).

During the implementation of the project, several parameters were assessed in the PACU and infirmary when it was possible to compare, there was a significant difference in all of them. Delirium decreased significantly from 41 patients before FTS implementation to only 17 patients after project consolidation (Table V).

Table IV: Assessment of Anesthesia and Surgery Before and After in OR

Variables	Before = 105	After = 1793	p-Value
Anesthetic local	0.5% Bupi = 105	0.5% Bupi = 1609 0.5% Levo = 184	0.00002572 **
Solution	Hyperbaric=105	Isobaric = 1793	2.2e-16 **
Position puncture	SIT = 105 LLD = 0	SIT = 1599 LLD = 194	2.2e-16 **
Punction L2-L / L3-L4 / L4-L5 (n)	32 / 73 / 0	815 / 923 / 55	0.0007605 ***
Needle caliber 25G, 26G, 27G (n)	53Q / 24Q / 28Q 0W	244Q / 701Q / 691Q 157W	2.2e-16 ***
Dose LA (mg) (m±DP) (minimum – maximum)	16.33±2.21 (15 – 20)	9.58±1.79 (6 - 15)	2.2e-16 *
Nivel sensitive	T12 = 0 T11 = 3 T10 = 19 T9 = 33 T8 = 19 T7 = 15	T12 = 307 T11 = 483 T10 = 380 T9 = 366 T8 = 177 T7 = 62 T6 = 16 T5 = 2	0.00009999 ***

Motor block (Degre)	MB 3 = 105	MB 3 = 1762 MB 2 = 31	0.4126 **
Bradycardia (n - %)	22 (20.9%)	9 (0.5%)	2.2e-16 **
Atropine (n - %)	22 (20.9%)	9 (0.5%)	2.2e-16 **
Hypotension (n - %)	38 (36.1%)	95 (5.2%)	2.2e-16 **
Vasopressor (n - %)	38 (36.1%)	95 (5.2%)	2.2e-16 **
Blood OR (n - %)	30 (28.5%)	Zero	2.2e-16 **
Bladder catheter OR (n - %)	105	Zero	2.2e-16 **
Drain surgical OR (n - %)	60 (57.1%)	Zero	2.2e-16 **

* Mann-Whitney - ** Fisher - *** Chi-square

Bupi=Bupivacaine; Levo=S75:R25; Q=Quincke; W=Whitacre; SIT=Sitting,
LLD=Left lateral decubitus; MB=Motor bloc

Table V: Final Assessment Surgery, PACU and Infirmary

Variables	Before = 105	After = 1793	p-Value
Duration surgery (m±DP) h	02.19±00:43	01:52±00:34	1.398e-10 *
Duration anesthesia (m±DP) h	03:13±00:34	02:48±00:35	2.11e-11 *
Time CHO in PACU (m±DP) h	For ICU	01:41±00:46	-
Time in PACU (m±DP) h	For ICU	02:02±00:44	-
Time feeding in the ward h	For ICU	06:18±01:03	-
Delirium (n - %)	41 (39%)	17 (0.9%)	2.2e-16 **
Died in the 1st month (n - %)	16 (15,2%)	28 (1.5%)	2.2e-16 **

*** Mann-Whitney - ** Fisher**

The second stage of the study was to compare data across each decade of the patients. Demographic data for different age groups of patients and ASA in the different groups and their no significant difference (Table VI). All FTS patients immediately referred to PACU, where several parameters were evaluated. As soon as the motor blockade ended, all patients received 200ml of CHO (Figure 4). And were then referred to the infirmary, without intravenous hydration, and the time of food introduction through the mouth was around 6 hours (Table VII).

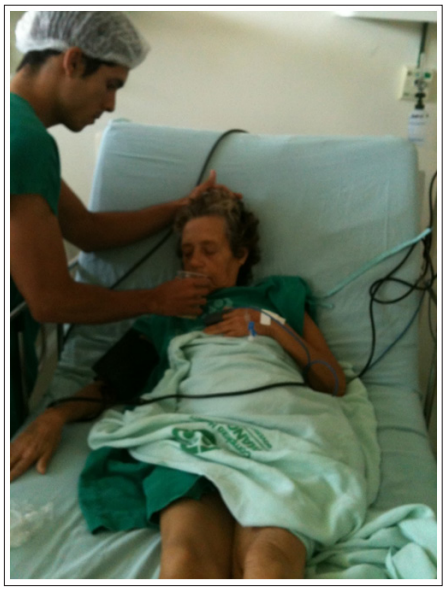

Figure 4: Patient Taking 200 ml CHO orally in PACU

All patients underwent spinal anesthesia there was no need for supplementation with general anesthesia, and the different types and gauges of needles were listed (Table IV). The average dose of 0.5% isobaric bupivacaine or S75:R25 levobupicaine was 9.63±1.86mg, with the lowest dose used being 6mg and the highest dose being 15mg. The cephalad dispersion varied between T12 and T5, in all patients, and the mode was the same T11 regardless of age group of patients. Complete motor block (grade 3) of the lower limbs occurred in 96.5% and only 3.5% grade 2 of FTS patients.

All patients received 500 mL of 6% hydroxyethyl starch 130/0.4 in 0.9% sodium chloride and Ringer with Lactate (1,208±285mL). Arterial hypotension occurred in 95 (5.2%) patients, and all hypotension were easily treated with only one dose of ethilephryne. Bradycardia occurred in only 9 patients (0.5%) easily treated with a 0.50mg dose of atropine (Table III). Parameters such as hospitalization, suspension, fasting time, thirst and hunger were significantly lower in the FTS group (Table III). The parameters evaluated at the end of surgery, PACU and infirmary were not possible to compare as many were not evaluated (Table V).

Comparisons of different patients in each decade of life after 60 years, no showed a significant difference (Table VI, VII, IX). A total of 998 lumbar plexus blocks were used before the surgical procedure and 795 after surgery. The duration of analgesia in the 1,793 patients was 22±4 hours, with no significant difference between age groups. It was not possible to compare with the group that received intrathecal morphine because this data was not computed. When possible and available in the hospital, a catheter was placed in the lumbar plexus and an elastomeric pump was used for analgesia for around 40 hours, and if the patient was discharged home, the catheter was removed by the anesthesia group. (Figure 5).

Figure 5: Patient with Catheter in the Psoas Compartment with Elastomeric Pump 0.1% Bupivacaine Lasting 40 Hours

Table VI: Demographics Dates After Fast-Track Project Implementation (m±SD)

Variables	60–69 Y	70–9 Y	80–89 Y	90–99 Y	100 or/+ Y	P-Value
Number	420	407	547	345	74	1793
Age (y)	64.41±2.76	75.30±2.78	83.99±2.54	93.21±2.52	102.24±2.32	-
Weight (kg)	63.55±10.0	63.61±10.19	64.14±12.25	61.17±10.59	58.82±14.44	0.000002309 *
Height (cm)	159.1±8.9	158.07±8.58	158.87±10.17	158.27±9.34	154.41±9.51	0.0072 *
Gender: F/M	262/158	303/104	397/150	227/118	64/10	0.00000593 **
ASA: I/ II/III	50/362/8	17/372/18	11/461/75	13/262/70	4/60/10	2.2e-16 **

*** Kruskal-Wallis - ** Fisher**

Table VII: Duration Fasting, Hunger, Thirst, Hospital Stay in OR

Variables	60-69 Y	70-79 Y	80–89 Y	90–99 Y	100 or/+ Y	P-Value
Number	420	407	547	345	74	1793
Fasting (h)	02:51±00:32	02:48±00:29	02:54±00:30	02:55±00:34	02:42±00:35	0.01342 *
Thirst (Yes)	0	0	0	0	0	0.5399 **
Hunger (Yes)	0	0	0	0	0	0.006463 **
Stay (day) (min-max)	6.03±2.8 (1 – 12)	5.54±2.76 (1 – 12)	5.8±2.8 (1 – 13)	5.6±2.4 (1 – 12)	4.5±2.4 (1 – 10)	0.000133 *

*** Kruskal-Wallis - **Fisher**

Table VIII: Duration of Surgery, Blocking Duration, Time to Feeding Dextrinomaltose in Pacu, Duration of Stay in the Pacu and Time of Oral Food Reintroduction on the ward (m ± SD)

Variables	60-69 Y	70-79 Y	80–89 Y	90–99 Y	100 or/+ Y	P-Value
Number	420	407	547	345	74	1793
Surgery (h)	01:55±00:34	01:52±00:29	01:57±00:37	01:48±00:31	01:28±00:30	3.112e-12 *
Spinal (h)	02:48±00:35	02:47±00:33	02:50±00:31	02:51±00:38	02:33±00:44	0.01578 *
CHO PACU (h)	01:30±00:39	01:34±00:35	01:42±00:47	01:54±00:58	02:04±00:42	2.371e-11 *
PACU stay (h)	01:57±00:41	02:00±00:41	02:07±00:46	02:00±00:43	02:19±00:57	0.0001278 *
Oral feeding (h)	06:30±01:00	06:15±01:02	06:13±01:03	06:18±01:09	06:08±01:01	0.001054 *

*** Kruskal-Wallis**

After being referred to the ward without intravenous hydration, none of the patients required hydration due to a drop in blood pressure and accepted oral feeding very well. Among the 1793 patients after the implementation of the FTS who were transferred from PACU directly to the ward, they were ready for hospital discharge on the first postoperative day. Hospital discharge for residency depended on the Hospital Social Service. All patients were able to go home in the morning after surgery (Figure 6). Only 28 patients died in the first month after surgery, compared to 16 before FTS.

Figure 6: Patients of 95 Years, Lumbar Plexus Analgesia and Discharged 18 Hours After Surgery, with his Daughter

Discussion

The elderly represent the fastest-growing population in the world and in Brazil 35 million people aged 60 or over (16%), and the SUS must be prepared for surgical treatment of femur and hip fractures in this population. FTS is a new surgical concept aiming at early ambulation, discharge, and return to activities of daily living, and it incorporates evidence-based care and other new developments to improve surgical outcomes. The implantation of the FTS for femur and hip in elderly more 60 years reduced the time spent in Hospital before the surgery, the time of pre-operative fasting, the number of canceled surgeries, the time spent in the PACU and the reintroduction of their meals in the infirmary. The quality of analgesia, immediate return to their meals with dextrinomaltose in 1:40 hours in the PACU and a free diet in 6:18 hours after surgery contributed to the chances in the protocol formerly used in the Hospital.

In a recent meta-analysis reveals that FTS could significantly shorten the length of stay, alleviate the pain, reduce the leave of bedtime and the hospitalization costs, and improve hip function [6]. The incidence of complications has also significantly decreased, meanwhile, FTS has been spoken highly to in patients in terms of nursing satisfaction [6]. Its efficacy and safety were proven to be reliable. In this study with FTS was performed on 1793 patients, 420 patients between 60-69, 407 patients between 70-79, 547 patients between 80-89, 345 patients between 90-99 and 74 between 100 and 112 years old, demonstrating that age should not be considered to postpone surgery immediately after admission to the hospital. The importance of having a multidisciplinary team such as geriatrician, anesthesiologist, orthopedist, social service, nursing, nutrition and physiotherapist accustomed to FTS treatment, performing sufficient exams to place the elderly in the OR. It is important to evaluate whether this elderly person had a normal life until the accident with femur and hip fracture, confirming the result of the recent meta-analysis [6].

The FTS refers to all phases of perioperative care: preoperative, intraoperative and postoperative strategies, and each stage had a significant decrease in the parameters evaluated [1-7]. In 1793 elderly patients, there was a 62% decrease in hospital stay and 83% in fasting time, without the use of urinary catheter, blood replacement, surgical drains, with feeding still in the PACU and hospital discharge on the 1st postoperative day.

The role of anesthesiologist is fundamental in the perioperative period, which includes preoperative, intraoperative and postoperative periods, making very important decisions to improve care [8]. The choice of anesthetic technique directly impacts patient satisfaction [9]. Therefore, the anesthesiologist should be seen as a very important part of the team and a key to the successful implementation of an FTS program in orthopedic surgeries of the femur and hip in the elderly population, avoiding the use of intrathecal morphine which increases the incidence of bladder catheterization.

The difficulties in implementing an acceleration project for elderly patients with femur and hip fractures may be due to a lack of knowledge or even a reluctance to introduce evidence-based concepts. In 2016, an assessment of the adherence of various services in implementing the FTS of 400 in elderly patients over 60 years of age showed that there was 100% adherence in the hospital administration, medical directors, orthopedic surgeons, geriatrics department, nutrition department, psychology department, nursing department, physiotherapy department, and social service department [10]. Among anesthesiology professionals, only one out of 20 adhered to the project, and of the former anesthesiology residents who started the project, none put it into practice when they began their professional activities [10].

Improving the adoption rate of any new project requires a continuous and dynamic process that cannot depend solely on the creator of any project. There must be a stronger commitment to a multidisciplinary approach that is essential to advancing new types of health projects, requiring coordinated actions by health professionals, researchers, health planners and policy makers in the SUS. To write this study from 2010 to 2022, I contacted some residents who participated in the implementation of the FTS for the elderly and several orthopedists to ask if their anesthesiologists had returned to the use of intrathecal morphine, urinary catheters and prolonged fasting. Most anesthesiologists returned to the old routine, but some orthopedists were categorical: I do not want morphine for my patients, I want a reduction in fasting, I do not want to use a bladder probe and surgical drain only with precise indication and finally without going to the ICU.

Adherence to any new project is a complex behavioral process determined by several interacting factors, including patient attributes, the patient environment, characteristics of the health system, functioning of the health team and the availability and accessibility of health resources, and characteristics of the disease in question and its treatment [11]. This study showed that all elderly patients with femur or hip fractures were included in the FTS project, and most departments involved in the care of the elderly joined the project, except for anesthesiology staff and former anesthesiology residents. Orthopedists began to demand this treatment in private practice patients.

During admission for a femur and hip fracture, delirium is the most frequent complication with high incidence rates, is associated with an increased level of impaired cognitive and less functional recovery, with an extended admission duration, higher treatment costs and increased mortality rates [12]. Performing FTS in elderly patients with femur and hip fractures, with reduced fasting, no use of morphine, no placement of a catheter in the bladder, improved analgesia by plexus blockade before or after surgery, use of CHO in the PACU, immediate discharge to the hospital with family members, early reintroduction of food and discharge on the first postoperative day, contributed to the reduction of delirium in patients.

In a retrospective cohort study published in 2023 with 788 patients admitted with a femoral neck or intertrochanteric fracture, the analysis of 1-month mortality showed a significant mortality difference in patients operated after 48 hours of fracture and in patients with ASA scores of 3-4 compared to ASA scores of 1-2 [13].

One of the main objectives of FTS in patients with femur and hip fractures was to shorten fasting, avoid the use of ICU, and avoid the use of subarachnoid morphine for analgesia in this group of patients. Intrathecal opioids are highly effective in the management of post-operative pain. The technique is simple with a very low risk of technical failure or complications, and it does not require additional training or expensive equipment such as ultrasound machines and, therefore, is widely practiced around the world. The intrathecal morphine is routinely used in spinal anesthesia for postoperative pain control in more than 600 cases per month with doses lower than 0.3 mg, however it showed the incidence of side effects is high (nausea 21.5%, vomiting 14.8%, pruritus 59.5%) [14]. Nerve blocks should be used routinely to help pre-operative pain or postoperative pain in proximal femoral or hip fracture patients and to reduce the amount of morphine products prescribed [10]. In this study, after implementation of FST, morphine was not used in any patient, either in the preoperative or postoperative period, which was achieved with lumbar plexus blockade.

In this study with 1793 patients over 60 years old with femur and hip fractures there was a decrease from 62% to 83% in all studied parameters it can be inferred that the implementation of FTS in SUS hospitals costs decreased with elderly patients with femur and hip fractures. The implementation of FTS in SUS hospitals should be an objective of municipal, state and federal governments in Brazil.

Financial Support: No

Conflict of Interest: No

Contribution: No

IRB: No

Conclusion

In this study with 1793 patients over 60 years old with femur or hip fracture, both age (79.96±11.30 years) and ASA physical status (I=5.3%, II=84.7%, III=10%) were not reasons for implementing the fast-track project in SUS hospitals, where resources are important in the treatment of elderly people who already represent 16% of the population (35 million people aged 60 or over) of the Brazilian population in 2025. Although the costs of the two approach methods were not evaluated, given the reduction in all the parameters evaluated, the cost reduction should certainly be considered when hospitalizing these elderly patients with femur and hip fractures. In four SUS hospitals, high adherence by virtually all health services is an excellent stimulant for the implementation of any new procedure; however, low adherence by older anesthesiologists and new anesthesiologists completing their residencies may prevent the project from being extended to all patients. There is a great need for health managers in the Brazilian Health System (SUS) to embrace and implement any new service, especially if it generates savings. My transfer from the private clinic to the SUS reflected the need for the SUS to have the best for its patients.

References

1. Imbelloni LE, Gomes D, Braga RL (2014) Clinical strategies to accelerate recovery after surgery orthopedic femur in elderly patients. Anesth Essays Res 8: 156-161.
2. (2025) IBGE population over 60 years old in Brazil in 2025. Website accessed https://www.ibge.gov.br>estatisticas>sociais>populacao.
3. Ribeiro MCF, Ribeiro MEF, Santos GS (2024) The epidemiological profile of admissions for femur fractures in Brazil from 2019 to 2023. Brazilian Journal of Implantology and Health Sciences 6: 1154-1164.
4. Peterle VCU, Geber JC Jr, Darwin W Jr (2020) Indicators of morbidity and mortality by femur fractures in older people: a decade-long study in Brazilian hospitals. Acta Ortop Bras 28: 142-148.
5. Silva ELD, Abrahão G, Silva G, Luciano AP (2023) Epidemiological profile of hospitalization for femur fractures in elderly people in Brazil between 2013 and 2022. Revista Epidemiologia Saúde Pública-RESP 1: 1-8.
6. Jiang M, Liu S, Deng H (2021) The efficacy and safety of fast track surgery (FTS) in patients after hip fracture surgery: a meta-analysis. Journal of Orthopaedic Surgery and Research 16: 162.
7. Kehlet H, Wilmore DW (2008) Evidence based surgical care and the evolution of fast track surgery. Ann Surg 248: 189 198.
8. White PF, Kehlet H, Neal JM (2007) Fast track surgery study group. The role of the anesthesiologist in fast track surgery: From multimodal analgesia to perioperative medical care. Anesth Analg 104: 1380 1396.
9. Imbelloni LE, Pombo IA, Filho GB (2015) Reduced fasting time improves comfort and satisfaction of elderly patients undergoing anesthesia for hip fracture. Rev Bras Anestesiol 65: 117 123.
10. Imbelloni LE, Morais Filho GB (2016) Attitudes, awareness and barriers regarding evidence based orthopedic surgery between health professionals from a Brazilian Public Health System (SUS) hospital: Study of 400 patients. Anesth Essays Res 10: 546-551.
11. Sabaté E (2023) Adherence to long-term therapies. Evidence for action. World Health Organization 2003. avenue Appia 20, CH-1211 Geneva 27, Switzerland 1-209.
12. Haan E, Rijckevorsel Vajim, Bod P (2023) Delirium afters for proximal femoral fractures in the frail elderly patient: Risk factors and clinical outcomes. Clinical Interventions in Aging 18: 193-203.
13. Baghdadi S, Kiyani M, Kalantar SH (2023) Mortality following proximal femoral fractures in elderly patients: a large retrospective cohort study of incidence and risk factors. BMC Musculoskeletal Disorders 24: 693.
14. Chinachoti T, Nilrat P, Samarnpibllnphol P (2013) Nausea, vomiting and pruritus induced by intrathecal morphine. J Med Assoc Thai 96: 589-594.